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Fish and Wildlife Service
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In Reply Refer To:
File: M19 Helena-Lewis and Clark National Forest
06E11000-2020-F-0519 Helena-Lewis and Clark Forest Plan Revision

January 11, 2022

Sara Mayben, Acting Forest Supervisor
Helena-Lewis and Clark National Forest
2880 Skyway Drive
Helena, Montana 59602

Dear Ms. Mayben:

The U.S. Fish and Wildlife Service (Service) has reviewed the new information received from the Helena-Lewis and Clark National Forest (Forest) regarding the effects of the 2021 Forest Plan. We previously completed formal consultation on the 2021 Forest Plan for grizzly bear, Canada lynx (*Lynx canadensis*), and Canada lynx critical habitat with issuance of a terrestrial biological opinion in February 2021. A concurrence with the no jeopardy determination for whitebark pine (*Pinus albicaulis*) was also provided in the February 2021 document. The Service issued a separate biological opinion for bull trout in October 2021.

Since issuance of the terrestrial biological opinion, the Forest has provided updates and corrections to some data that was previously analyzed via emails and site-specific project consultations. On December 7, 2021, the Service received a supplement to the biological assessment for the 2021 Forest Plan from the Forest that summarizes, in one place, the recent updates along with other corrections and errata that were previously provided. The supplement also provides additional information and clarification to some of the data and analyses provided in the 2020 biological assessment. The information contained in the supplement is in addition to the information provided in the 2020 biological assessment and does not affect nor change the analysis, conclusions, and determinations made in that biological assessment. Upon review of the additional information, the Service has prepared a revised biological opinion for the 2021 Forest Plan.

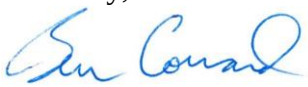
The attached revised biological opinion addresses the effects of the 2021 Forest Plan on the listed grizzly bear, Canada lynx, and lynx critical habitat and is based on information provided in the 2020 biological assessment prepared for the 2021 Forest Plan and additional information received during the consultation and reinitiation of consultation processes, including the 2021 supplement to the biological assessment for the 2021 Forest Plan. The revised biological opinion was prepared in accordance with section 7 of the Endangered Species Act (Act) of 1973, as

amended (16 U.S.C. 1531 et seq.). A biological opinion for bull trout and bull trout critical habitat was issued separately.

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 (proposed). We reviewed the biological assessment related to whitebark pine and we concur with your determination.

Thank you for your continued assistance in the conservation of endangered, threatened, and proposed species. A complete project file of this consultation is on file at the Service's Montana Field Office. If you have questions or comments related to this consultation, please contact Katrina Dixon at katrina_dixon@fws.gov.

Sincerely,



Ben Conard
Acting Office Supervisor

ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

Revised
BIOLOGICAL OPINION

on the

Effects of the Helena-Lewis and Clark National Forest 2021 Forest Plan on Grizzly Bears, Canada Lynx, and Designated Lynx Critical Habitat

Agency:	U.S. Department of Agriculture Forest Service Helena-Lewis and Clark National Forest Helena, Montana
Consultation Conducted by:	U.S. Fish and Wildlife Service Montana Field Office Helena, Montana
Date Issued:	January 11, 2022

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INTRODUCTION

This revised biological opinion was prepared by the U.S. Fish and Wildlife Service (Service) and analyzes the effects of the 2021 Forest Plan for the Helena-Lewis and Clark National Forest (Forest) on grizzly bears (*Ursus arctos horribilis*), Canada lynx (*Lynx canadensis*), and lynx critical habitat. A separate biological opinion was prepared for bull trout (*Salvelinus confluentus*) and bull trout critical habitat. Reinitiation of consultation began in May of 2021, when the Forest first provided additional information to the Service regarding the 2021 Forest Plan. After that date, several updates and/or corrections were provided from the Forest to the Service via email. On December 7, 2021, the Service received a supplement to the 2020 biological assessment (dated December 3, 2021) from the Forest that summarizes, in one place, the recent updates along with other corrections and errata that were previously provided.

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. 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 result in jeopardy or adverse modification of critical habitat, if any has been designated. 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 revised biological opinion addresses only impacts to federally listed species and does not address the overall environmental acceptability of the proposed action.

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 revised programmatic biological opinion, as implemented under the 2021 Forest Plan, being the second tier of consultation. When applicable, some second tier consultations would reference back to this revised programmatic biological opinion to ensure that the effects of specific projects under consultation are commensurate with the effects anticipated in this revised biological opinion and incidental take statement.

Consultation History

Informal consultation on the 2021 Forest Plan began between the Forest and the Service in 2018. On March 13, 2020, we received the final biological assessments and request for consultation on the effects of the 2021 Forest Plan (U.S. Forest Service 2020). Appendix B of the biological assessment displays a record of consultation between the Forest and the Service (*Ibid.*). Further consultation continued through email, meetings, and phone conversations with Forest staff. A terrestrial biological opinion was issued to the Forest on February 10, 2021.

Since issuance of the terrestrial biological opinion, the Forest has provided updates and corrections to some data that was previously analyzed via emails and site-specific project consultations. On December 7, 2021, the Service received a supplement to the biological assessment for the 2021 Forest Plan from the Forest in order to summarize, in one place, the recent updates along with other corrections and errata that were previously provided. The

supplement also provides additional information and clarification to some of the date and analyses provided in the 2020 biological assessment. The information contained in the supplement is in addition to that provided in the 2020 biological assessment and does not affect nor change the analysis, conclusions, and determinations made in that biological assessment. Some of this new information merely corrects previously provided information and is not necessarily associated with additional effects not previously analyzed while other information was more related to the effects analysis provided in the February biological opinion. Accordingly, the Service has updated the relevant sections in this revised biological opinion as well as any other sections as necessary based on new information or errors found. The changes and updates received from the Forest are summarized below:

- The acreages of Recreation Opportunity Spectrum (ROS) and Recommended Wilderness Areas (RWA) were adjusted slightly from those used in the 2020 biological assessment analysis. Those adjustments have resulted in slight changes to acreages reported in several places in the 2020 biological assessment.

- An update to some of the acreages for several activities allowed under the 2021 Forest Plan including timber harvest, timber production, wheeled motorized use, and over-the-snow motor vehicle use;

- Updates and explanations to some of the calculations associated with motorized access in the grizzly bear subunits within the NCDE recovery zone, which result in a change of effects from significant to insignificant within the Red Mountain Subunit. Associated with no longer anticipating adverse effects in this subunit, we also no longer anticipate incidental take in this subunit;

- Updates to the acres within the grizzly bear analysis units GBAUs delineated outside of the recovery zone to include total acres of each GBAU in addition to the acres only on Forest land;

- Updates to the amount of secure habitat in some GBAUs based on recent project-level analyses that have generated updated estimates of secure habitat (updates are not from changes on the ground but as a result of improvements to the data); and

- An update to the acres of proposed recommended wilderness areas.

Upon review of the additional information, the Service has prepared a revised biological opinion for the 2021 Forest Plan. The biological assessment, supplement to 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 revised biological opinion. A complete project file of this consultation is on file at our office.

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the revision of the Forest's land management plan. The 2021 Forest Plan is the land use planning level guidance document for the Forest, providing direction for project and activity decision making. The 2021 Forest Plan provides an integrated plan for land and

resource management, which articulates desired conditions, goals, objectives, standards, guidelines, and suitability of lands. For specific information on the 2021 Forest Plan direction, refer to pages 4 through 13 of the terrestrial biological assessment (U.S. Forest Service 2020). The 2021 Forest 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 2021 Forest Plan, will be addressed in subsequent section 7 consultations, as appropriate. Types of activities subsequently authorized, funded, or carried out under the 2021 Forest Plan that may affect listed species and/or designated critical habitat are described in the biological assessments prepared for the 2021 Forest Plan, which are hereby incorporated by reference (U.S. Forest Service 2020). The Forest estimates that the life of the 2021 Forest Plan will be approximately 15 years.

For the analysis below, it is important to provide the definitions for standards and guidelines that occur within the 2021 Forest Plan. A standard (STD) is a mandatory constraint on project and activity decision-making, established to help achieve or maintain one or more desired conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (*ibid*.). Standards must be met and cannot be deviated from. A guideline (GDL) 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 one or more desired conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (*ibid*.). The 2012 planning rule allows the Forest to deviate from guidelines so long as they meet the purpose of the guidelines. However, since it is not known at this time what other scenarios may be used to meet the purpose of the guidelines within the 2021 Forest Plan, these guidelines, as written, will be used for the effects analysis. If the purpose of the guidelines are met in a different way than as written, the potential effects of such might not be addressed in this revised biological opinion and site-specific consultation may be necessary depending on the site-specific information and effects.

I. GRIZZLY BEAR

STATUS OF THE SPECIES

No critical habitat has been designated for grizzly bears. For information on the status of grizzly bears, including species description, life history, and status and distribution, refer to the Grizzly Bear Recovery Plan (U.S. Fish and Wildlife Service 1993), the grizzly bear 5-year status review (U.S. Fish and Wildlife Service 2021a), the species status assessment (SSA) for grizzly bears (U.S. Fish and Wildlife Service 2021b), the grizzly bear recovery program 2020 annual report (U.S. Fish and Wildlife Service 2021c), the conservation strategy for the grizzly bear in the Northern Continental Divide Ecosystem (NCDE subcommittee 2020), Grizzly bear demographics in the NCDE (Costello et al. 2016), NCDE grizzly bear population monitoring team 2020 annual report (Costello and Roberts 2021), the Greater Yellowstone Ecosystem conservation strategy (U.S. Fish and Wildlife Service 2016), the Yellowstone Grizzly Bear Investigations 2019 (van Manen et al. 2020), 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. 2021a), 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. 2021b). These documents (referenced here), include the best available science regarding the status and distribution of grizzly bears and are incorporated by reference.

Analysis of the Species Likely to be Affected

The biological assessment determined that the 2021 Forest Plan would likely adversely affect individual grizzly bears. Therefore, formal consultation with the Service was initiated and this revised biological opinion has been written to determine whether or not activities associated with this action are likely to jeopardize the continued existence of grizzly bears. Grizzly bears are listed as threatened under the Act. Critical habitat has not been designated for this species, therefore none would be affected by the proposed action.

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 action area for the analysis of effects of the 2021 Forest Plan includes the approximately 2,846,606 acres of Forest land within the administrative boundaries of the Forest. The action area also includes slightly more than 30,000 acres of Beaverhead-Deerlodge National Forest that is administered by the Forest as well as slightly more than 2,000 acres of Forest lands in isolated parcels outside of the administrative boundaries. 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. The Forest includes portions of 17 counties and is managed as 8 ranger districts including the Rocky Mountain, Lincoln, Helena, Townsend, White Sulphur Springs, Belt Creek, Judith, and Musselshell Ranger Districts.

The Forest straddles the continental divide and includes several island mountain ranges. Because of its diversity and extent, and because the island mountain ranges include unique ecological and social context, the action area is divided into 10 geographic areas (GAs). Some plan components in the 2021 Forest Plan are unique to individual GAs. Figure 1 and Table 2 in the terrestrial biological assessment display the GAs spatially and provide the acreages by ownership (U.S. Forest Service 2020).

In order to facilitate a consistent effects analysis approach for grizzly bears throughout the Forest, the Forest further divided the GAs into grizzly bear analysis units (GBAUs), with the

exception of the already delineated subunits within the recovery zone. While the existing condition (the existing Forest Plans) was not previously analyzed in this manner, it was analyzed here in order to look at both the effects of the existing condition as well as the effects under the 2021 Forest Plan consistently. GBAUs were delineated by using hydrologic boundaries that were adjusted (generally combined all or in part) based on average female home range size, topography, range of habitat types, range of elevations, and presence of private lands (U.S. Forest Service 2020).

Status of the Species within the Action Area

The action area is located in portions of the NCDE recovery zone, and NCDE zones 1, 2, and 3. The Rocky Mountain Range GA and the northern half of the Upper Blackfoot GA are within the recovery zone. The southern half of the Upper Blackfoot GA (158, 047 acres) and 325 acres in the Divide GA are within NCDE zone 1. A portion of the Upper Blackfoot GA (1,017 acres), along with the remainder of the Divide GA, and all of the Elkhorns GA and the Big Belts GA are located within NCDE zone 2. The Little Belts GA is located within NCDE zone 3. Grizzly bears may be present throughout most of the Forest, with the exception of the Snowies, Crazies, and Castles, portions of the Little Belts GA, and a small portion of the Big Belts GA that lies south of U.S. Highway 12.

While the number of grizzly bears using the action area is unknown, the likelihood of occurrence is expected to be high within the NCDE recovery zone and NCDE zone 1. Grizzly bear numbers are likely lower within NCDE zone 2 but grizzly bears may be present within most portions of NCDE zone 2, especially in those areas west of Interstate 15. At this time, numbers are likely low to very low within NCDE zone 2 east of Interstate 15 and NCDE zone 3, where numbers are expected to increase relatively slowly over time. This is especially true for female grizzly bears. As described in Proctor et al. (2012), males move more frequently and over longer distances than females. Males have large home ranges and establish home ranges nearly three times further away from their mother's home ranges than do female offspring. Females usually establish smaller home ranges than males that overlap with their mother's home range (Waser and Jones 1983; Schwartz et al. 2003). In doing so, they generally disperse over much shorter distances than male grizzly bears (McLellan and Hovey 2001; Proctor et al. 2004). Therefore, female dispersal is a multi-generational process where females must live year-round in an area, successfully reproduce, and offspring disperse into adjacent, unoccupied habitat. Thus, female grizzly bear presence in portions of the action area is likely to increase slowly over time.

Factors Affecting Species Environment within the Action Area

This section identifies and describes key areas of the existing Forest Plan management that affect the grizzly bears' environment. These factors include access management, food and attractant management and developed sites, livestock management, vegetation and fire management, and energy and mineral development. 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). General impacts of these factors will be discussed in more detail in the '*Effects of the Action'* section below.

Access Management

Motorized access has long been recognized as a major factor affecting grizzly bears (see section below, '*General Effects of Roads on Grizzly Bears'*). Some portions of the action area are highly roaded while other portions have low road densities. With the exception of the subunits within the recovery zone, we have previously analyzed portions of the action area using only linear motorized route density or an estimate of low, medium, or high levels of motorized use. Providing the linear route density gives an idea of the amount of roads in the action area, however it does not represent how these routes occur on the landscape. Although road density provides a useful threshold to describe human-caused effects to grizzly bears based on existing literature, road density alone fails to consider how road placement affects habitat patch size (Proctor et al. 2019). For example, portions of the GBAUs may have high route densities (even within the GBAUs with lower overall linear route densities) while other portions of the GBAUs may have low route densities or even no motorized routes (even within the GBAUs with higher overall linear route densities). For instance, even in a GBAU with overall low road density, there may be patches of high road density interspersed with patches of low road density or even unroaded areas.

Secure habitat has been identified as one of the key issues related to effects of motorized access on grizzly bears and is important to the survival and reproductive success of grizzly bears. In a comprehensive review of research into the relationships between motorized access and grizzly bears, Proctor and others (2018) cited research findings (e.g. Nielsen et al. 2004, Proctor et al. 2017) indicating that distance to roads and location of roads in relation to certain habitats may be as or more important than road density in predicting impacts to bears. Proctor et al. (2018) also noted that the spatial arrangement of motorized routes and security areas may be critically important in terms of the degree to which bears may be affected by motorized access. In other words, the key to limiting impacts of roads on bears is tied to availability, location, and distribution of secure habitat that is a function of not simply numeric density of motorized routes, but the spatial arrangement in which they occur.

While secure habitat is directly tied to and based on open and restricted motorized routes, it more adequately represents the potential effects to grizzly bears related to motorized access as it provides a more accurate indication of the spatial mix of motorized routes and secure habitat. For example, measurements of road density in situations of uniformly spaced roads, even at an otherwise acceptable road density, can provide very limited patches of secure habitat that are functionally useful for grizzly bears (Proctor et al. 2019). Similarly, large patches of important habitat may be available in areas with high road densities if roads are concentrated in specific areas. Accordingly, we have incorporated secure habitat into this analysis.

Several methods exist for defining secure habitat relative to distances from roads and/or other human disturbance. Although the concept and benefits of secure habitat has been well documented (Mace et al. 1996, Wakkinen and Kasworm 1997, Gibeau et al. 2001, Schwartz et al. 2010), science has not provided a clear definition of the specific metrics for defining secure habitat. Each delineation of secure habitat is based on the intended use and relevant information for the location it is applied. The IGBC (IGBC 1998) reviewed four studies indicating a range of avoidance of roads in four disparate locations and recommended a distance of 500 meters (0.31

mile) from roads as the minimum distance to define secure habitat. The 500 meter distance has become the most universal distance for delineating secure habitat.

All habitat greater than 500 meters from motorized routes can provide areas free of motorized access related disturbance and provide security for grizzly bears. Depending on the juxtaposition to other patches of secure habitat or other resources, even small patches of habitat more than 500 meters from motorized routes may provide valuable space for grizzly bears to avoid human disturbance, move between important food resources, and/or can be utilized for long-distance connectivity.

Within the action area, secure core within the recovery zone is managed differently than secure habitat outside of the recovery zone. Therefore, it is important to distinguish the terminology associated with such habitat. Within the subunits of the recovery zone, areas more than 500 meters from an open or gated motorized route and greater than 2,500 acres in size are defined as 'secure core'. Whereas, areas more than 500 meters from any motorized route and greater than 2,500 acres in size that are located outside of the recovery zone are defined as 'secure habitat'. While patches of habitat less than 2,500 acres can provide security for grizzly bears, at the programmatic scale of this revised biological opinion on the 2021 Forest Plan we consider the areas on the Forest that are greater than 2,500 acres in size (located more than 500 meters from motorized routes) as secure core or secure habitat that we will measure. Site-specific, project-level analyses will capture the potential smaller areas of secure habitat.

Management of motorized access is effective in minimizing the effects of motorized access on grizzly bears (Proctor 2019). In 2018, the Forest amended their plans to incorporate management criteria from the NCDE grizzly bear conservation strategy (NCDE grizzly bear amendments). In general, the NCDE grizzly bear amendments stipulated that within the recovery zone (also referred to as the Primary conservation area or PCA) no net increase in open motorized route density (OMRD) and total motorized route density (TMRD) would occur above the 2011 motorized access baseline conditions and no net decrease in secure core would occur below the 2011 motorized access baseline conditions. Some exceptions under certain conditions do exist, as detailed in the NCDE grizzly bear amendments and conservation strategy. For example, the NCDE grizzly bear amendments allow temporary effects to the 2011 baseline for temporary activities or projects. Temporary route construction and use would not affect the overall 2011 baseline measurement. Permanent changes in OMRD, TMRD, or secure core may occur due to improved data, unforeseen circumstances, natural events, or other reasonable considerations. Such changes may adjust the baseline values but will not be considered a violation of the motorized access management habitat objectives described in the NCDE conservation strategy (NCDE Subcommittee 2020) and will not require mitigation responses. Acceptable changes that may adjust baseline conditions, as well as a detailed list of application rules for motorized access on federal lands can be found in the 2020 conservation strategy (*Ibid.*), which is incorporated by reference.

The existing motorized access conditions for the recovery zone portion of the action area are displayed in Table 1 by subunit and reflect the most recent information. The metrics have been updated for the three subunits in the Upper Blackfoot GA (Alice Creek, Arrastra Mountain, and Red Mountain) as of April 14, 2021. Since issuance of the February biological opinion on the 2021 Forest Plan, the Forest and Service have realized that an error was made in the analysis for the Blackfoot Non-winter Travel Plan when calculating TMRD for the Arrastra Mountain

subunit. The metrics reported in the biological assessment for the Arrastra Mountain subunit were previously calculated using a method inconsistent with the standard method used throughout the NCDE to calculate OMRD, TMRD, and Core. When calculating TMRD, the Copper Bowls extended use area (late season snowmobile use) was included into the calculations. However, as explained in the biological opinion on the Blackfoot Winter Travel Plan, only open roads are used to access the extended use area and only secure core is temporarily affected (U.S. Fish and Wildlife Service 2010). No restricted roads will be used to access this extended use area. Thus, TMRD is not affected by the Copper Bowls extended use area and should not have been reflected in the TMRD metric. These metrics have since been corrected (U.S. Forest Service 2021). The corrected numbers were provided to the Service in July 2020 via email and reflected full (completed) implementation of the Blackfoot Non-Winter Travel Plan, which has not yet been fully implemented but is considered as baseline under section 7. However, to more accurately report the existing condition on-the-ground (as the Blackfoot Non-Winter Travel Plan has not yet been fully implemented) Table 1 below displays the on-the-ground condition at this time, which will improve over time upon completion of the Blackfoot Non-Winter Travel Plan. Table 5a in the supplement to the biological assessment both corrects and supplements Table 5 in the biological assessment.

Table 1. Existing OMRD, TMRD, and Secure Core within the NCDE recovery zone portion of the action area (U.S. Forest Service 2020, U.S. Forest Service 2021).

Subunit[1]	OMRD[2]	TMRD[3]	Secure Core[4]
Badger*	0	0	73
Heart Butte*	1	0	61
Two Medicine*	2	1	78
Birch*	0	0	93
Teton*	11	5	71
Falls Creek*	0	0	85
Scapegoat*	5	1	78
Lick Rock	0	0	100
Roule Biggs	0	0	100
South Fork Willow	14	3	81
West Fork Beaver	17	5	80
Deep Creek*	9	3	67
Pine Butte*	7	2	64
Alice Creek*	11	12	73
Arrastra Mountain	15	17	76
Red Mountain	18	17	70

[1]Subunits with an asterisk next to their name are less than 75 percent Forest ownership
[2]OMRD is the percent of the subunit with open motorized routed densities exceeding 1 mile per square mile
[3]TMRD is the percent of the subunit with total motorized routed densities exceeding 2 miles per square mile
[4]Secure core is the percent of the subunit functioning as secure core habitat, excluding acreage of large lakes and small private lands.

Within the recovery zone, research benchmarks for OMRD, TMRD, and secure core describe that adverse effects to grizzly bears are likely to occur when OMRD exceeds 1 mile per square mile in more than 19 percent of the subunit, TMRD exceeds 2 miles per square mile in more than 19 percent of the subunit, and secure core is not at least 68 percent of the subunit during the non-denning period. This road-density threshold, first identified by Mace et al. (1996) has been

roughly observed by other researchers in multiple study areas (summarized in Proctor et al. 2019) as being a density beyond which adverse effects to female grizzly bears can occur. Table 1 displays that all of the subunits meet these conditions related to OMRD and TMRD. Three of the subunits have less than 68 percent functioning as secure core (Heart Butte, Deep Creek, and Pine Butte). However, these subunits are less than 75 percent Forest ownership and the lower amounts of secure core within the subunit are a result of motorized access on non-Forest land. The amount of motorized access that occurs on Forest lands is very low in these three subunits and the ongoing effects from motorized access associated with the Forest would be insignificant within these subunits. As all other subunits are better than the research benchmarks for OMRD, TMRD, and Secure Core, the ongoing effects associated with the existing motorized access conditions within the recovery zone would be insignificant to grizzly bears.

The 2018 grizzly bear amendment to the Forest Plan requires that open motorized route density on the Forest's portion of NCDE zone 1, measured as linear miles over the entire area (referred to as "linear motorized route density"), does not to increase above the 2011 baseline unless adjusted through consultation. Table 5b of the supplement to the biological assessment provides information on the existing calculated linear motorized route density in NCDE zone 1 since the original 2011 baseline was identified in the NCDE Conservation Strategy. This is also the time period in which implementation of the Blackfoot Non-Winter Travel Plan has been ongoing. The original baseline linear motorized route density for Forest routes from the 2011 NCDE Grizzly Bear Conservation Strategy was 1.6 miles per square mile. The 2015 and 2017 NCDE motorized access monitoring reports displayed the linear motorized route density for Forest routes as 1.2 miles per square mile. The 2017 biological opinion on the grizzly bear amendment to the Forest Plan displayed the linear motorized route density for Forest routes as 1.3 miles per square mile. The 2019 NCDE motorized access monitoring report displayed the linear motorized route density for Forest routes as 1.0 miles per square mile. Finally, the most recent biological opinion on the Forest within NCDE zone 1 (for the Hogum Project) displayed the linear motorized route density for Forest routes as 1.3 miles per square mile.

The linear motorized route densities displayed for the Forest's portion of NCDE zone 1 differ for several reasons (U.S. Forest Service 2021). First, they reflect actual changes on-the-ground as implementation of the Blackfoot Non-Winter Travel Plan progresses. Second, the motorized route information database (INFRA) is incomplete, as noted in the biological assessment for the 2021 Forest Plan. For the purposes of linear motorized route density analyses, biologists and analysts may use various methods to determine whether certain roads that are lacking formal data are open or effectively closed. Those methods may include such things as field validation, use of remote imagery, staff knowledge, etc., and may vary depending on timing of analysis and availability of information sources. Where appropriate, road status determinations made during project-level analyses are entered into the INFRA database. Not all determinations are appropriate for entry into INFRA, however, as some may require further validation. Nevertheless, biologists and analysts use the best information available at the time each analysis is completed. The Forest is engaged in an ongoing process to update the INFRA database and improve availability of the information required for linear motorized route density analyses. The 2019 monitoring report was completed to measure compliance with the 2018 grizzly bear amendments, and it reflects the most up-to-date information available at the time. The density reported for the Hogum Project was calculated specifically for that analysis and differs from the 2019 monitoring report for the reasons stated above (e.g., additional field evaluation). With each of these methods, it is important to note that the requirement that the linear motorized route density

is not to increase above the 2011 baseline has been met and the conditions are better than the 2011 baseline conditions.

The NCDE grizzly bear amendments do not require motorized access management in NCDE zones 2 and 3. As the measures under the NCDE grizzly bear amendments are also included within the 2021 Forest Plan, the 2017 consultation on the NCDE grizzly bear amendments to the Helena and Lewis and Clark National Forests are superseded by this consultation on the 2021 Forest Plan.

The existing amount of secure habitat within NCDE zones 1, 2, and 3 is displayed in Table 2 by GBAU, rounded to the nearest whole number. Due to some concerns with the access data in portions of the action area outside of the recovery zone and in order to be conservative when analyzing effects, all existing routes are buffered, regardless of whether they are legally open or restricted to public travel, when delineating secure habitat outside of the recovery zone. As such, the estimates of secure habitat displayed in Table 2 below are in most cases underestimates of actual secure habitat that exists on the ground because an unknown number of routes that are physically impassable to motor vehicle use have not been updated within the access database and thus, were excluded from secure habitat polygons. Accordingly, the secure habitat amounts provided are useful mainly as a broad index of what may be available to grizzly bears that may use the action area outside of the recovery zone. The Forest is expected to update the secure habitat metrics as they update their access data during site-specific project planning in order to more accurately portray what is existing on the ground at the time of this consultation. Since secure habitat was likely underestimated, it is likely that updates to the amount of secure habitat in GBAUs would either not change or would increase.

In addition, since the Forest has no management authority over non-Forest lands, lands not administered by the Forest were also buffered out of the secure habitat analysis. While it is possible that non-Forest land may provide secure habitat, such information is often unknown and the Forest lacks management authority over non-Forest lands. Thus, to be conservative when analyzing effects to grizzly bears, so as to not miss any potential effects, non-Forest land is buffered out of the secure habitat metric and the secure habitat analysis includes only secure habitat on Forest land. Depending on the juxtaposition to other patches of secure habitat or other resources, smaller patches (less than 2,500 acres) of habitat more than 500 meters from motorized routes may provide security and valuable space for grizzly bears to avoid human disturbance, move between important food resources, and/or can be utilized for long-distance connectivity. While patches of habitat less than 2,500 acres can provide security for grizzly bears, we consider the areas on the Forest that are greater than 2,500 acres in size (located more than 500 meters from motorized routes) as secure habitat that we will measure.

Road densities outside the recovery zone are typically higher due to their proximity to human population centers, varied ownerships, and a long history of various human uses. As such, the amount of secure habitat is typically much lower than within the recovery zone. As displayed in Table 2, the amount of secure habitat varies greatly among GBAUs with a range from a low of 4 percent to a high of 62 percent. As previously mentioned, the amount of secure habitat also varies within a GBAU, with higher amounts in some portions and lower amounts in others. Thus, it is likely that existing motorized access conditions within all of the GBAUs may be resulting in some level of ongoing significant effects to grizzly bears, depending on site-specific information such as location and grizzly bear presence.

Table 2. Estimated existing secure habitat within the action area outside of the NCDE recovery zone (U.S. Forest Service 2020, U.S. Forest Service 2021).

GBAU	GBAU Total Acres	Total Acres of Forest Lands in GBAU (percent of GBAU)	Acres of Secure Habitat (Percent of GBAU/Percent of Forest land in GBAU)	Number of Areas of Potential Secure Habitat[1]
Dalton Mountain	85,574	82,277 (96%)	31,892 (37%/39%)	2
Humbug	72,797	66,966 (92%)	30,555 (42%/46%)	2
Boulder River BDNF	33,523	30,973 (92%)	13,023 (39%/42%)	1
Casey Peak	68,181	60,455 (89%)	35,069 (51%/58%)	2
Crow Creek	73,514	69,822 (95%)	29,679 (40%/43%)	2
Lazyman	77,205	64,416 (83%)	11,891 (15%/18%)	2
North Divide	163,457	72,196 (44%)	16,484 (10%/23%)	2
Spotted Dog	74,673	66,723 (89%)	18,942 (25%/28%)	2
Middle Big Belts	83,704	70,744 (85%)	25,908 (31%/37%)	1
North Big Belts	215,830	171,431 (79%)	77,899 (36%/45%)	5
South Big Belts	126,333	67,119 (53%)	20,019 (16%/30%)	2
Dry Wolf	79,470	74,308 (94%)	26,394 (33%/36%)	3
Elephant	205,009	199,743 (97%)	48,705 (24%/24%)	10
Pilgram	83,786	72,942 (87%)	40,168 (48%/55%)	2
Middle Fork Judith	112,817	110,602 (98%)	67,089 (59%/61%)	2
Sheep Creek	169,900	127,730 (75%)	5,006 (3%/4%)	1
Tenderfoot-Smith	130,059	113,449 (87%)	58,612 (45%/52%)	2
Upper Belt Creek	117,741	103,762 (88%)	33,302 (28%/32%)	6
Highwoods	44,466	42,291 (95%)	26,368 (59%/62%)	3
Castles	79,916	69,709 (87%)	7,325 (9%/11%)	2
Crazies HLC	70,092	57,667 (82%)	22,154 (32%/38%)	1

[1]Patch size greater than 2,500 acres. Some patches of secure habitat cross GBAU boundaries and may be counted in both GBAUs.

Some routes within the action area are defined as undetermined. Undetermined routes include old roads used for past land management activities that still remain on the landscape and user-created roads that have generally been developed without agency authorization, environmental analysis, or public involvement. Accordingly, undetermined routes are not considered an open route and are not part of the Forest's road system. Public motorized use is confined to routes identified on the Forest's motor vehicle use maps, which do not include undetermined routes. In many cases, undetermined routes have existed for many years, and thus are part of the environmental baseline from which grizzly bears have been experiencing effects. Thus, while documenting undetermined routes offer a more accurate representation of the conditions on the ground, it does not necessarily represent new effects to grizzly bears.

The disposition of undetermined routes is generally determined through travel planning. During those efforts, some undetermined routes are designated as part of the National Forest road or trail system while the remaining ones are generally slated for some type of decommissioning. Some undetermined routes are left on the landscape because they have been naturally reclaimed and no longer cause resource impacts. It can be several years before all of the undetermined routes have

been decommissioned or grown in. Travel planning efforts may not identify all of the undetermined routes in a travel plan area or new undetermined routes may have been created or found since the completion of the respective travel planning process. The disposition of such undetermined routes are generally addressed through subsequent project decisions. At times, some of these undetermined routes are used for site-specific project activities. The use and subsequent disposition of such routes would be part of the site-specific project action and associated site-specific analysis. Undetermined routes that are discovered may also be addressed on their own if they present imminent resource concerns.

Relative to the grizzly bear secure habitat discussed above, not all of the undetermined routes that occur on the Forest reside in the Forest's corporate road database (INFRA), which was used to determine secure habitat for the 2021 Forest Plan biological assessment and supplement. Updates to INFRA due to more recent information are sporadic. When entering an area of the Forest for site-specific project planning, the Forest may discover routes that were not previously known, mapped, or documented in INFRA. If the Forest documents an undetermined route during site-specific analyses, they should determine whether it existed prior to the existing baseline condition described above or whether it is new information in addition to the existing baseline condition described above. The supplement to the biological assessment for the 2021 Forest Plan included updated information from site-specific project analyses that have occurred since issuance of the 2021 Forest Plan biological assessment. This updated information reflects updated route information, including known undetermined routes not previously identified, if applicable.

A private entity's non-compliance with the Forest's access management is an illegal activity. While illegal use of the Forest (action area) via motorized access in areas unauthorized for such use may occur within the action area, such illegal use is 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, and/or carried out*, in whole or in part, by Federal agencies in the United States or upon the high seas (emphasis added). These and any other illegal activities are not the result of a federal action and therefore not analyzed under effects of the action, but their influence is considered for describing the environmental baseline.

Illegal motorized access could occur anywhere on the Forest. The Forest, including Forest staff and law enforcement, monitors road closures for violations and enforces closures to the extent practicable given the resources available. Violations on the Forest have involved damage to gates or locks, driving around closure devices, and driving off-road. When gates are breached through cut locks or gate destruction, the Forest remedies the situation through repair or replacement as soon as possible after being made aware of the violation. Skirting or driving around gates often occurs in open country where little to no obstructions exist on either side of the gated road. In these situations, the Forest has built fence or placed boulders alongside the gate to discourage this type of use.

The Forest has previously had some chronic violations in the past. These violations have primarily occurred in areas that are more open such as the north end of Big Belts or in areas where violators can skirt gates, including a few locations in the Strawberry Butte area of the Elkhorn Mountains. In those situations, the Forest has built fence or has placed boulders out from the gate as far as is needed to cut off the opportunity to skirt the gate. In some scenarios,

the Forest has bolstered their surveillance. Most incidents have been isolated and short term. At the time of this revised biological opinion, the Forest does not currently have any known, recurring illegal use. Given the Forest's efforts to curtail illegal use and the ongoing monitoring and maintenance of closures, the level of illegal motorized use of restricted roads is expected to be minimal.

The illegal motorized access situations on the Forest are typical of what would be expected for a National Forest in Montana. The Forest and Service recognize that illegal use is always possible and that the Forest handles these situations by making repairs as soon as possible, to discourage recurring violations. Even with ongoing efforts, some individuals may continue to break the law and illegally access parts of the Forest. The Forest's efforts as described minimize areas of chronic and recurring use to the extent possible. Given the Forest's efforts to curtail illegal use and the ongoing monitoring and maintenance of closures, the level of illegal motorized use of restricted roads in the action area (the Forest) is expected to be minimal.

While illegal motorized access on the Forest has the potential to affect individual grizzly bears, the amount, location, duration, and timing of effects resulting from such illegal use is not typically known. 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. Nonetheless, illegal motorized access is expected to be spatially disparate and temporary and is not likely to collectively cause an adverse effect because most Forest 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.

Moreover, when the Forest implements road restrictions, they typically (but not always (e.g. signage)) use closure devices or methods recognized by the IGBC (IGBC 1998) as effective to restrict motorized access. Accordingly, we assume that, when used, these IGBC recognized closure devices will be effective as it is not the intent or purpose of the Forest to implement closure devices recognized by the IGBC that are ineffective.

Because all routes are considered the same (whether open or restricted) for calculating secure habitat for grizzly bears, illegal motorized use of restricted routes does not affect secure habitat. Secure habitat could only be affected by illegal motorized access with off-road use or use of reclaimed/obliterated or bermed roads (which are no longer considered roads for the purposes of calculating grizzly bear secure habitat or motorized route miles/densities) that occur within secure habitat. Although the effects of illegal motorized access are considered in the baseline for the proposed action, a change to the metrics used by the Forest to assess baseline access conditions under the authority of the Forest would not occur as such use was not authorized, carried out, or funded by the Forest. Also, illegal motorized access would most likely result in short-term, temporary effects to grizzly bears as opposed to a permanent change in motorized access conditions because the Forest corrects the situation as soon as they are able. The timing for corrections may vary depending on seasonal and/or weather conditions and the type of correction needed (for example corrections may range from replacing a broken lock to replacing a broken gate or fixing a barrier, to redesigning and/or constructing a new barrier).

While effects to grizzly bears may occur as a result of illegal motorized access on the Forest, it is the Service's opinion that such effects are reasonably uncertain. Information as to the length,

duration, amount of illegal use, type of use, and location, among other conditions, is and will continue to be unknown. As such, the Service and the Forest are not able to calculate the extent of effects to individual grizzly bears. However, it is our opinion that the effects of any illegal motorized access on the grizzly bear population is likely low as evidenced by the NCDE grizzly bear population status, including an increasing number of grizzly bears, an expansion of the distribution of grizzly bears, and an estimated positive population trend. Because illegal motorized use is not considered a federal action, any effects associated with illegal motorized access are not exempted under this revised biological opinion.

The action area includes several designations, such as congressionally-designated wilderness areas, wilderness study act areas, inventoried roadless areas, conservation management area, and recommended wilderness areas, which limit or restrict human activities including motorized travel. These areas provide some level of habitat security for grizzly bears by prohibiting or largely restricting motorized and mechanized travel and by limiting other activities such as timber harvest, development of recreation sites, and others. Approximately 56 percent of the recovery zone portion of the action area is within designated wilderness. Seven subunits are entirely within designated wilderness, inventoried roadless area, conservation management area, or a combination of these. Table 7 in the biological assessment displays the amount of designated wilderness, wilderness study areas, and inventoried roadless areas by GBAU outside of the recovery zone (U.S. Forest Service 2020).

Winter Motorized Use

Under the existing condition, more than half (approximately 56 percent) of the action area within the recovery zone is within designated wilderness, where over-the-snow motorized travel is prohibited. Within the Rocky Mountain Range GA, winter motorized travel is authorized only on main access roads (none of which are within modeled grizzly bear denning habitat) and approximately 30,000 acres (approximately 8,000 acres overlap with modeled denning habitat). Thus, the authorized snowmobile use within denning habitat in the Rocky Mountain Range GA is limited to relatively small portions of four subunits (Teton, Pine Butte, West Fork Beaver, and South Fork Willow). Snowmobile use within the Rocky Mountain Range GA is prohibited after March 31.

Within the Upper Blackfoot GA, authorized snowmobiling is allowed on about 53,000 acres (approximately 6,400 acres overlap with modeled denning habitat) within the recovery zone. This snowmobile use occurs within all three subunits within the Upper Blackfoot GA (Alice Creek, Arrastra, and Red Mountain). Snowmobile use within the recovery zone portion of the Upper Blackfoot GA is prohibited after March 31 with the exception of the Copper Bowls play area where snowmobile use is allowed until May 31. The Copper Bowls play area does not affect OMARD because the access to this area is on a yearlong open road. No restricted roads are used to access this extended use area. Within the Copper Bowls extended use area, 1,891 acres are designated as secure core, consequently affecting secure core during the non-denning period. Although these 1,891 acres of secure core in the Copper Bowls extended use area may be compromised for a short period of time (from April 1 up to May 31), they remain designated as secure core and will continue to provide secure core during the remainder of the non-denning period.

The NCDE grizzly bear amendments included a plan component to cap the amount of area available to motorized over-snow travel in modeled denning habitat within the PCA (recovery zone) during the den emergence period. No net increase in the percentage of area or miles of routes designated for motorized over-snow vehicle use is to occur on Forest lands during the den emergence time period. Within the remaining portions of the Upper Blackfoot GA outside of the recovery zone, areas north of Highway 200 (specifically within portions of the Dalton Mountain GBAU) are open to snowmobiling through March 31 on approximately 1,800 acres. This use overlaps within approximately 4 acres of modeled denning habitat. Elsewhere in the Upper Blackfoot GA, areas south of Highway 200 (including portions of Dalton Mountain and Humbug GBAUs) are open to snowmobiling through April 15 on approximately 70,000 acres; roughly 7,600 of those acres overlap modeled denning habitat.

For the GBAUs across the remaining portions of the Forest, the dates during which over-snow motorized travel is authorized vary from yearlong to ending on May 15. Snowmobile use that extends beyond March 31 overlaps with approximately 112,535 acres of modeled denning habitat. Many areas on the Forest are relatively dry and snow can be intermittently present. Thus, not all areas legally open to over-snow motorized travel are actually available during the entire time they are open.

Food and Attractant Management and Site Development

A special order (food storage order) requiring food, garbage, and other attractants to be stored in a manner that is unavailable to bears has been in place on the Rocky Mountain Range GA since at least 1987 and on the recovery zone portion of the Upper Blackfoot GA since at least 1993. These food storage orders have been updated several times, most recently in 2010. In 2018, the Forest began implementing Forest-wide food storage orders that apply in all GAs that were not already included in an existing food storage order. Enforcement of the food storage orders has been ongoing for many years within the Rocky Mountain Range and Upper Blackfoot GAs. Implementation of the food storage order elsewhere on the Forest included a major information/education effort during the first year (beginning in 2018) and is subsequently focused increasingly on enforcement.

Developed recreation sites are sites or facilities with features that are intended to accommodate public use and recreation, such as campgrounds, trailheads, rental or permit cabins, lodges, ski areas, fire lookouts, and others. Developed sites on public lands are associated with frequent and/or prolonged human use that may include continuous or frequent presence of food and attractants. The Forest has a total of 215 developed recreation sites (not including permitted cabins and lodges) spread across the action area, including but not limited to boating access points, interpretive pullouts, campgrounds, and trailheads. Of these, a total of 21 developed recreation sites that allow overnight use (rental cabins, campgrounds) occur on the Forest within the recovery zone, along with 99 permitted recreation residence cabins and 4 permitted commercial lodges. The NCDE grizzly bear amendments include limits within the recovery zone on the number and capacity of developed sites that are available to the public for overnight use. All users of any developed recreation site throughout the action area are required to adhere to the food storage orders.

Since implementation of the first food storage order, only one known instance of a management removal or death of a grizzly bear due to improperly stored attractants has occurred on the

Forest. A grizzly bear on the Rocky Mountain ranger district got into improperly/illegally stored horse feed at a hunting camp in late 1999, and subsequently caused damage to several hunting camps and Forest tack sheds in the area. Attempts to trap the bear that year were unsuccessful. The same bear broke into the Green Fork administrative cabin in the Scapegoat Wilderness the following year (fall 2000) and was trapped and euthanized.

Recreation settings are categorized into six Recreation Opportunity Spectrum (ROS) classes ranging from 'primitive' (e.g., designated wilderness, recommended wilderness areas, and others) to 'rural' (e.g., areas immediately adjacent to small communities or private land inholdings, and others), to 'urban'. ROS categories provide some indication of the overall amount of area in which general types of recreation are allowed and can be useful in describing the general settings created by implementation of the existing Forest Plan. Table 4 in the supplement to the biological assessment displays the acreage of ROS classifications, (U.S. Forest Service 2021).

Livestock Management

The Forest has 240 active grazing allotments. Table 3 displays these allotments by GA. Specific numbers of animals grazing on any given allotment, along with timing and duration of use, are established annually in Annual Operation Plans and vary from year to year. Annual Operation Plans must comply with regulations in the Forest Plan direction, and are based on a permittee needs, range condition, and other resource considerations.

No documented grizzly bear mortalities associated with livestock have occurred within the action area. Although no grizzly bear mortalities are associated with livestock grazing on the Forest, the NCDE grizzly bear amendments focus on reducing the potential for impacts to grizzly bears within the recovery zone and NCDE zone 1 via the reduction in the risk of bear-human conflicts, requiring reporting of livestock carcasses, and capping the number of active cattle allotments. The NCDE grizzly bear amendments also include standards to cap animal-unit months on sheep grazing permits returning to use from non-use status in the recovery zone, capping the number of active sheep grazing allotments and sheep animal unit-months in the recovery zone and NCDE zone 1, and limiting the use of temporary small livestock grazing permits in the recovery zone and NCDE zone 1 for purposed such as weed control. It is also recommended that the Forest reduce the number of active sheep allotments in the recovery zone if the opportunity arises. There are currently 5 active sheep allotments on the Forest with 3 in the Upper Blackfoot GA (within both the recovery zone and NCDE zone 1) and 2 in the Big Belts (within NCDE zone 2).

Table 3. Acreage of livestock grazing allotments by geographic area (U.S. Forest Service 2020).

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

[1]Acreage includes all lands within the GA boundary because some allotments and/or permitted head months include both private inholdings and adjacent Forest lands.
[2]A head month is defined as one month's occupancy by one animal (weaned or adult cow with or without calf, a bull, a steer, a heifer, a horse, a burro, a mule, 5 sheep, or 5 goats). PLP refers to 'private land permit', which authorizes grazing of generally unfenced private inholdings within a larger Forest allotment.
[3]The Snowies GA is outside the current area where grizzly bears may be present, but is included for completeness and future reference.

Vegetation and Fire Management

The existing Forest plans provide vegetation management guidance in a variety of forms. Vegetation treatment, including prescribed fire, is encouraged to improve habitat for various wildlife species and groups. Harvesting has been used within the action area as a tool used 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. The existing plans also include standards for maintaining hiding cover to benefit big game and other species. The NCDE grizzly bear amendments include guidance to reduce the risk of disturbance to bears during or as a result of vegetation management activities, and to maintain or increase habitat and cover where possible. Vegetation management must also adhere to other grizzly bear related guidance, including standards regarding motorized route density and food storage orders.

Currently, approximately 414,936 acres (14 percent of the action area) of the Forest is considered suitable for timber production (the purposeful growing, tending, harvesting, and regeneration of

regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use). Areas that are not suitable for timber production include such things as Recommended Wilderness Areas, eligible wild and scenic river corridors, riparian management zones, certain cultural and historical sites, and some others. In addition, lands with marginal timber growth potential based on landscape or vegetation characteristics, areas with limited access (including, for example, most areas identified with 'Primitive' or 'Semi-primitive non-motorized' Recreation Opportunity Setting categories), or areas with certain other management emphasis are not included in the lands suitable for timber production. Harvest for other multiple use values and purposes may occur on an additional 40 percent of the action area that are not suitable for timber production.

Average annual total harvest is calculated by decade and is displayed in Table 4 below. The Forest currently conducts prescribed burning on an average of 13,000 acres per year, which includes both forested and non-forested vegetation types. Naturally-ignited wildfires have been used under certain circumstances to meet resource objectives since approval of the 1986 Forest Plans. Wildfire acres managed for resource benefit are also tracked by decade. Suppression of wildfire has also been used for management of wildfires. Refer to Table 4 below for the total acres per decade treated under harvest, prescribed fire, fuel reduction, and wildfire acres managed for resource benefit.

Table 4. Acres of vegetation treatments and wildfire acres managed for resource benefit by decade, 1980-2017 (U.S. Forest Service, in litt. 2020).

Decade	Harvest (acres)[1]	Prescribed Fire (acres)[2]	Fuel Reduction (acres)[3]	Wildfire Managed for Resource Benefit (acres)
1980-1989	23,525	32,211	44,387	89,735
1990-1999	30,775	51,460	95,418	5,723
2000-2009	10,680	51,826	52,473	79,121
2010-2017	9,564	23,964	65,010	160,980

[1]Harvest activities include even-aged, uneven-aged, and intermediate harvest treatments.

[2]Includes overlap of burning in harvested stands. Prescribed fire activities include broadcast burning, jackpot burning, site preparation burning, and underburning. See the Fire and Fuels section for information on wildfires, including those used for resource benefit.

[3]Fuel reduction treatments include burning of piled material, chipping, compacting/crushing, fuel break, misc. treatment of natural fuels, piling, rearrangement, and thinning of hazardous fuels.

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 Elkhorns Wildlife Management Unit within the Elkhorns GA is also administratively withdrawn from oil and gas leasing, but could be available for other types of leasable minerals exploration and development. By act of

congress, the entire Rocky Mountain Range GA is withdrawn from future locatable or leasable minerals exploration or development.

Locatable mineral uses are managed through Plans of Operation and Notices of Intent that are developed at the time specific plans for minerals exploration or development are submitted to the Forest. The Forest averages roughly 30 active Plans of Operation or Notices of Intent in a given year, each of which generally disturbs less than one acre. The actual number that are active in any given year changes and is generally dependent on the market price for the minerals of interest.

Within the recovery zone, the only commercial hardrock mining rights on the Forest are for the Cotter Mine in the Upper Blackfoot GA. No mining activity is currently occurring at that site. Eight lease parcels occur in the Big Belts GA and are on hold pending further review and decision. One lease, which is shared with the Custer-Gallatin National Forest, occurs in the Crazies GA and is suspended.

The existing Lewis and Clark Plan includes guidance for oil and gas development in grizzly bear habitat that would constrain helicopter flights and seismic activity as well as guide other aspects of exploration and development in order to reduce the potential for impacts to grizzly bears. The NCDE grizzly bear amendments include standards and guidelines to further reduce potential impacts to grizzly bears form mining and oil and gas exploration and development. These requirements are focused on the recovery zone and NCDE zone 1.

Climate Change

In the 5-year status review, the Service examined climate change and potential effects on grizzly bears (U.S. Fish and Wildlife Service 2011). The most likely ways in which climate change may potentially affect grizzly bears are a reduction in snowpack levels, shifts in the denning season, shifts in the abundance and distribution of some natural food sources, and changes in fire regimes due to summer drought. The potential positive and negative effects would likely be variable and are difficult to predict. Grizzly bears are habitat generalists and opportunistic omnivores, which may make them less susceptible to changes in plant communities than some other wildlife species.

Existing Projects

Several projects are ongoing on the Forest and are likely to continue after the completion of this revised biological opinion and the record of decision for the 2021 Forest Plan. These projects and consultations are summarized below. Consultation with the Service has been completed for these actions, thus the actions are included in the environmental baseline. The projects described below are programmatic in nature and are either site-specific projects that are tiered to a programmatic consultation or programmatic consultations that are being tiered to or could be tiered to. In other words, the consultations associated with existing projects described below include either a programmatic biological opinion that site-specific projects tier to or are site-specific consultations that are tiered to a programmatic biological opinion. As mentioned, some of the effects associated with the existing programmatic consultations are likely to continue under the 2021 Forest Plan. Stand-alone consultations that are not programmatic in nature (i.e. they are not tiered to a programmatic biological opinion and are not being tiered to) are not

specifically described below since their effects have been fully considered and those effects will not continue under the 2021 Forest Plan consultation (they are not programmatic in nature). However, the effects of such stand-alone projects are reflected in the existing conditions displayed above.

For those biological opinions that have reporting requirements, we received the 'Biological Opinion Reporting for the Blackfoot Winter Travel Plan, Continued Implementation of the Helena National Forest Land and Resource Management Plan, Divide Travel Plan, Blackfoot Non-Winter Travel Plan, and the Tenmile South Helena Project' on June 29, 2020. The Forest has demonstrated that they are in compliance with the incidental take statements of the biological opinions for these projects.

Some existing consultations below will continue to remain valid post consultation on the 2021 Forest Plan, while other consultations will be superseded by this consultation on the 2021 Forest Plan. This revised biological opinion on the 2021 Forest Plan will supersede those biological opinions associated with the Blackfoot-North Divide Winter Travel Plan, continued implementation of the existing Forest Plan, and the NCDE grizzly bear amendments associated with the existing Helena and Lewis and Clark Forest Plans. Existing conditions related to the NCDE grizzly bear amendments are described in the various sections above rather than in this section as an existing project.

Birch Creek South Travel Plan
In 2006, the Service and the Forest consulted on the effects of the Birch Creek South travel plan on grizzly bears. The proposed action was the development of a programmatic travel plan for the non-wilderness portion of the Rocky Mountain Ranger District south of the North Fork of Birch Creek. The proposed Travel Plan would decrease the amount of roads open to motorized travel as well as trails open to ATV and motorcycle travel. The Forest's determination of effects for grizzly bears was 'may affect not likely to adversely affect'. The Service concurred with that determination on September 18, 2006 (U.S. Fish and Wildlife Service 2006). Implementation of the Birch Creek South travel plan will continue as planned under the 2021 Forest Plan.

Badger-Two Medicine Travel Plan
In 2008, the Service and Forest consulted on the effects of the Badger-Two Medicine travel plan on grizzly bears. The proposed action was the development of a programmatic travel plan for the non-wilderness portion of the Rocky Mountain Ranger District north of Birch Creek in the area commonly known as the Badger-Two Medicine Area. A total of approximately 9 miles of road would be open yearlong or seasonally to motorized travel. The majority of those roads would be restricted to existing roads along the periphery of the travel plan area. The roads access campgrounds, trailheads, and firewood cutting areas. Approximately 3.7 miles of the Whiterock Pass Road near the eastern boundary of the area would be open only for very occasional travel by permittees to access communication sites for maintenance or emergency repairs, but would not be open at any time to the public or for routine administrative travel. No trails would be open to motorized travel of any kind. Snowmobile travel would not be allowed anywhere in the travel plan area. The Forest's determination of effects for grizzly bears was 'may affect not likely to adversely affect'. The Service concurred with that determination on December 15, 2008 (U.S. Fish and Wildlife Service 2008). Implementation of the Badger-Two Medicine travel plan will continue as planned under the 2021 Forest Plan.

Blackfoot-North Divide Winter Travel Plan
In 2010, the Service and Forest consulted on the effects of the Blackfoot-North Divide winter travel plan on grizzly bears. The proposed action was the development of a programmatic winter travel plan for the Blackfoot-North Divide landscape. The Blackfoot landscape comprises the entire Lincoln Ranger District. The North Divide Landscape includes approximately 24,074 acres of contiguous Helena Ranger District lands extending south along the continental divide. The project area southern boundary parallels that portion of Forest Service road 136 along the continental divide, southwest of Marysville, with departures from the road on the east and west side of that block of Forest lands.

The Blackfoot-North Divide Winter Travel project designates whether a route or area is designated for over-the-snow travel as motorized or non-motorized and establishes season ending dates for snowmobile use. The proposed action did not include any ground disturbing activities. No new ski or snowmobile trails or routes were designated and no additional parking or access point improvements were proposed. More specifically: winter recreation use was defined, using topographic boundaries and features, in large areas of either motorized use or non-motorized use; all existing routes within motorized areas are open to over-the-snow vehicles; all existing routes within non-motorized areas unless designated are closed to over-the-snow vehicles; no changes occurred to the existing groomed trail system; and with the exception of the existing ungroomed trail up Stonewall Creek being reduced by one mile due to a non-motorized designation, no changes to the existing ungroomed system occurred (U.S Fish and Wildlife Service 2010a). Reference the 2010 biological opinion for the Blackfoot-North Divide winter travel plan for specific details and information (*Ibid*.).

The Blackfoot-North Divide winter travel plan also established effective ending dates for snowmobiling. As described above, the season ending date for designated winter motorized use areas and trails within the NCDE grizzly bear recovery zone is March 31, with the exception of the Copper Bowls extended use area. The season ending date for the Copper Bowls extended use area, approximately 3,233 acres, is May 31. The season ending date for the remainder of the designated winter motorized use areas and trails that occur outside of the NCDE grizzly bear recovery zone (from Highway 200 south) is April 15. The winter travel beginning date is December 2.

This winter travel plan would mostly result in effects that are insignificant or discountable to grizzly bears. The Service found the potential snowmobile disturbance to denning grizzly bears to be very improbable and discountable due to the low probability of a direct encounter of a snowmobile to a den and even in that unlikely case, the excellent insulative properties of snow to mitigate the noise. We did not anticipate measureable impacts to grizzly bears in spring habitat as the areas that would be suitable for spring snowmobiling would not typically overlap with spring grizzly bear habitats. Effects to recently emerged grizzly bears are of greater concern. The Service concluded that female grizzly bears with cubs and young are at greatest risk of negative impacts subsequent to den emergence. Females with cubs have high energetic needs in the spring, and cubs have limited ability to travel for several weeks after emergence from the den. These bears are the most likely subset of the population to linger near denning habitats through April and into May. Other subsets of the population are expected to move quickly toward low elevation spring habitats. Disturbance levels that cause a female to prematurely leave the den in spring or move from the den area could impair the fitness of the female and safety of the cubs. Based on the best available information, the Service concluded that proposed

snowmobile use on under the Blackfoot-North Divide winter travel would not significantly affect the grizzly bear population. Implementation of the Blackfoot-North Divide winter travel plan will continue as planned under the 2021 Forest Plan. However, since this revised biological opinion on the 2021 Forest Plan will analyze winter motorized use throughout the action area, including the Blackfoot-North Divide winter travel plan action area, it will supersede the 2010 biological opinion on the Blackfoot-North Divide winter travel plan.

Continued implementation of the 1986 Helena National Forest Plan
In 2014, the Service and Forest consulted on the effects of continued implementation of the 1986 Helena National Forest Plan on grizzly bears. The consultation applied to areas on the former Helena Forest in areas where grizzly bears may be present, both within and outside of the NCDE recovery zone. More specifically, the area included the entire Lincoln Ranger District and the Divide Landscape portion of the Helena Ranger District. The action area encompassed approximately 181,676 acres within the recovery zone and 354,606 acres outside of the recovery zone. The timeframe analyzed was 10 years.

Three program areas were the focus of the biological opinion: access management, food and attractant storage, and livestock grazing. Based on project-level consultations over the past 2 decades, these 3 program areas are responsible for most, if not all, of the adverse effects and incidental take of grizzly bears occurring.

The Lincoln Ranger District was simultaneously working on a non-winter travel plan, which addressed access management for the entire Lincoln Ranger District. Therefore, the effects of access management within the Lincoln Ranger District portion of the action area was not addressed in the 2014 biological opinion. Thus, the 2014 biological opinion focused on the effects of Forest Plan direction related to food and attractant storage and livestock grazing both within the Lincoln Ranger District and the Divide Landscape of the Helena Ranger District and the effects related to access management within the Divide Landscape of the Forest. In addition to the continued implementation of the Helena Forest Plan, information was provided on the amount of permanent and temporary roads that may be constructed in the Divide Landscape, which included the construction and use of up to 5 miles of permanent road and up to 30 miles of temporary road over the next 10 years.

Road densities within the Divide Landscape, authorized under the Helena Forest Plan, has the potential to adversely affect grizzly bears. Some areas of the Divide Landscape have no motorized activity while other areas receive heavy motorized use. Areas with high road densities may lead to the under-use of suitable habitat by grizzly bears. Access management on the Divide Landscape provides for use by grizzly bears but likely at lower numbers than inside the recovery zone. While periodic new road construction may occur, overall a downward trend in the miles of roads has been occurring, reflecting a trend on the Landscape that would reduce the potential for adverse effects on grizzly bears. Temporary roads may also result in adverse effects depending on site-specific information such as length and duration of use. Although existing and proposed road densities authorized under the Helena Forest Plan have the potential to adversely affect some grizzly bears in some areas of the Divide Landscape, we didn't expect such effects to increase significantly over the 10-year duration of 2014 biological opinion. Specific areas with higher road densities may lead to the under-use of suitable habitat by grizzly bears and may significantly impact some grizzly bears' ability to find food resources, breed and raise young,

and find shelter. However, grizzly bears are evidently tolerating existing levels of road densities in some areas.

Human access into grizzly bear habitat can lead to the habituation of grizzly bears to humans. Habituation to human foods and attractants in turn increases the potential for conflicts between people and grizzly bears. Habituated grizzly bears often obtain human food or garbage and become involved in nuisance bear incidents, and/or threaten human life or property. These grizzly bears are considered food conditioned and generally experience high mortality rates as they are eventually destroyed or removed from the population through management actions. No grizzly bear mortalities had been reported related to improper food storage. Under the management of food and attractant storage in the action area inside the recovery zone and on the Lincoln Ranger District, an increase in management removals of grizzly bears is not likely to occur. As grizzly bears increase in numbers outside of these areas, we could not rule out the potential risk that grizzly bears may become habituated and food conditioned and be subject to potential management removal at some time over the 10-year duration of 2014 biological opinion. It was reasonable to expect that some risk, albeit low, of adverse impacts to grizzly bears related to attractant management exists.

Conflicts arising from livestock grazing are recognized as a source of human-caused mortality of grizzly bears. Grizzly bears habituated to livestock as a food source are more likely to be destroyed or removed from the population due to management control and defense of property actions. No human-caused grizzly bear mortalities or management actions as a result of conflicts with livestock grazing had occurred on the Helena Forest since at least 1998. In accordance with 1986 IGBC Guidelines and Forest Plan direction, grizzly bears are no longer removed from MS-1 areas because of depredation or conflict with livestock on the Forest. If conflicts occur, they are resolved in favor of the grizzly bear. The direction for grazing allotments, in accordance with the IGBC guidelines, provides elevated protection for grizzly bears in MS-1 and MS-2 areas. As the presence of grizzly bears increase in the action area outside of the recovery zone, we expected an increase in the number of grizzly bears subject to potential management removal as a result of grizzly bear-livestock conflicts and the potential for conflict could not be ruled out.

Although management of grizzly bear habitat under the 1986 Helena Forest Plan may result in direct and indirect adverse effects on individual grizzly bears, we did not anticipate that the effects would have appreciable negative impacts on the NCDE grizzly bear population. Thus, we did not expect management to negatively affect recovery of the population. Though the areas outside the recovery zone are not essential to the conservation of the species, the Forest has managed the lands in such a way that they have allowed grizzly bears to expand into these areas. Thus, although individual grizzly bears may be adversely affected at times related to access management, food and attractant storage, and/or livestock grazing, we anticipate that grizzly bears will continue to occur within the action area, including outside of the recovery zone, into the future. Implementation of the 1986 Helena National Forest Plan will be superseded by the 2021 Forest Plan. Thus, this revised biological opinion on the 2021 Forest Plan will supersede the 2014 biological opinion on the continued implementation of the Forest Plan (U.S. Fish and Wildlife Service 2014).

Divide Travel Plan

In 2016, the Service and Forest consulted on the effects of the Divide Travel Plan on grizzly bears. The Divide Travel Plan established motorized and non-motorized access management

direction for most of the Divide Landscape. The consultation did not address the implementation of the Travel Plan, just the programmatic management direction. Separate site-specific decisions and actions have and will implement the Divide Travel Plan. The Divide Travel Plan direction included a reduction in the miles of roads open to the public, an increase in miles of motorized trails, changes in seasonal use of some roads, a decrease in snowmobile trails, and an increase in the extent of areas closed to cross-country snowmobiling. Refer to the biological opinion on the Divide Travel Plan for specific information (U.S. Fish and Wildlife Service 2016a).

As a result of the Divide Travel Plan, some areas will have no motorized activity while other areas will receive heavy motorized use. However, the likelihood for disturbance and displacement due to access management would decrease from the existing condition as a result of the Travel Plan direction since the linear open route densities would decrease. While an improvement in access conditions will occur, some areas of high linear road densities will still occur in localized areas. Areas with high road densities may lead to the under-use of suitable habitat by grizzly bears and may significantly impact some grizzly bears' ability to find food resources, breed and raise young, and find shelter. Based on this, the Divide Travel Plan would have the potential to adversely affect some individual grizzly bears. However, grizzly bears are evidently tolerating existing levels of road densities in some areas.

The proposed action would increase the miles of designated non-motorized trails for hiking, horseback riding, and mountain biking. Non-motorized trails are not expected to result in significant or adverse effects. In addition, the Divide Travel Plan will reduce the number of miles of snowmobile routes and increase the amount of area closed to snowmobiles. Grizzly bear denning had not been documented in the action area and the likelihood that denning is occurring is very low. Thus, effects to grizzly bears from snowmobiling are extremely unlikely to occur.

Although the proposed Travel Plan may result in adverse effects to some individual grizzly bears, we do not anticipate that these effects will have appreciable negative impacts on the NCDE grizzly bear population. The action area is located completely outside the recovery zone. Even though areas outside the recovery zone are not necessary for the conservation of the species, they have been managed in such a way that have allowed grizzly bears to expand into them. Grizzly bears outside of recovery zones probably experience a higher level of adverse impacts due to land management actions than do grizzly bears inside. However, grizzly bears are able to live in habitat outside of the recovery zones despite lack of mandated habitat protections or direction specific to grizzly bear management. Although individual grizzly bears may be adversely affected at times related to the Divide Travel plan and associated access management, we anticipated that grizzly bears will continue to occur within the Divide Travel Plan action area into the future. We concluded that the Divide Travel Plan minimizes the potential for adverse impacts to grizzly bears when compared to previous access management. Based on the best available information, the Service concluded that the Divide Travel Plan would not significantly affect the grizzly bear population. Implementation of the Divide Travel Plan will continue as planned under the 2021 Forest Plan.

Blackfoot Non-Winter Travel Plan

In 2016, the Service and Forest consulted on the effects of the Blackfoot Non-Winter Travel Plan on grizzly bears. The proposed action was the development of a programmatic non-winter travel plan for that portion of the Blackfoot landscape area (Lincoln Ranger District) occurring outside

the Scapegoat Wilderness. The proposed action designated motorized and non-motorized routes for non-winter travel and resulted in changes to the existing motorized and non-motorized route system. It included closing some roads and trails that were currently open to motorized use and opening some roads and trails for motorized use that were currently closed. It also included some limited new construction and reconstruction of roads and trails. Refer to the biological opinion on the Blackfoot Non-Winter Travel Plan for specific information on proposed actions (U.S. Fish and Wildlife Service 2016b).

Based on road density, the Blackfoot Non-Winter Travel Plan has the potential to adversely affect grizzly bears. However, the overall level of adverse effects would decrease from the previous condition and improvement to motorized access conditions would improve both inside and outside of the recovery zone. While an improvement in overall access conditions will occur, some areas of high linear road densities will still occur in localized areas. Some areas will have no motorized activity while other areas will receive heavy motorized use. Although an overall reduction in open motorized routes would occur, the connectivity among some motorized routes, in particular motorized trails, would increase due to opening of currently closed connector routes and/or the construction of connector routes. In addition, the proposed action would increase the miles of designated non-motorized trails for hiking, horseback riding, and mountain biking.

Road densities authorized under the Blackfoot Non-Winter Travel Plan have the potential to adversely affect some grizzly bears in some areas. The likelihood for disturbance and displacement due to access management would decrease from the previous condition as a result of implementation of the Blackfoot Non-Winter Travel Plan. Specific areas with higher road densities may lead to the under-use of suitable habitat by grizzly bears and may significantly impact some grizzly bears' ability to find food resources, breed and raise young, and find shelter. However, grizzly bears appear to be tolerating existing road densities in some areas.

Although the Blackfoot Non-Winter Travel Plan may result in direct and indirect adverse effects on individual grizzly bears, we do not anticipate that these effects will have appreciable negative impacts on the NCDE grizzly bear population. The areas of higher route densities are mostly those areas occurring outside the recovery zone. Even though the areas outside the recovery zone are not necessary for the conservation of the species, they have been managed in such a way that have allowed grizzly bears to expand. The Blackfoot Non-Winter Travel Plan will reduce linear road densities, thus improving the access conditions over the previous condition. Although individual grizzly bears may be adversely affected at times related to the Blackfoot Non-Winter Travel Plan and associated access management, we anticipated that grizzly bears will continue to occur within the action area, both inside and outside of the recovery zone, into the future. Based on the best available information, the Service concluded that the Blackfoot Non-Winter Travel Plan would not significantly affect the grizzly bear population. Implementation of the Blackfoot Non-Winter Travel Plan will continue as planned under the 2021 Forest Plan.

Stonewall Vegetation Project

In 2016, the Service and Forest consulted on the effects of the Stonewall Vegetation Project (Stonewall Project) on grizzly bears. In 2017, the Park Creek fire burned across approximately 56 percent of the Stonewall Project area. Subsequently, the changed condition and a modified proposed action, Alternative 4, were addressed in a Supplemental Environmental Impact Statement (SEIS) with the Final ROD signed December 12, 2019. Consultation on the Stonewall

Vegetation Project was reinitiated on in 2021. The revised biological assessments address the effects of the changed condition and Alternative 4 that was developed following the 2017 fire. The Stonewall Project is located on the Lincoln Ranger District of the Forest, approximately 3 miles north and west of Lincoln, Montana. The project focuses on reducing hazardous fuel buildup and improving forest health by using various vegetative treatments on approximately 1,381 acres including: 706 acres of commercial harvest, 406 acres of pre-commercial thinning, and 269 acres of prescribed burning. Commercial logging operations include 80 percent tractor logging and 20 percent skyline logging. Pre-commercial thinning acres include 46 percent mechanical treatment and 54 percent hand treatment with chainsaws. For low severity prescribed burning it is anticipated that 30 to 70 percent of the proposed treatment acres would be burned. Fire created openings up to 5 acres in size may be created in low severity burn units. No mixed or high severity burning are proposed under the changed condition. Secondary treatments include various burn treatments within the commercial and pre-commercial treatment units ranging from pile burning to broadcast burning. Approximately 27.9 miles of road would be used as haul routes during implementation. This includes 25.3 miles of existing roads requiring maintenance or improvements and four temporary road segments totaling 0.9 mile. Each of the four new segments of temporary road will be obliterated within 1 to 2 years of construction. Additional project information can be found in the revised biological assessments prepared for the Stonewall Project (U.S. Forest Service 2021). Implementation of the Stonewall Vegetation Project will continue as planned under the 2021 Forest Plan.

Previously, in our 2016 consultation for the Stonewall Project (U.S. Fish and Wildlife Service 2016a), we tiered the potential adverse effects within the Arrastra Mountain subunit to the programmatic biological opinion and incidental take statement regarding the effects of the Blackfoot Non-winter Travel Plan (U.S. Fish and Wildlife Service 2016b). However, since that time, the Forest and Service have realized that an error was made in the analysis for the Blackfoot Non-winter Travel Plan when calculating the total motorized route density (TMRD) for the Arrastra Mountain subunit (U.S. Forest Service 2021a; 2020, 2021 *in litt.*). When calculating TMRD, the Copper Bowls extended use area (late season snowmobile use) was included into the calculations. However, as explained in the biological opinion on the Blackfoot Winter Travel Plan, only open roads are used to access the extended use area and only secure core is temporarily affected (U.S. Fish and Wildlife Service 2010). No restricted roads will be used to access this extended use area. Thus, TMRD is not affected by the Copper Bowls extended use area and should not have been reflected in the TMRD metric. In addition, the Forest provided the Service a supplement to the Stonewall Project revised biological assessment (U.S. Forest Service 2021b). This supplement included updates based on more up-to-date information and reflects an updated moving windows analysis based on the current implementation status of the 2016 Blackfoot Travel Plan and includes updates to the Forest INFRA layer reflecting changes to motorized routes due to travel plan implementation. With the correction made to TMRD regarding the Copper Bowls extended use area, and the receipt of the supplement to the Stonewall Project revised biological assessment, the existing, ongoing access management conditions (on-the-ground) in the Arrastra Mountain subunit are 15 percent open motorized route density (OMRD), 17 percent TMRD, and 76 percent secure core. As such, these conditions are not resulting in adverse effects to grizzly bears as previously stated in our 2016 biological opinions on the Stonewall Project and the Blackfoot non-winter travel plan (U.S. Fish and Wildlife Service 2016a, 2016b).

As consulted on for the Blackfoot Non-winter Travel Plan (which is in the baseline for the Stonewall Project), full implementation of the Blackfoot non-winter travel plan would result in the Arrastra subunit having 15 percent OMRD, 15 percent TMRD, and 76 percent secure core. These metrics of 15 percent OMRD, 15 percent TMRD, and 76 percent secure core reflect the baseline condition of the Arrastra subunit based on previous consultations while the metrics of 15 percent OMRD, 17 percent TMRD, and 76 secure core represent the actual condition on-the-ground at the time of this revised consultation for the Stonewall Project. Neither of these scenarios (baseline and on-the-ground conditions) result in significant or adverse effects to grizzly bears.

Activities under the Stonewall Project related to motorized access (use of restricted routes and temporary road) could result in a temporary 2 percent increase in OMRD. This temporary increase to 17 percent OMRD would continue to meet the guidelines for OMRD (which is 19 percent) and adverse effects to grizzly bears due to this temporary increase would not occur. Upon completion of the Stonewall Project, temporary roads would be obliterated and OMRD would return to the existing condition of 15 percent. The effects of the temporary changes to OMRD assume that all project roads would be active at the same time. However, road densities would be changing on a regular basis, both increasing and then decreasing as restricted roads and temporary roads are used, then closed or reclaimed. Thus, the effects on-the-ground would likely be less than described here but would not be more than 17 percent OMRD at any time. No other changes from the existing access condition would occur within the Arrastra Mountain subunit and the percentages for TMRD and secure core will not be affected by the action. In sum, the overall effect related to motorized access would be insignificant.

Telegraph Vegetation Project

In 2017, the Service and Forest consulted on the effects of the Telegraph Vegetation Project on grizzly bears. The Telegraph Project is located on the Helena Ranger District of the Forest, approximately 15 miles southwest of Helena and 5 miles south of Elliston, Montana. The project is intended to help meet goals and direction in the 1986 Helena Forest Plan, ensure diverse and sustainable forest stands and wildlife habitat in the future, improve conditions for fire suppression, recover economic value of dead and dying trees, and maintain and improve watershed values. Implementation of the Telegraph Vegetation Project will continue as planned under the 2021 Forest Plan.

Proposed vegetation treatments on 5,715 acres include regeneration harvest on 2,724 acres, intermediate harvest on 259 acres, precommercial thinning on 1,153 acres, prescribed fire on 1,079 acres, mechanical rearrangement of fuels on 344 acres, and whitebark pine release on 157 acres. Approximately 85.5 miles of road would be used as haul routes during project implementation. This includes road maintenance on 42.6 miles of road, reconstruction of 32.6 miles, construction of 0.7 mile of new road, and construction of 9.6 miles of temporary road. The project also includes rerouting approximately 920 feet of Ontario Creek and restoration of the Little Blackfoot River floodplain near the confluence with Ontario Creek. Additional project information can be found in the biological assessment prepared for the Telegraph Vegetation Project.

Other than access, no activities under the proposed action are likely to adversely affect grizzly bears (U.S. Fish and Wildlife Service 2017d). We found that the adverse effects related to the existing, ongoing access conditions and temporary road construction and use were adequately

analyzed in the 2014 programmatic biological opinion on the continued implementation of the Forest Plan and 2016 programmatic biological opinion on the Divide Travel Plan and the proposed actions related to access conform to the incidental take statements associated with those opinions. Thus, formal consultation for the Telegraph Vegetation Project was tiered to the consultations on the continued implementation of the Forest Plan and the Divide Travel Plan. Our finding was based on: (1) the baseline access condition falls within the scope of the programmatic biological opinions, (2) the effects of access management to grizzly bears are consistent with those anticipated and analyzed in the programmatic biological opinions, (3) the amount of incidental take anticipated in the incidental take statements in the 2014 and 2016 programmatic opinions will not be exceeded, and (4) the proposed action adheres to the appropriate terms and conditions associated with the reasonable and prudent measures identified in the 2014 and 2016 incidental take statements. Accordingly, the Telegraph Vegetation Project is consistent with the 2014 and 2016 programmatic biological opinions and incidental take statements.

In summary, we reviewed the revised biological assessment for the Telegraph Vegetation Project regarding the environmental baseline for the action area, the effects of the action, and the cumulative effects within the action area; the 2014 programmatic biological opinion on the continued implementation of the Forest Plan; the 2016 programmatic biological opinion on the Travel Plan; the information we relied upon to develop the 2014 and 2016 programmatic biological opinions; and information in our files. After our review of those documents and the status of grizzly bears, the environmental baseline, the effects of the action, and the cumulative effects, it was the Service's biological opinion that the Telegraph Vegetation Project is not likely to jeopardize the continued existence of grizzly bears.

Tenmile South Helena Vegetation Project

In 2018, the Service and Forest consulted on the effects of the Tenmile South Helena Vegetation Project on grizzly bears (Tenmile Project). The Tenmile Project includes activities on approximately 17,595 acres of Forest land. These activities include approximately 2,239 acres of regeneration harvest, 1,061 acres of improvement harvest, 353 acres of precommercial thinning, 1,950 acres of shaded fuel break treatments, 4,803 acres of private land buffer treatments, 7,189 acres of low-severity prescribed burn, 11 miles of temporary road construction followed by full obliteration, 21 miles or road reconstruction and/or reconditioning, 26 miles of road maintenance, 52 miles of road decommissioning, and 8 miles of road closure. All of these activities are described in detail in the biological assessment for the project. Implementation of the Tenmile Project will continue as planned under the 2021 Forest Plan.

Other than access, no activities under the proposed action are likely to adversely affect grizzly bears (U.S. Fish and Wildlife Service 2018). The effects of access management under the existing, baseline access condition in the action area and the construction of temporary roads were previously analyzed and consulted on in the 2014 programmatic biological opinion on the continued implementation of the Forest Plan and the 2016 programmatic biological opinion on the Divide Travel Plan. Thus, formal consultation for the Tenmile Project related to the baseline access condition and temporary road construction and use was tiered to the consultations on the continued implementation of the Forest Plan and the Divide Travel Plan. We found that the adverse effects related to the existing, ongoing access conditions and temporary road construction were adequately analyzed in those programmatic biological opinions and conform to the incidental take statements associated with those opinions. Our finding was based on: (1)

the baseline access condition and temporary road construction falls within the scope of the programmatic biological opinions, (2) the effects of the existing, baseline access condition and temporary road construction are consistent with those anticipated and analyzed in the programmatic biological opinions, (3) the amount of incidental take anticipated in the incidental take statements will not be exceeded, and (4) the proposed action adheres to the appropriate terms and conditions associated with the reasonable and prudent measures identified in the incidental take statements. Accordingly, the portions of the Tenmile Project related to the baseline access condition and temporary road construction and use is consistent with the 2014 and 2016 programmatic biological opinions and incidental take statements.

The other effects related to access management, which include using 17.6 miles of closed roads, may result in additional adverse effects to female grizzly bears that may be using the action area and were analyzed in a site-specific biological opinion issued for the Tenmile Project. These effects would be temporary and access conditions would return to existing levels or better post project implementation. However, because adverse effects may already be occurring as a result of the existing, baseline condition and proposed temporary road construction, allowing a temporary increase in linear open and/or total road density related to the use of closed roads may temporarily increase the negative impacts in the action area. The use of these closed roads along with the temporary road construction would temporarily increase linear open and/or total road densities in the Black Mountain-Brooklyn Bridge, Jericho, and Quartz Creek elk herd units and may result in adverse effects to individual female grizzly bears, potentially disrupting normal breeding (or more specifically, cub rearing) or feeding patterns in the short-term, as a result of significant under-use of habitat by grizzly bears. Based on the best available information, the Service concluded that the Tenmile Project would not significantly affect the grizzly bear population.

Willow Vegetation Project

In 2019, the Service and Forest consulted on the effects of the Willow Vegetation Project on grizzly bears. The Willow Creek Project was developed to address insect and disease issues with project treatments that are intended to promote resiliency to insect and disease while provide for the retention of larger trees, helping to lower the risk of stand replacing wildfire. Proposed vegetation treatments include: 37 acres of intermediate harvest; 1,384 acres of regeneration harvest; 152 acres of precommercial thinning; and 617 acres of prescribed burning. Approximately 26.7 miles of road would be used as haul routes during implementation. This includes reconditioning of 5.2 miles existing road, 14.7 miles of reconstruction of secondary arterial roads, 3.1 miles of reconstruction of temporary roads, and new construction of 3.7 miles of temporary roads. In addition, approximately 9.9 miles of non-Forest roads may be used as haul routes. Road maintenance, including best management practices (BMPs) will also occur. All temporary roads will be obliterated within 3 years of construction, with all associated harvest activities completed prior to road obliteration. The remaining harvest and hauling activities would be completed within 4 years, while prescribed burning activities may be completed over a 10-year period. Additional project information can be found in the biological assessments prepared for the Willow Creek Project. Implementation of the Willow Vegetation Project will continue as planned under the 2021 Forest Plan.

Other than access, no activities under the proposed action are likely to adversely affect grizzly bears (U.S. Fish and Wildlife Service 2019a). We found that the adverse effects related to the existing, ongoing access conditions were adequately analyzed in the 2016 programmatic

biological opinion on the Blackfoot Non-Winter Travel Plan and the proposed actions related to access conform to the incidental take statement associated with that opinion. Thus, formal consultation for the Willow Vegetation Project was tiered to the programmatic consultation on the Blackfoot Non-Winter Travel Plan. Our finding is based on: (1) the baseline access condition falls within the scope of the programmatic biological opinion, (2) the effects of access management are consistent with those anticipated and analyzed in the programmatic biological opinion, (3) the amount of incidental take anticipated in the incidental take statement will not be exceeded, and (4) the proposed action adheres to the appropriate terms and conditions associated with the reasonable and prudent measures identified in the 2016 incidental take statement. Accordingly, the Willow Vegetation Project is consistent with the 2016 programmatic biological opinion on the Blackfoot Non-Winter Travel Plan and its incidental take statement.

In summary, we reviewed: the biological assessment for the Willow Vegetation Project regarding the environmental baseline for the action area, the effects of the action, and the cumulative effects within the action area; the 2016 programmatic biological opinion on the Blackfoot Non-Winter Travel Plan; the information we relied upon to develop the 2016 programmatic biological opinion on the Blackfoot Non-Winter Travel Plan; and information in our files. After our review of the those documents and the status of grizzly bears, the environmental baseline, the effects of the action, and the cumulative effects, it was the Services biological opinion that the Willow Creek Project is not likely to jeopardize the continued existence of grizzly bears.

Wasson Vegetation Project

In 2019, the Service and Forest consulted on the effects of the Wasson Vegetation Project on grizzly bears. The Wasson Creek Project will treat 63 acres through commercial thinning of overstocked stands in order to improve forest health. The proposed activities, including haul routes, would use existing road templates. No temporary road construction, new road construction, or road reconstruction is required. Post-harvest units would receive follow-up treatment through a combination of prescribed fire treatments including: low-severity underburn, jackpot burning, and machine-pile burning. All activities are anticipated to be completed within 3 years. Additional project information can be found in the biological assessment prepared for the Wasson Creek Project. Implementation of the Wasson Vegetation Project will continue as planned under the 2021 Forest Plan.

Other than access, no activities under the proposed action are likely to adversely affect grizzly bears (U.S. Fish and Wildlife Service 2019b). We found that the adverse effects related to the existing, ongoing access conditions were adequately analyzed in the 2016 programmatic biological opinion on the Blackfoot Non-Winter Travel Plan and the proposed actions related to access conform to the incidental take statement associated with that opinion. Thus, formal consultation for the Wasson Vegetation Project was tiered to the programmatic consultation on the Blackfoot Non-Winter Travel Plan. Our finding is based on: (1) the baseline access condition falls within the scope of the programmatic biological opinion, (2) the effects of access management are consistent with those anticipated and analyzed in the programmatic biological opinion, (3) the amount of incidental take anticipated in the incidental take statement will not be exceeded, and (4) the proposed action adheres to the appropriate terms and conditions associated with the reasonable and prudent measures identified in the 2016 incidental take statement. Accordingly, the Wasson Vegetation Project is consistent with the 2016 programmatic biological opinion on the Blackfoot Non-Winter Travel Plan and its incidental take statement.

In summary, we reviewed: the biological assessment for the Wasson Vegetation Project, regarding the environmental baseline for the action area, the effects of the action, and the cumulative effects within the action area; the 2016 programmatic biological opinion on the Blackfoot Non-Winter Travel Plan; the information we relied upon to develop the 2016 programmatic biological opinion on the Blackfoot Non-Winter Travel Plan; and information in our files. After our review of the those documents and the status of grizzly bears, the environmental baseline, the effects of the action, and the cumulative effects, it was the Services biological opinion that the Wasson Creek Project is not likely to jeopardize the continued existence of grizzly bears.

Middleman Project

In 2021, the Service and Forest consulted on the effects of the Middleman Project on grizzly bears. The Middleman Project includes activities on approximately 53,131 acres of Forest land. The treatment methods used and approximate acreage of each include: timber harvest and associated prescribed burning on 6,669 acres, including intermediate harvest (3,019 acres), even-aged regeneration harvest (1,333 acres), two-aged regeneration harvest (2,145 acres), and liberation harvest/overstory removal (171 acres); prescribed burning (not associated with timber harvest) on 45,934 acres, including broadcast burn (mixed severity), with or without handpiling (11,733 acres), broadcast/underburn (low severity), with or without handpiling (15,443 acres), maintenance broadcast/underburn, with or without handpiling (15,690 acres), and handpile/burn (3,069 acres); and pre-commercial thinning on 528 acres. Implementation of the project would occur over a period of about 15 to 20 years. All of these activities are described in detail in the biological assessment for the project. Road treatments associated with the Middleman Project include the construction of approximately 46 miles of temporary route segments. Temporary routes would be obliterated (restored to natural contours) upon completion of implementation. Approximately 90 miles of existing routes have been identified to facilitate the transport of timber (haul routes) and provide access for other mechanical equipment throughout the project area. The Kingsberry Road re-route includes new construction of approximately 0.26 mile and the decommissioning of approximately 0.30 mile of system road.

In addition to timber harvest, prescribed burn treatments, and associated road treatments the Middleman Project includes watershed improvement projects. Eight dispersed campsites within the Magpie and Avalanche drainages are proposed to be improved and stabilized to decrease erosion and sedimentation to streams. Associated unauthorized motorized routes impacting Avalanche Creek and Magpie Creek would be obliterated and restored. Stream and riparian restoration is proposed for Upper Trout Creek, including reducing erosion and sedimentation to the stream, restoring floodplain function, removing aquatic organism barriers, and improving riparian vegetation condition and extent. Ten active range allotments have livestock grazing that is impacting streams, wetlands, and riparian areas where range improvement activities will occur, including upland water developments, cattleguard placement, and riparian fencing. Shrub planting and bank stability treatments are components of the riparian fencing projects. The Middleman Project is also proposing the placement of beaver dam analog structures to mimic the presence of beaver dams to restore stream and riparian ecosystems. Six culverts would be upgraded, as funding allows, to large structures that would accommodate full aquatic organism passage and 100-year flow events. Additional culvert replacements would occur along haul routes in accordance with best management practices. Refer to the biological opinion on the Middleman Project for specific information on proposed actions (U.S. Fish and Wildlife Service

2021d). Implementation of the Middleman Project will continue as planned under the 2021 Forest Plan.

The effects of access management under the existing, baseline motorized access condition in the Middleman Project action area may adversely affect grizzly bears during project implementation at some point in the future if female grizzly bears begin to use the action area. These effects may be insignificant in some situations or adverse in others. Adverse effects may significantly impact an adult female grizzly bears' ability to find food resources, breed and raise young, and find adequate shelter at some time. Project effects related to access management, which includes using restricted/closed routes and temporary routes, may result in additional adverse effects to female grizzly bears that may be using the action area at some point during project implementation. These effects would be temporary as access conditions would return to pre-project conditions post-implementation. However, because adverse effects may already be occurring as a result of the existing, motorized access baseline condition, allowing additional, temporary impacts associated with motorized access may result in additional adverse effects to grizzly bears that may use the action area during project implementation. In other words, some female grizzly bears that may use the action area in the future may experience displacement effects in some areas due to the under-use of suitable habitat as a result of the existing condition and may experience further avoidance as a result of the use of the temporary and/or restricted routes. With the exception of the potentially adverse effects related to motorized access, the remaining effects to grizzly bears as a result of the Middleman Project would be insignificant and/or discountable. Based on the best available scientific information reviewed in for the Middleman Project consultation, the Service concluded that the Middleman Project will not negatively impact the recovery of the NCDE grizzly bear population.

North Belts, South Belts, Little Belts, and Elkhorns travel plans

In 2021, the Service and Forest consulted on the effects of the ongoing travel plans for the northern portion of the Big Belt Mountains (North Belts), the southern portion of the Big Belt Mountains (South Belts), the Little Belt Mountains (Little Belts; including the Little Belts, Castle, and North Half Crazy Mountains), and the Elkhorn Mountains (Elkhorns) on grizzly bears. The North Belts, South Belts, Little Belts, and Elkhorns travel plans established motorized and non-motorized access management direction. The proposed action analyzed in this 2021 consultation included those components of the North Belts, South Belts, Little Belts, and Elkhorns Travel Plans that have yet to be implemented. The components of the travel plans that have already been implemented were considered as part of the environmental baseline. Refer to the biological opinion for specific details for each individual travel plan (U.S. Fish and Wildlife Service 2021e).

At some point in the future, if female grizzly bears begin using the travel plans action areas, the ongoing effects of the existing baseline motorized access conditions associated with the North Belts, South Belts, Little Belts, and Elkhorns travel plans may result in adverse effects to individual female grizzly bears as a consequence of the potential disturbance and/or displacement. Although the North Belts, South Belts, Little Belts, and Elkhorns travel plans may result in adverse effects to some individual grizzly bears at some point in the future, we do not anticipate that these effects will have appreciable negative impacts on the NCDE grizzly bear population. The action area is located completely outside the recovery zone. Even though areas outside the recovery zone are not necessary for the conservation of the species, they have been managed in such a way that have allowed grizzly bears to expand. Grizzly bears outside of

recovery zones probably experience a higher level of adverse impacts due to land management actions than do grizzly bears inside. However, grizzly bears are able to live in habitat outside of the recovery zones despite lack of mandated habitat protections or direction specific to grizzly bear management. Although individual grizzly bears may be adversely affected at times related to the associated access management under the North Belts, South Belts, Little Belts, and Elkhorns travel plans, if and when female grizzly bears occur in the action area, we concluded that based on the best available scientific information reviewed in this consultation, such adverse effects will not negatively impact the recovery of the NCDE grizzly bear population. Further, we expect the North Belts, South Belts, Little Belts, and Elkhorns travel plans direction will result in conditions that support the use of NCDE zones 2 and 3 for dispersal or exploratory movements, and potentially some home range establishment at some point in the future, albeit at densities much lower than those in the recovery zone. Thus, it was our opinion that the North Belts, South Belts, Little Belts, and Elkhorns travel plans would not appreciably reduce the likelihood of both the survival and recovery of grizzly bears. Implementation of the North Belts, South Belts, Little Belts, and Elkhorns travel plans will continue as planned under the 2021 Forest Plan.

Hogum Wildlife Resilience Project

In 2021, the Service and Forest consulted on the effects of the Hogum Wildlife Resilience Project (Hogum Project) on grizzly bears. The Hogum Project includes harvest treatments on approximately 1,061 acres using various treatment types including improvement cut, salvage cut, stand clear cut with leave trees, two-aged seed tree, two-aged shelterwood, roadside treatment, and public use post and pole. Logging systems include skyline and tractor harvesting methods. In addition, approximately 1,390 acres would receive prescribed burn treatments, including low severity and mixed severity treatments. Prescribed fire would be used as the primary treatment in some units and as secondary treatments within harvest units. Fuels remaining in units post-harvest will be treated through a combination of pile burning, broadcast burning, and jackpot burning.

The proposed action includes 30 miles of haul routes including construction of 10 miles of temporary roads, 9 miles of reconditioning existing open or closed roads, and 11 miles of reconstruction of existing road templates. Temporary road construction consists of new construction where there is no existing road template and the reconstruction of old roadbeds that are not system roads and are currently grown in with conifers. Road reconditioning allows for safe timber hauling while minimizing impacts to water resources. Road reconstruction may include more significant improvements such as realignment, curve widening, drainage structures, installation/upgrade of culverts or subgrade boulder or cobble excavation and removal. All temporary road segments including both new construction and reconstruction of existing road templates, would be constructed to the minimum standards necessary for log hauling and will be decommissioned within three years of construction. All system roads that will be reconditioned or reconstructed to be used as haul routes will be returned their pre-project motorized access status.

It is anticipated that all timber harvest will be completed within a 5-year period and burning of harvest units completed within 5 to 6 years. Prescribed fire only treatments are anticipated to be completed within 10 years. Refer to the biological opinion on the Hogum Project for specific information on proposed actions (U.S. Fish and Wildlife Service 2021f). Implementation of the Hogum Project will continue as planned under the 2021 Forest Plan.

The effects of access management under the existing, baseline motorized access condition in the Hogum Project action area may be affecting grizzly bears. These effects may be insignificant in some situations or adverse in others. Adverse effects may significantly impact an adult female grizzly bears' ability to find food resources, breed and raise young, and find adequate shelter at some time. Project effects related to access management, which includes using restricted/closed roads and temporary roads, may result in additional adverse effects to female grizzly bears that may be using the action area. These effects would be temporary as access conditions would return to pre-project conditions post-implementation. However, because adverse effects may already be occurring as a result of the existing, baseline condition, allowing additional, temporary impacts may result in additional adverse effects to grizzly bears that may be using the action area. In other words, some female grizzly bears using the action area may already be experiencing displacement effects in some areas due to the under-use of suitable habitat as a result of the existing condition and may experience further avoidance as a result of the use of the temporary and/or closed roads. With the exception of the potentially adverse effects related to motorized access, the remaining effects to grizzly bears as a result of the Hogum Project would be insignificant and/or discountable. Based on the best available scientific information reviewed in for the Hogum Project consultation, the Service concluded that the Hogum Project will not negatively impact the recovery of the NCDE grizzly bear population.

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 proposed action.

Motorized Access

General Effects of Motorized Access on Grizzly Bears

This section provides a general discussion of direct and indirect effects of motorized access management on grizzly bears as affected by motorized route densities. Research has confirmed adverse impacts of roads on grizzly bears (IGBC 1987, Mace et al. 1996, Mace et al. 1999, Proctor et al. 2018, Proctor et al. 2019). Negative impacts associated with roads and high road densities influence habitat use patterns of individual grizzly bears as well as the population. Proctor et al. (2019) found that motorized access affects grizzly bears at the individual level by effecting habitat use, home-range selection and the ability to move across the landscape. The same study concluded that effects of motorized access on individual bears also results in effects at the population level due to habitat fragmentation, and decreased survival and reproductive rates.

Displacement and security. Many grizzly bears under-use or avoid otherwise preferred habitats that are frequented by people. Not all avoidance results in significant impacts to grizzly bears. However, if road densities reach a level that such under-use of preferred habitat represents

modification of normal grizzly bear behavior, grizzly bears may experience significant impacts. Negative association with motorized routes arises from the grizzly bears' response to vehicles, vehicle noise and other human-related noise around roads, human scent along roads, and hunting and shooting along or from roads. Grizzly bears that experience such negative consequences learn to avoid the disturbance and annoyance generated by motorized routes. Some may not change this resultant avoidance behavior for long periods after road closures. Even occasional human-related vehicle noise can result in annoying grizzly bears to the extent that they continue to avoid roaded habitat.

All factors contributing to direct links between roads and displacement from habitat have not been quantified. The level of road-use by people is likely an important factor in assessing the potential displacement caused by any motorized route. Grizzly bears were consistently displaced from roads and habitat surrounding roads, often despite relatively low levels of human use (Mattson et al. 1987, McLellan and Shackleton 1988, Aune and Kasworm 1989, Kasworm and Manley 1990, Mace and Manley 1993, Mace et al.1996).

In Montana, Aune and Stivers (1982) reported that grizzly bears avoided roads and adjacent corridors even when the area contained preferred habitat for breeding, feeding, shelter, and reproduction. McLellan and Shackleton (1988) found that grizzly bears used areas near roads less than expected in southeastern British Columbia and estimated that 8.7 percent of the total area was rendered incompatible for grizzly bear use because of roads. In Montana, Mace and Manley (1993) reported use of habitat by all sex and age classes of grizzly bears was less than expected in habitats where total road densities exceeded 2 miles per square mile. Twenty-two percent of the South Fork Study area exceeded 2 miles per square mile. Adult grizzly bears used habitats less than expected when open motorized access density exceeded 1 mile per square mile. Further, female grizzly bears in the South Fork Study area tended to use habitat more than 0.5 mile from roads or trails greater than expected. As traffic levels on roads increased, grizzly bear use of adjacent habitat decreased (Mace et al. 1996). In Yellowstone, Mattson et al. (1992) reported wary grizzly bears avoided areas within 2 kilometers (1.2 miles) of major roads and 4 kilometers (2.4 miles) of major developments or town sites.

Avoidance behavior is often strongest in adult grizzly bears, with males selecting for high quality habitats and absence of humans (Gibeau et al. 2002). Males that were found using high quality habitat near roads, did so during the night where hiding cover was available (ibid). However, adult females were more likely to avoid humans altogether, rather than seek out the highest quality habitats that may be near roads. Mueller et al. (2004) reported all age and sex classes used habitats closer to high-use roads and development during the human inactive period. All bears in the study showed a considerably greater avoidance of high-use roads and development during periods of high human activity. They did show however, that regardless of the time of day, subadult bears were found closer to high-use roads than adult bears. Gibeau et al. (2002) also demonstrated that subadults were almost always closer to human activity than adults. Boulanger and Stenhouse (2014) found that subadult grizzly bears were most vulnerable to road-based mortality.

Mace et al. (1996) and other researchers have used 500 meters as the zone of influence around roads. Waller and Servheen (2005) also demonstrated avoidance of areas within 500 meters of U.S. Highway 2. Benn and Herrero (2002) set zones of influence of 500 meters and 200 meters around roads and trails, respectively. They reported that all 95 human-caused grizzly bear

mortalities with known locations that occurred in Banff and Yoho National Parks between 1971 and 1998 occurred within these zones of influence along roads and trails or around human settlements. Gibeau and Stevens (2005) documented bears further from roads when distant from high quality habitat, indicating avoidance behavior.

Research suggests that grizzly bears benefit from road closures aimed at minimizing traffic on roads within important seasonal habitat, especially in low elevation habitats during the spring (Proctor et al. 2019, McLellan 2015, Mace et al. 1999). Proctor et al. (2019) described management of motorized access as most beneficial in areas where roads occur in high quality habitat, especially within an adjacent to linkage areas between population units. McLellan (2015) found that the location of motorized routes relative to bear food sources was important and recommended that managers attempt to maintain or enhance high-energy foods while reducing human access into specific areas where and when those foods are abundant (seasonal habitat). When roads are located in important habitats such as riparian zones, snowchutes, and shrub fields, habitat loss through avoidance behavior can be significant. Mace et al. (1996) found that most of the roads within grizzly bear seasonal ranges were either closed to vehicles or used infrequently by humans. Some grizzly bears avoided areas with a high total road density even when the roads were closed to public travel. If human-related disturbances such as high levels of road use continue in preferred habitats for extended periods of time, grizzly bear use of the area may be significantly limited, particularly use by female grizzly bears. In the Swan Mountain study (Mace et al. 1996), female grizzly bear home range selection of unroaded cover types was greatest and as road densities increased, selection declined. Zager (1980) reported the underuse of areas near roads by females with cubs. Aune and Kasworm (1989) found that female cubs generally established their home range within or overlapping with their mother's home range, whereas males generally dispersed from their mother's home range. Long-term displacement from a portion of her home range may result in long-term under-use of that area by female grizzly bears. Because cubs may have limited potential to learn to use the area, learned avoidance behavior could persist for more than one generation of grizzly bears before grizzly bears again utilize habitat associated with closed roads. Thus, displacement from preferred habitats may significantly modify normal grizzly bear behavioral patterns.

Conversely, grizzly bears can become habituated to human activity and show a high level of tolerance especially if the location and nature of human use are predictable and do not result in overtly negative impacts for grizzly bears (Mattson 1993). 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. Both Mattson (1993) and Yonge (2001) postulated that areas with higher levels of human activity might have a positive effect for bears by serving as a kind of refugia for weaker population cohorts (subadults and females with cubs) seeking to avoid intra-specific competition (adult males). However, Mattson qualified this observation by adding that the beneficial effects vary as to whether hunting is allowed, and how closely the human population is regulated. Further, food conditioned grizzly bears were much more likely to be killed by humans.

Both Yonge (2001) and Mattson (1993) indicated that increases in human use levels can be deleterious if some human activities are unregulated, such as use of firearms, presence of attractants, nature and duration of human uses. Conversely, a level of coexistence between

humans and grizzly bears can be achieved if such activities are controlled. Near Cooke City, Montana, the New World Mine reclamation project had minimal effects on grizzly bears, in part because reclamation activities were temporally and spatially predictable and people associated with the work were carefully regulated against carrying firearms or having attractants available to grizzly bears (Tyers, unpublished 2006). In the Swan Valley of Montana, raw location data from a small number of collared grizzly bears show nocturnal use of highly roaded habitat (C. Servheen, U.S. Fish and Wildlife Service, pers. comm. 2005). The Swan Valley data have not been statistically analyzed and the study was not designed to determine the impact of roads on bears, sample size is very small, and perhaps most importantly, mortality rates for these grizzly bears are not yet known. However, these data indicate that some grizzly bears can apparently habituate to relatively high levels of human activity.

It appears that some bears have adapted to the types of habitat and relatively low levels of security near human developments as compared to more remote areas. In particular, Ruby (2014) found that bears that used areas near roads and human development did so when human use was low, such as at night, and that bears rested less in these areas than in areas away from roads and human development. Northrup et al. (2012) looked at various levels of road use (low, medium and high) and found that during the day bears avoided crossing roads of all use levels, however the higher the use level the more likely avoidance occurred. Low volume routes were crossed during both day and night hours. In fact, at night, bears selected to cross low traffic volume roads at greater frequency than random.

Specific causes or factors involved in the selection or preferences for certain home ranges by grizzly bears are not well understood. Mace and Manley (1993) found that grizzly bear home ranges in the South Fork Study area included remote areas in high elevations. South Fork Study grizzly bear habitat-use data, road density analyses of the South Fork Study area, previous studies and CEM analysis (U.S. Forest Service 1994, Mace et al. 1999) suggested that low-elevation habitats were not freely available to grizzly bears because of high road densities and associated human use in these areas. High road densities in low-elevation habitats may result in avoidance of or displacement from important spring seasonal habitat for some grizzly bears. High road densities in and off themselves do not result in mortality but a mortality risk may occur for those individuals that venture into and attempt to exploit resources contained in these low-elevation areas.

Male grizzly bears typically have larger home ranges than females, and males, subadults, and transient grizzly bears are more mobile and do not have the same energetic needs as adult females. Transient individuals are highly mobile and not restricted to finding food and shelter within a home range. Thus, while displacement from habitat along roads 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 these behavioral patterns of transient, subadult, or male grizzly bears. Where road densities are high enough to result in significant displacement effects, non-lethal impairment to behavioral patterns of adult female grizzly bears may occur.

Secure Core/secure habitat. Ideal grizzly bear habitat provides some areas isolated from high levels of human impact. Studies have shown that female grizzly bears selected for, and survived better in, areas with greater secure habitat (Proctor et al. 2019). Analysis in the South Fork Study area (Mace and Manley 1993, Mace et al. 1996) indicated the importance of unroaded habitat, especially for females with cubs. Mace and Manley (1993) reported adult females used

habitat further than 0.5 mile from roads or trails more than expected; 21 percent of the composite home range had no trails or roads and 46 percent was unroaded (greater than 0.5 mile from a road). Substantive blocks of unroaded habitat were components of all adult female home ranges. Of the adult female locations within unroaded polygons, 83 percent occurred within 7 polygons that exceeded 2,260 acres in size (*Ibid*.). Based on grizzly bear habitat use data from the Yellowstone ecosystem, secure habitat and road densities outside of secure habitat were important predictors of grizzly bear survival (Schwartz et al. 2010).

The IGBC Taskforce (IGBC 1994, 1998) recognized the importance of secure areas to grizzly bears. The Taskforce defined "core areas" within the recovery zones as those areas with no motorized use of roads and trails (during the non-denning period) or high intensity, non-motorized use, providing some level of secure habitat for grizzly bears. Motorized use, such as snowmobiling or that associated with timber harvest, could occur within core areas during the denning (winter) period. The Taskforce recommended the establishment of core areas in all subunits within the recovery zones. Core areas within recovery zones should be a minimum of 0.31 mile from any open road or motorized trail, with the size and connectivity of core area patches being established by recovery zone, depending on ecosystem-specific habitat conditions. Once established and effective, core areas should remain intact on the landscape for at least 10 years (*Ibid*.). In the South Fork Study area of the NCDE, approximately 68 percent of the adult female composite home range was core area (U.S. Forest Service in litt. 1994, K. Ake, U.S. Forest Service, pers. comm. 2005).

Habituation to Human Attractants. Continued exposure to human presence, activity, noise, and other elements can result in habituation, which is essentially the loss of a grizzly bear's natural wariness of humans. High route densities and associated increases in human access into grizzly bear habitat can lead to the habituation of grizzly bears to humans. Habituation in turn increases the potential for conflicts between people and grizzly bears. Habituated grizzly bears may obtain human food or garbage and become involved in nuisance bear incidences, and/or threaten human life or property. Such grizzly bears generally experience higher mortality rates as they may eventually be removed from the population through management actions. Habituated grizzly bears are also more vulnerable to illegal killing because of their increased exposure to people. In the Yellowstone region, humans killed habituated grizzly bears over three times as often as non-habituated grizzly bears (Mattson et al. 1992).

Subadult grizzly bears are more often vulnerable to habituation and illegal killing or they conflict with people and are removed through management action. Subadult grizzly bears frequently traverse long distances or unknown territory, increasing the likelihood of encountering roads, human residences or other developments where human food or other attractants are available, increasing the potential for habituation and/or conflicts with people. In the Yellowstone ecosystem, roads impacted individual age and sex classes of grizzly bears differently. Subadults and females with young were most often located near roads, perhaps displaced into roaded, marginal habitat by dominant grizzly bears (Mattson et al. 1987, Mattson et al. 1992).

While management actions of grizzly bears due to human food habituation do occur, such actions are infrequent to none on many areas of Forest Service administered lands as a result of food storage orders that are in place. On Forest Service administered lands, grizzly bear mortalities more often resulted from mistaken identity during legal hunting season, illegal or malicious killing, or automobile and train collisions (K. Ake 2011 *in litt.*).

Grizzly Bear Mortality. While grizzly bear mortality may occur as a result of collisions with motorized vehicles, such mortality is more likely to occur on motorized routes where motorized use occurs at high speed as opposed to Forest roads. Aside from grizzly bears killed by vehicle collision, the specific relationship between roads and the mortality risk to grizzly bears is difficult to quantify. The level of human use of roads is one of several factors influencing the mortality risk associated with any road. Research supports the premise that forest roads facilitate human access into grizzly bear habitat, which can directly or indirectly increases the risk of mortality to grizzly bears (Proctor et al. 2019, Mattson et al. 1992, McLellan and Shackleton 1988, Mace et al. 1987, Dood et al. 1986).

The presence of Forest roads alone does not necessarily result in direct mortality of grizzly bears, but the proximity of the roads to human population centers, resulting in high numbers of people using roads, and dispersed recreation in habitat around roads can pose considerable risks to grizzly bears. Social values and attitudes also contribute to the level of mortality risk to grizzly bears. Access management can be instrumental to reducing mortality risk to grizzly bears by managing the present and anticipated future road use-levels resulting from the increasing human population in western Montana. Potential grizzly bear mortality near roads is typically the result of intentional (self-defense, defense of life, poaching, etc.) or unintentional (mistaken identity) shootings. Whether illegal or not, these type of mortalities are not part of the Forest's proposed action and are not the focus of this revised biological opinion. Thus, any effects are not exempted under this revised biological opinion. Similar to illegal access of motorized routes, effects to grizzly bears related to mortality are reasonably uncertain. It is unknown as to when and where such mortality may occur. As such, the Service and the Forest are not able to calculate the extent of effects to individual grizzly bears. However, while such mortality may occur at times, effects of these intentional and unintentional grizzly bear mortalities are likely low as evidenced by the NCDE grizzly bear population status, including an increasing number of grizzly bears, an expansion of the distribution of grizzly bears, and an estimated positive population trend.

General effects of Winter Motorized Use on Grizzly Bears

Available information regarding the effects of snowmobiles on grizzly bears is generally anecdotal, such as grizzly bear responses to various stimuli other than snowmobiles collected during research. Such reports typically lack information related to the timing of disturbance, type of den, winter conditions or other important factors necessary to assess the significance of disturbance to grizzly bears, if any. Some information collected on black bears or other ursids may have some relevance, but even the data on these species is incidental and largely theoretical.

In the fall of 2000, the science and resource management staff of the Biological Resources Management Division of the National Park Service and the Rocky Mountains Cooperative Ecosystem Studies Unit at the University of Montana organized an expert workshop to summarize the state-of-science on monitoring the effects of snowmobiles on wildlife in national parks and surrounding lands. Graves and Reams (2001) edited the output of this expert workshop for protocols to monitor snowmobile effects on wildlife. The group concluded that the evidence was inadequate to predict impacts on grizzly bears, but the *possible* effects were identified: den abandonment, loss of young, increased energetic costs while bears were in dens or displaced away from suitable habitat if outside dens, death, and learned displacement from

suitable habitat resulting from exposure to disturbance (Graves and Reams 2001). Impacts to emergent bears were identified as a higher concern than impacts to denning bears.

Typical high-use snowmobile areas and potential den sites have a limited likelihood of substantive overlap. Grizzly bears generally den in either timbered habitat or very steep slopes, including the slopes of open basins. Most of the heavy snowmobile use occurs on trails, roads, or open basins and meadows. Although some snowmobile riders use steep open basins for "high marking", in which case the potential for direct overlap between denning habitat and steep open slopes favored for "high marking" by snowmobiles may occur. However, most denning habitat, except for "high-marking" areas, is less favorable for snowmobile use and as such the chance of adverse overlap between grizzly bear den sites and snowmobile traffic is reduced.

Snow is an excellent sound barrier (Blix and Lentfer 1992) and impacts to denning bears would likely be less in deep snow conditions 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). Reynolds et al. (1986) found that some bears, on occasion, appear to respond to noise or disturbance near the den site by waking up and moving around the den. On rare occasions, bears may abandon a den due to some disturbance (Reynolds et al. 1976, Swenson et al. 1997). However, den abandonment attributed to snowmobiles has not been documented.

The noise and human activity related to snowmobile use would likely impact grizzly bears most during the early and late denning period, or when snow levels are low and the snowmobile activity is near the den site. However, the early and late denning periods are times when snow conditions are least conducive to snowmobile activity. If disturbance occurred early during the denning season, a bear would likely have other denning habitat available. Grizzly bears are unlikely to abandon their dens very late into the winter due to the high energetic and fitness costs of doing so (Linnell et al. 2000). Theoretically, as the costs of abandoning a den and re-locating to another den increase, grizzly bears should be expected to tolerate greater levels of activity without abandonment.

Disturbance from snowmobiles is likely most consequential shortly before or after den emergence of a female with cubs. Most emerging bears move immediately to a known, reliable spring food source, such as a big game winter range (Reinhart and Tyers 1999). Females with cubs have high energetic needs, and cubs have limited mobility for several weeks after leaving the den, therefore they remain in the den site area for several weeks after emergence from dens (Haroldson et al. 2002; Mace and Waller 1997). Researchers involved in the 2000 workshop assessing snowmobile impacts (Graves and Reams 2001) indicated higher concerns with emergent females with cubs as they are likely the most sensitive to disturbance (Haroldson et al. 2002). Disturbance levels that cause a female to prematurely leave the den in spring or move from the den area could impair the fitness of the female and safety of the cubs. If cubs attempt to follow their mother, they would likely experience decreased fitness and the family group may be pushed to less suitable habitat. A disturbance would have to be severe for a sow to abandon her cubs (Linnell et al. 2000). In the judgment of the Service, snowmobile-related impacts on post-den emergence females with cubs are more likely to impart serious consequences than any potential impacts to denning grizzly bears.

Changing snow conditions in spring may help reduce the probability grizzly bears being impacted by snowmobiles. At the time of emergence, snow conditions are changing rapidly. The same conditions that help lead to bear emergence (e.g., water infiltrating the den) (Schoen et al. 1987; Craighead and Craighead 1972) lead to poor quality snow for snowmobiling. At that time, snow is melting at lower elevations, making access to higher elevations more difficult for snowmobilers. In general, female grizzly bears with cubs emerge later in the season, when these snow and melt conditions are even more prevalent. Individual circumstances of access and allowable seasons are important variables to analyzing effects of snowmobiles to grizzly bears.

Effects of Motorized Access in the Action Area

The action area occurs both inside and outside of the NCDE grizzly bear recovery zone, in areas where grizzly bears may be present. Tables 1 and 2 above display the existing OMARD, TMARD, and secure core for the subunits within the recovery zone and secure habitat for the GBAUs outside of the recovery zone, respectively, within the action area. Portions of the action area have high levels of motorized access while other portions have low levels of motorized access or no motorized access at all. The existing conditions within the subunits in the recovery are not expected to result in ongoing significant effects to grizzly bears. Outside of the recovery zone, the estimated amount of secure habitat ranges from a low of 4 percent in the Sheep Creek GBAU to a high of 62 percent in the Highwoods GBAU. Of all 21 GBAUs, 1 has less than 10 percent secure habitat, 2 have between 11 and 20 percent secure habitat, 5 have between 21 and 30 percent secure habitat, 5 have between 31 and 40 percent secure habitat, 3 have between 41 and 50 percent secure habitat, 3 have between 51 and 60 percent secure habitat, and 2 greater than 60 percent secure habitat. It is likely that portions of all or most of the GBAUs have existing conditions that may be resulting in ongoing significant effects to grizzly bears if or when females grizzly bears are present.

As previously stated, due to some concerns with the access data in portions of the action area outside of the recovery zone and in order to be conservative when analyzing effects, all existing routes are buffered when delineating secure habitat outside of the recovery zone, regardless of whether they are legally open or restricted to public travel. As such, the estimates of secure habitat displayed in Table 2 above are in most cases underestimates of actual secure habitat that exists on the ground because an unknown number of routes that are physically impassable to motor vehicle use have not been updated within the access database and thus, were excluded from secure habitat polygons. In addition, since the Forest has no management authority over non-Forest lands, lands not administered by the Forest were also buffered out of the secure habitat analysis. While it is possible that non-Forest land may provide secure habitat, such information is often unknown and the Forest lacks management authority over non-Forest lands. Thus, to be conservative when analyzing effects to grizzly bears, so as to not miss any potential effects, non-Forest land is buffered out of the secure habitat metric and the secure habitat analysis includes only secure habitat on Forest land. Accordingly, the secure habitat amounts provided are useful mainly as a broad index of what may be available to grizzly bears that may use the action area outside of the recovery zone.

The existing access conditions were determined using the best available information. The metrics described here represent the existing access condition as reviewed, although the Service recognizes that improved information may be documented and mapping and calculation errors can occur. The Forest is expected to update the secure habitat metrics as they update their access

data during site-specific project planning. These updates are not a result of changes on the ground. As the access database is updated, the improved information will better reflect the existing conditions related to secure habitat in the GBAUs. If the Forest finds that it has new information or has made a mapping or calculation error in describing the existing condition and corrects the metrics, the Service does not expect any additional effects to grizzly bears related to those corrections because no actual changes occurred on-the-ground. The intent of this analysis is to capture the existing access conditions and the potential effects to grizzly bears, including potential ongoing effects that may not be represented in the metrics described above due to potential errors. If however, changes in the metrics occur due to Forest actions on-the-ground, site-specific analyses would need to occur to determine the potential effects.

The mileage, location, and timing of public motorized travel across the Forest is determined by travel plans, which are already in place and will not change as a result of the 2021 Forest Plan. In addition, the requirements included in the NCDE grizzly bear amendments will be carried forward into the 2021 Forest Plan. For example, PCA-NCDE-STD-03 relates to the baseline motorized access conditions and would result in no net decrease in secure core and no net increase in OMARD or TMARD within the recovery zone. Z1-NCDE-STD-01 states that there shall be no net increase above the baseline in density (linear route density) of motorized routes open to public motorized use within NCDE zone 1.

Thus, current OMARD, TMARD, and secure core in the recovery zone would be maintained. Outside of the recovery zone, open linear route density within NCDE zone 1 would be maintained, however the standard does not apply to secure habitat. Since the 2011 baseline must be maintained, in order to construct permanent roads in these areas (not related to the limited allowable circumstances described below), other roads would likely need to be decommissioned. However, such a change could result in effects to secure habitat. Access management within these areas would be monitored and compared with the 2011 baseline motorized access conditions, as described in the NCDE conservation strategy. Several situations may not apply to maintaining the 2011 baseline and could result in a change to road density in NCDE zone 1 such as: acquiring or exchanging land; compliance with federal law; motorized use related to mining activities; grizzly bear-human conflicts, resource damage, or human safety concerns; emergency situations; and temporary roads for the development, construction, or staging of a project or event that has a finite lifespan. Effects associated with any of these situations would be evaluated in a site-specific analysis, as appropriate. The existing motorized access conditions throughout the action area, including the recovery zone and NCDE zones 1, 2, and 3, may result in some level of ongoing affects, including some adverse effects, which may continue during the life of the 2021 Forest Plan.

As previously mentioned, permanent route construction within the recovery zones and NCDE zone 1 is limited by standards. Since the 2011 baseline must be maintained, in order to construct permanent routes in these areas (not related to the limited allowable circumstances described for NCDE zone 1), other roads would likely need to be decommissioned. Permanent route construction is not limited within NCDE zones 2 and 3 of the Forest. The Forest expects that it is likely that a decrease in miles of permanent roads would actually occur over the life of the 2021 Forest Plan (U.S. Forest Service 2020). Any new permanent roads are likely to replace old roads that would subsequently be obliterated. Also, many of the existing roads that are no longer needed would continue to be removed from the landscape. Thus, it is likely that in most situations new permanent road construction would not result in a net increase in permanent road

miles. While unlikely, permanent road construction is allowed in NCDE zones 2 and 3 and may result in some level of effects, including the potential for adverse effects.

The potential effects of permanent route construction on secure habitat depend entirely on the location of the new route and the existing secure habitat polygons. For example, a permanent road could be constructed completely outside of secure habitat, as well as the 500 meter buffer, and would have no effect on secure habitat. A different example could include permanent route construction through the middle of a secure habitat polygon, potentially resulting two polygons of habitat that no longer provide secure habitat (depending on size, etc.). Other examples of permanent route construction would result in effects that fall somewhere in between these two examples. Thus, we cannot reasonably estimate the impacts that future permanent motorized route construction would have on secure habitat and site-specific analyses would need to occur for any permanent motorized route construction that may be proposed in the future.

Vegetation management actions often require the construction and use of temporary roads or temporary use of restricted roads for motorized access. While not specifically proposed under the 2021 Forest Plan, temporary road construction and use and temporary use of restricted roads may occur on a project by project basis. Temporary roads built for resource extraction such as timber harvest or mining may be short-term in duration of use or may remain on the landscape for several years and receive a substantive amount of use.

The 2021 Forest Plan (by incorporating the NCDE grizzly bear amendments (NCDE conservation strategy)) establishes standards that would apply to the use of temporary routes for project implementation within the recovery zone that may temporarily impact OMARD, TMARD, and secure core (PCA-NCDE-STD-04). The standard allows projects to temporarily increase OMRD by 5 percent, temporarily increase TMRD by 3 percent, and temporarily decrease secure core by 2 percent. PCE-NCDE-STD-01 requires that in each subunit, temporary changes in OMARD, TMARD, and secure core shall be calculated for roads used for projects during the non-denning season. Calculations will include estimated changes for each year of the anticipated duration of the project and shall be incorporated into the 10-year running average required by standard NCDE-STD-AR-03.

Also within the recovery zone, PCA-NCDE-STD-02 requires that administrative use on roads with public restrictions does not exceed either 6 trips (3 round trips) per week or 1 thirty-day unlimited use period during the non-denning season. Exceptions to this standard include emergency situations. PCA-NCDE-STD-05 would allow temporary use of restricted roads for motorized use by the public for special purposes such as firewood gathering. The standard also indicates that motorized public use in these areas will not last longer than 30 days, and will only occur outside the spring and fall bear hunting seasons. Further, public motorized use would not be permitted within secure core. Thus, the amount and duration of disturbance associated with this use would be limited.

Temporary road construction and/or use within the recovery zone would be managed via these standards and would be expected to meet these standards. Guidelines are also provided to minimize the potential effects of temporary project implementation within the recovery zone. Temporary project implementation within the recovery zone should not exceed 5 years (PCA-NCDE-GDL-01). Further, guideline PCA-NCDE-GDL-02 ensures that pre-project conditions (i.e., OMRD, TMRD, secure core) would be restored within 1 year of project completion. While

projects meeting these guidelines may result in some adverse effects to grizzly bears as a result of displacement from preferred habitat, they would provide limits on the amount and duration of the disturbance so that bears are not permanently displaced by human activities. While the 2012 planning rule allows the Forest to deviate from guidelines so long as they meet the purpose of the guidelines, it is not known at this time what other scenarios may be used to meet the purpose of these guidelines. Thus, these guidelines, as written, will be used for the effects analysis. If the purpose of the guidelines are met in a different way, site-specific consultation may be necessary depending on the site-specific information and effects.

Depending on the location, timing, and duration, the allowance of temporary changes in access conditions within the recovery zone may result in some level of effects, including the potential for adverse effects to grizzly bears through increased displacement. Such effects would depend on the existing access condition of the project subunit and the potential temporary effects to the access metrics. The extent of area on the Forest that could be affected is limited. While temporary decreases in secure core would be allowed, the ability to conduct projects within secure core will be constrained in most areas by overlapping designated wilderness, proposed wilderness, inventoried roadless areas, and other forest plan management area designations that restrict road development. The Forest has about 845,000 acres of secure core, of which about 821,000 acres are in wilderness or roadless areas (97 percent), meaning that only approximately 3 percent of the Forest's secure core occurs in areas that even allow road access. Further, the Rocky Mountain Front Heritage Act described above will continue to limit construction and use of temporary roads.

The amount of temporary road outside of the recovery zone, within NCDE zones 1, 2, and 3, is not limited. The Forest looked at vegetation management projects over the past 8 years within NCDE zones 1, 2, and 3 and found that approximately 98 miles of temporary roads were constructed or proposed to be constructed. With all but 4 miles occurring outside existing secure habitat, the analysis showed that most temporary roads tend to occur in proximity to existing motorized routes and not within 500 meters of secure habitat. Based on this analysis, the effects of temporary project roads (new construction or use of restricted roads) would not likely be separate or distinguishable from the effects of the existing motorized access conditions already on the landscape. Using this information, the Forest estimated that secure habitat may be temporarily impacted by the construction of temporary project roads or temporary use of restricted roads by an average of 2.5 percent and no more than 7 percent at any given time in any individual GBAU over the life of the 2021 Forest Plan. The temporary changes in the effectiveness of secure habitat, which may occur during implementation of vegetation management projects, would not likely occur in more than six GBAUs in total during that time and likely in no more than two adjacent GBAUs concurrently. Such impacts would be localized and likely separated in space and time. Effects could range from minor disturbance to displacement of grizzly bears that may be adverse.

The effects of displacement and under-use of habitat related to motorized access (including the existing motorized access conditions and the potential temporary road construction and use and temporary use of restricted roads) are tempered by local resource availability, resource condition, seasonal use, and the number of grizzly bears using an area. Currently, the number of grizzly bears using the action area varies, with use ranging from higher in the recovery zone and NCDE zone 1 to very low or none in portions of NCDE zones 2 and 3. Adverse effects from existing low amounts of secure habitat in some portions of the action area or temporary effects to secure

habitat may result in the displacement of individual grizzly bears, the avoidance of suitable habitat, and/or the reduction of habitat to an unsuitable condition. Under-use of habitat in proximity to roads by grizzly bears does not necessarily preclude use or form a barrier to dispersal and movement across the landscape.

At this time, within some portions of NCDE zones 2 and 3, grizzly bears have not been verified in several GBAUs. In addition, in some GBAUs where transient males have been verified, no female grizzly bears have been verified. The existing, baseline motorized access conditions may result in some level of adverse effects to individual female grizzly bears if and when they occur in these GBAUs. Numbers of grizzly bears in NCDE zones 2 and 3 are expected to increase slowly over time. This is especially true for female grizzly bears. As mentioned earlier, Proctor et al. (2012) found males move more frequently and over longer distances than females. Males have large home ranges and establish home ranges nearly three times further away from their mother's home ranges than do female offspring. Females usually establish smaller home ranges than males that overlap with their mother's home range (Waser and Jones 1983; Schwartz et al. 2003). In doing so, they generally disperse over much shorter distances than male grizzly bears (McLellan and Hovey 2001; Proctor et al. 2004). Therefore, female dispersal is a multi-generational process where females must live year-round in an area, successfully reproduce, and offspring disperse into adjacent, unoccupied habitat. Thus, female grizzly bear presence in portions of the action area is likely to increase slowly, only if and when population pressure from the NCDE grows. The earliest detections of grizzly bears from the NCDE found in the intervening area between the NCDE and the YBGE were male, and males make up most of the known occurrences in this region (Mace and Roberts 2012). Until numbers substantially increase, grizzly bears now occupying or moving into the NCDE zones 2 and 3 portions of the action area in the near future would not likely face significant competition for habitat and resources from other grizzly bears and displacement from quality habitat is not as likely to result in adverse effects to individuals as they are likely to have options to move to other areas to find resources.

Male grizzly bears have larger home ranges than females, and males and subadults are independent, more mobile and do not have the same energetic needs as adult females. While displacement may affect behavioral patterns of males and subadults, such as feeding or sheltering, we do not anticipate such effects to be significant to subadult or male grizzly bears. Displacement from quality habitat has more significant impacts on adult female grizzly bears than males or subadults because adult females have higher energetic needs to sustain fitness prior to and during gestation and lactation and when rearing. As such, adult females can less afford the additional energy expended to find high quality foods and shelter if displaced, especially during the early spring or late summer to fall hyperphagia season. During some years, due to poor climatic conditions and resulting food scarcity and/or high levels of forest management activity or recreational activity, displacement effects from areas with high road densities could be more frequent and intense.

Depending on the site specific information regarding the existing motorized access conditions, temporary roads, and temporary use of restricted road the Service anticipates that some level of adverse effects to female grizzly bears with home ranges impacted by such roads may occur in some situations during the life of the 2021 Forest Plan. Some adult females may be displaced from key habitats and under certain conditions they may be displaced to levels that impair their normal ability to readily find food resources needed to sustain fitness necessary for breeding and

producing cubs, and find shelter. We do not expect that all existing roads, temporary roads, or temporary use of restricted roads would have adverse impacts on female grizzly bears, or that all female grizzly bears would be adversely affected by these roads. The level of effects would depend on such things as grizzly bear use in the action area, location of the road, length of the road, timing of use, the frequency and intensity of use, and the duration the road would be on the landscape, in relation to those factors listed above for effects of roads. Not all temporary roads would likely to be constructed at once. Some of the roads would be consolidated in project areas and be constructed and used at the same time, which would concentrate effects on bears into a smaller area. Other roads would be separated by space and time across the Forest, which may affect more individual grizzly bears, but have less intense effects. However, if under-use of key feeding and sheltering habitat by female grizzly bears is significant, they may fail to obtain the necessary resources to breed and successfully reproduce.

For the GBAUs lacking grizzly bear use, especially female grizzly bear use, we do not expect adverse effects associated with motorized access at this time. Until such time that female grizzly bears begin to use these GBAUs, the existing motorized access conditions are not likely resulting in adverse effects to grizzly bears. We conservatively include the potential for adverse effects in these areas due to the long time-frame that the 2021 Forest Plan will be effective, during which some females may begin to use these GBAUs and experience adverse effects from the ongoing motorized access conditions and low amounts of secure habitat and/or temporary roads or temporary use of restricted roads.

In sum, existing motorized access conditions, temporary roads constructed and used, and/or the temporary use of restricted roads may affect grizzly bears. These affects may be insignificant in some situations or adverse in others. Adverse effects may significantly impact an adult female grizzly bears' ability to find food resources, breed and raise young, and find adequate shelter at some time over the life of the 2021 Forest Plan. Not all actions related to access under the 2021 Forest Plan will result in adverse effects. We anticipate that the adverse effects from existing motorized access conditions, temporary road construction and use, and temporary use of restricted roads would affect only few adult females over the life of the 2021 Forest Plan. Further, we do not expect that all adult females exposed to disturbances related to motorized route densities would suffer significant effects, nor would the effects persist throughout an individual female's life span. We expect that effects would vary substantially depending upon the wariness of the individual bear, the size of and habitat quality within her home range, the number of other grizzly bears using the particular area, climate conditions, annual food resources, and the nature, intensity and duration of human activity during any particular year. All of these are factors that may affect options available to adult females if displaced. Further, conditions the following year may be considerably different.

Winter Motorized Use

We do not anticipate adverse impacts to grizzly bears as a result of the 2021 Forest Plan for non-motorized use during the winter. The primary concerns with winter motorized use with respect to grizzly bears are the potential effects associated with denning, den emergence, and spring habitat. Summer and fall habitats are not at issue since snowmobiling would not overlap with these seasons. Winter recreation primarily occurs during the grizzly bear denning season. The mileage, acreage, location, and timing of winter motorized over-snow travel is determined by the travel plans, which are in place across the Forest and will not change as a result of the 2021

Forest Plan. Thus, the amount and timing of winter motorized use would remain the same under the 2021 Forest Plan as the existing, baseline condition. Late season snowmobile use is not restricted in all portions of the action area and in some portions of the action area winter motorized use would extend beyond the April 1 grizzly bear spring emergence period. The Forest and Service previously consulted on the Blackfoot-North Divide winter travel plan, which included an analysis on late season winter motorized use (U.S. Fish and Wildlife Service 2010a). As mentioned, this opinion on the 2021 Forest Plan supersedes the 2010 biological opinion on the Blackfoot-North Divide Winter Travel Plan.

Under the existing condition, more than half (approximately 56 percent) of the action area within the recovery zone is within designated wilderness, where over-the-snow motorized travel is prohibited. Within the Rocky Mountain Range GA, winter motorized travel is allowed only on main access roads (none of which are within modeled grizzly bear denning habitat) and approximately 30,000 acres (approximately 8,000 acres overlap with modeled denning habitat). Thus, the snowmobile use within denning habitat in the Rocky Mountain Range GA is limited to relatively small portions of four subunits (Teton, Pine Butte, West Fork Beaver, and South Fork Willow). Snowmobile use within the Rocky Mountain Range GA is prohibited after March 31.

Within the Upper Blackfoot GA, snowmobiling is allowed on about 53,000 acres (approximately 6,400 acres overlap with modeled denning habitat) within the recovery zone. This snowmobile use occurs within all three subunits within the Upper Blackfoot GA (Alice Creek, Arrastra, and Red Mountain). Snowmobile use within the recovery zone portion of the Upper Blackfoot GA is prohibited after March 31 with the exception of the Copper Bowls play area where snowmobile use is allowed until May 31. The Copper Bowls play area does not affect OMARD because the access to this area is on a yearlong open road. No restricted roads are used to access this extended use area. Within the Copper Bowls extended use area, 1,891 acres are designated as secure core, consequently resulting in a decrease in the effectiveness of secure core during a small portion of the non-denning period (from April 1 up to May 31). Although these 1,891 acres of secure core in the Copper Bowls extended use area may be compromised for a short period of time, they remain designated as secure core and will continue to provide secure core during the remainder of the non-denning period. Within the Copper Bowls extended use area, approximately 691 acres overlap with modeled denning habitat.

The NCDE grizzly bear amendment, which will be incorporated into the 2021 Forest Plan, included a plan component to cap the amount of area available to motorized over-snow travel in modeled denning habitat within the PCA (recovery zone) during the den emergence period. No net increase in the percentage of area or mile of routes designated for motorized over-snow vehicle use can occur on the Forest within the recovery zone during the den emergence time period.

Within the portion of the action area outside of the recovery zone, the timeframe for winter motorized use varies. In the portion of the Upper Blackfoot GA outside of the recovery zone and north of Highway 200 (specifically within portions of the Dalton Mountain GBAU) areas open to snowmobiling through March 31 occur on approximately 1,800 acres. This use overlaps with approximately 4 acres of modeled denning habitat. Elsewhere in the Upper Blackfoot GA in areas south of Highway 200 (including portions of Dalton Mountain and Humbug GBAUs) areas are open to snowmobiling through April 15 on approximately 70,000 acres; roughly 7,600 of those acres overlap modeled denning habitat.

For the GBAUs across the remaining portions of the Forest, the dates during which over-snow motorized travel is allowed vary from yearlong to ending on May 15. Snowmobile use that extends beyond March 31 overlaps with approximately 112,535 acres of modeled denning habitat. Many areas on the Forest are relatively dry and snow can be intermittently present. Thus, not all areas legally open to over-snow motorized travel are actually available during the entire time they are open.

For those areas where winter motorized use does not occur beyond March 31, effects would be insignificant. The effects of winter motorized use beyond March 31 in those areas that overlap denning habitat are discussed below in the denning habitat, den emergence, and spring habitat sections.

Denning Habitat

As discussed in the 'general effects of snowmobiles on grizzly bears' section above, the potential for disturbance to denning grizzly bears does exist but is probably low due to the low probability of a direct encounter of a snowmobile to a den and even in that unlikely case, the excellent insulative properties of snow to mitigate the noise. It is more likely that impacts to denning grizzly bears, if they were to occur, would occur upon den emergence as discussed below. Therefore, although some grizzly bears may be affected during the denning season, the Service believes that the magnitude of impacts during this time would not reach levels that would injure grizzly bears, or be expected to appreciably reduce the reproduction, numbers or distribution of grizzly bears.

Den Emergence

To review, female grizzly bears begin emerging from their dens about April 1, with males typically beginning to emerge about 2 weeks earlier (Mace and Waller 1997). Grizzly bears typically spend a few days to a few weeks at or near the den before moving to other locations to begin feeding. During this time the grizzly bears have been observed to be lethargic and approachable. After leaving the den site grizzly bears usually move to lower elevation habitats such as riparian areas and avalanche chutes for much of their foraging during spring (Mace and Waller 1997). Based on the behavior of grizzly bears in response to motorized use of roads in Mace and Waller's (1997) study, snowmobile activity after den emergence dates could disturb and/or displace grizzly bears. The greatest probability of interactions at or near dens would obviously be expected where modeled denning habitat overlaps with open snowmobile areas and the influence zones around roads or routes. As discussed in more detail below (under *spring habitat*), once grizzly bears move away from den sites and toward spring habitats, there will be very little potential for conflict with snowmobiles.

Snow conditions within portions of the action area are often suitable for snowmobiling well beyond April 1, the date grizzly bears generally begin emerging from their dens. This is true especially in the higher elevations within the recovery zone. However, under the existing travel plans that would not change under the 2021 Forest Plan, areas with extended winter motorized use seasons (after April 1) would occur. Therefore, the potential exists for interactions between snowmobiles and grizzly bears that have recently emerged from their dens. As previously mentioned, approximately 691 acres of denning habitat overlap areas open to late season (after March 31) winter motorized use within the recovery zone. Outside of the recovery zone, approximately 120,135 acres of denning habitat overlap areas open to late season winter

motorized use. However, for reasons previously mentioned, not all areas legally open to over-snow motorized travel are actually available during the entire time they are open.

Disturbance from snowmobiles is likely most consequential shortly before or after den emergence, particularly to females with cubs. Females with cubs have high energetic needs in the spring, and cubs have limited ability to travel for several weeks after emergence from the den. Disturbance levels that cause a female to prematurely leave the den in spring or move from the den area could impair the fitness of the female and safety of the cubs. If cubs attempt to follow their mother, they may experience some level of decreased fitness and the family group may be pushed to less suitable habitat. Thus, significant disturbance during this time may reach levels that would injure grizzly bears, specifically adult females with cubs. Based on naturally earlier den emergence of male bears and females without young and their independence and mobility, the Service does not anticipate the effects of disturbance caused by snowmobiles would be adverse to male grizzly bears or female grizzly bears without cubs.

Spring Habitat
Upon emergence from their dens in the spring, grizzly bears typically move to lower elevations where their dietary needs may be met. Typical spring food sources include early greening herbaceous vegetation in low elevations, riparian areas, and in melted-out avalanche chutes. Grizzly bears also feed on dead ungulates from winter kill on winter ranges and in some locations grizzly bears prey on elk calves (usually available after June 1).

As reported earlier, timing of den exit by grizzly bears was similar between the major studies in the NCDE: median date of exit was April 7 on the east side (Aune and Kasworm 1989); April 14 in the Swan Mountains (Mace and Waller 1997), and early April in the Mission Mountains (Servheen and Klaver 1983). Females with cubs (those pregnant upon den entry – as opposed to females with young who enter their dens with cubs-of-the-year or older) emerge later than other sex and age classes (Aune and Kasworm 1989; Mace and Waller 1997). Females with newly born cubs also spent more time in the vicinity of the den (with cubs) after emergence.

The potential for disturbance or displacement of grizzly bears from spring feeding habitat in the action area is influenced by the variability in snowpack and the rate of spring melt. Although snowmobiling would be permitted after March 31 in some areas, spring snowmobiling areas and spring grizzly bear habitat are almost mutually exclusive in that the areas that would be suitable for spring snowmobiling (i.e. more snowpack) would not typically overlap with spring grizzly bear habitats (i.e. less snowpack). Therefore, the Service does not expect impacts to spring habitat and foraging grizzly bears related to winter motorized use to be significant.

Non-motorized recreation

Recreation settings are categorized into six Recreation Opportunity Spectrum (ROS) classes ranging from ‘primitive’ (e.g., designated wilderness, recommended wilderness areas, and others) to ‘rural’ (e.g., areas immediately adjacent to small communities or private land inholdings, and others), to ‘urban’. ROS categories provide some indication of the overall amount of area in which general types of recreation are allowed. Table 13 in the supplement to the biological assessment displays the acreage of ROS categories by GA under the 2021 Forest Plan, with the exception of urban with the exception of urban as no areas on the Forest meet the definition of urban (U.S. Forest Service 2020, U.S. Forest Service 2021).

The 2021 Forest Plan designates two recreation areas: the South Hills Recreation Area (within NCDE zone 2) and the Grandview Recreation Area (outside of area where grizzly bears may be present). Both areas include desired conditions to offer dispersed, non-motorized recreation opportunities. In the South Hills Recreation Area, mountain bike use would only be suitable on established roads and trails. The 2021 Forest Plan also identifies 64,983 acres of recommended wilderness within the area where grizzly bears may be present, increasing the amount of recommended wilderness by about 30,805 acres within this area. Other recommended wilderness areas are identified but are located outside of where grizzly bears may be present. Recommended wilderness areas are to be managed to retain characteristics that would allow them to become designated wilderness in the future, should Congress decide to do so. Tables 3 and 12 in the supplement to the biological assessment displays the previously recommended wilderness and the recommended wilderness under the 2021 Forest Plan (U.S. Forest Service 2021).

Non-motorized activities such as mountain biking, horseback riding, and hiking will occur throughout the action area. The potential for these non-motorized activities to result in disturbance effects does exist. In most situations, such impacts would likely be short-term and would range from no response from a grizzly bear to a grizzly bear temporary fleeing the area. Grizzly bears may adapt to consistent, predictable activity and may notice the activity but not flee from it (Jope 1985, Mattson 2019). This reaction is more likely to occur on trails with regular use. 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 2019). Due to varying skill levels and speed of travel of mountain bikers, they 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 2019, Herrero and Herrero 2000 *in* Servheen et al. 2017). Sudden surprise encounters can also result in human-grizzly bear conflicts, depending on whether the bear flees or charges. Often, grizzly bears disturbed by non-motorized use will exhibit increased nocturnal activity and decreased daytime activity when non-motorized use is most likely to occur (Mattson 2019). While grizzly bears may experience varying degrees of disturbance effects as a result of non-motorized recreation, due to the amount of human use and the type of activities on the Forest along with the lack of conflicts related to such, we expect effects will be insignificant as grizzly bears will likely adapt to such use or change its use patterns. Grizzly bears are habitat generalists and would be able to shift their use to low disturbance areas within their home ranges during activity. Such impacts are not likely to significantly affect an individual grizzly bear's ability to breed or find food or shelter.

Food and Attractant Storage and Site Development

This section focuses on analysis and discussion of the direct and indirect effects to grizzly bears related to food and attractant storage issues and site development. Also refer to the '*Habituation to Human Attractants*' subsection in the '*General Effects of Roads on Grizzly Bears'* section for further discussion on habituation.

General Effects of Food and Attractant Storage and Habituation

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.

Incidence of property damage or conflicts associated with human-related foods is inversely proportional to the availability of high quality grizzly bear foods found in the wild; during periods of poor natural food production incidences of human-grizzly bear conflicts typically increase. When poor seasonal bear foods exist in part of or through the entire non-denning season in the GYE and NCDE, the incidences of bears causing property damage and obtaining anthropogenic foods increased significantly over average or good years (Gunther et al. 2004, Manley 2005). The conflict relationship is magnified when the availability of late season natural foods such as whitebark pine seeds is insufficient to meet the high energy requirements during hyperphagia (Mattson et al. 1992).

Numerous studies in the NCDE elucidate the importance of late-season frugivory by grizzly bears, especially globe huckleberries (*Vaccinium globulare*; Martinka and Kendall 1986, Weaver et al. 1990). Berry failure due to drought or destruction of plants by fire would force grizzly bears to range more widely than in normal periods of seasonal availability (Blanchard and Knight 1991). Therefore, grizzly bears face an increased risk of encounters with humans and ultimately human-caused mortality during the autumn season. Grizzly bears in some areas that avoided trails with human activity during part of the year changed this avoidance behavior when a favored berry resource came into season (Donelon 2004). Although grizzly bears still had a low tolerance for trails with high human activity, the tendency to approach areas of human activity when nutritional and energy needs are high could put individual bears at an increased risk of immediate conflict or condition them to the presence of people, which could lead to conflicts later in time.

Effects of Habituation and Developed Sites in the Action Area

Developed recreation sites are sites or facilities with features that are intended to accommodate public use and recreation, such as campgrounds, trailheads, rental or permit cabins, lodges, ski areas, fire lookouts, and others. Developed sites on public lands are associated with frequent and/or prolonged human use that may include continuous or frequent presence of food and attractants. The Forest has a total of 215 developed recreation sites (not including permit cabins and lodges) spread across the action area, including but not limited to boating access points, interpretive pullouts, campgrounds, and trailheads. Of these, a total of 21 developed recreation sites that allow public overnight use (rental cabins, campgrounds), 99 permitted recreation residence cabins, and 4 permitted commercial lodges occur on the Forest within the recovery zone. The 2021 Forest Plan include limits within the recovery zone on the number and capacity of developed sites that are available to the public for overnight use (PCA-NDCE-STD-06). Dispersed recreational opportunities will also occur throughout the 2021 Forest Plan action area.

Habituated grizzly bears learn to seek out developed and dispersed sites for food rewards. Habituation and food conditioning of grizzly bears is a concern. The 2021 Forest Plan has several measures to continue to manage food and attractants. These are described in the biological assessment and include: FW-NCDE-STD-02, PCAZ1Z2-NCDE-STD-01, PCAZ1Z2-NCDE-STD-02, PCAZ1-NCDE-STD-01, PCAZ1-NCDE-STD-02, PCAZ1-NCDE-STD-08, and PCAZ1-NCDE-GDL-01 (U.S. Forest Service 2020). A Forest-wide guideline relevant to food and attractant storage in all portions of the action area (FW-WL-GDL-02) is also part of the 2021 Forest Plan. These 2021 Forest Plan components not only implement food and attractant storage requirements, but also additional measures to ensure that permittees using Forest lands adhere to those orders and in some circumstances take additional steps to minimize the risk of grizzly bear-human conflicts. In addition, to these standards and guidelines, three Food Storage Special Orders are in place across the Forest and are expected to continue to be in place during the life of the 2021 Forest Plan. All users throughout the action area are required to adhere to the food storage orders and guidelines.

Since implementation of the first food storage order on the Forest, only one known instance of a management removal or death of a grizzly bear due to improperly stored attractants has occurred on the Forest. A grizzly bear on the Rocky Mountain ranger district got into improperly/illegally stored horse feed at a hunting camp in late 1999, and subsequently caused damage to several hunting camps and Forest tack sheds in the area. Attempts to trap the bear that year were unsuccessful. The same bear broke into the Green Fork administrative cabin in the Scapegoat Wilderness the following year (fall 2000) and was trapped and euthanized.

With proper food and attractant storage under the 2021 Forest Plan, the potential of attracting grizzly bears would be reduced and the potential for grizzly bear-human conflicts would be minimized. Based on the previous history of only 1 grizzly bear removal over 20 years ago related to food or other attractants, along with measures taken to continue to manage food and attractants and to minimize the potential for grizzly bear-human conflicts (i.e food storage special orders Forest-wide), the effects of habituation and resulting grizzly bear-human conflicts are expected to be discountable.

Livestock Grazing

General Effects of Livestock Grazing

Effects of livestock grazing on grizzly bears are generally related to depredations of livestock by grizzly bears, disposal of livestock carcasses, storage of human food and stock feed, and grizzly bear habituation, food conditioning, and mortality risk associated with these activities. Depredating bears may become food conditioned resulting in management actions that remove bears from the population. Although grizzly bear conflicts with cattle do exist, the more significant problems have been with sheep (Orme and Williams 1986). The adverse effects of domestic sheep grazing on grizzly bears are well documented (Knight and Judd 1983, Johnson and Griffel 1982). Sheep grazing in occupied grizzly bear habitat poses substantive risks to grizzly bears since bears kill sheep much more readily than other livestock and because sheep are often closely tended by herders typically armed and protective of their flock. In one study in the Yellowstone grizzly bear ecosystem, of 24 grizzly bears known to use livestock allotments, 10 were known to kill livestock (Knight and Judd 1983). Of these bears, 7 killed sheep, 5 of which were trapped and fitted with radio transmitters. All but one radio collared grizzly bear cub that

had the opportunity to kill sheep did so. Grizzly bears that kill livestock include a range of ages and both sexes (Johnson and Griffel 1982).

Being an opportunistic feeder, any individual grizzly bear can learn to exploit livestock as an available food source just as easily as they habituate to other human food sources (Johnson and Griffel 1982). Knight and Judd (1983) reported several differences between cattle and sheep conflicts with grizzly bears. They found that all radio-collared grizzly bears known to have come in close contact with sheep killed sheep, but most grizzly bears that encountered cattle did not make kills. They also found that all known cattle kills were carried out by adult bears 7 years or older, while both adults and subadults from 1 year to 13 years old killed sheep. Grizzly bears that killed sheep, usually took multiple sheep over several days. However in each instance when the sheep were moved out of the area the predation ended (Johnson and Griffel 1982). Livestock carcasses may also attract grizzly bears. Grizzly bears have a strong tendency to return to a carcass for two or more feedings (Johnson and Griffel 1982). Therefore, proper treatment or disposal of livestock carcasses would greatly reduce the potential attractants for grizzly bears.

Effects of Livestock Grazing in the Action Area

The Forest has 240 active grazing allotments. Of these, 5 are active sheep allotments with 3 in the Upper Blackfoot GA (within both the recovery zone and NCDE zone 1) and 2 in the Big Belts (within NCDE zone 2). Table 3 displays these allotments by GA. The 2021 Forest Plan would not change the number and location of livestock allotments nor the number and type of animals allowed to graze on these allotments. As previously explained, the specific numbers of animals grazing on any given allotment, along with timing and duration of use, are established annually in Annual Operation Plans and vary from year to year. The location, size, or management of grazing allotments would not be affected by the 2021 Forest Plan and any changes would be addressed through site or area specific range analyses.

The 2021 Forest Plan provides management direction that would be used when annual operating plans are developed, when grazing permits are issued or re-issued, and when allotment management plans are revised or developed. The following are 2021 Forest Plan components related to livestock grazing management and are described fully in the biological assessment (U.S. Forest Service 2020): PCAZ1-NCDE-STD-01, PCAZ1-NCDE-STD-02, PCAZ1-NCDE-STD-03, PCAZ1-NCDE-STD-04, PCA-NCDE-STD-10, PCA-NCDE-STD-11, and PCA-NCDE-GDL-09. In summary, these standards and guideline incorporate requirements into new or reauthorized grazing permits that reduce the risk of grizzly bear-human conflict and require reporting of livestock carcasses within 24 hours of discovery within the recovery zone and NCDE zone 1, prohibit increases in the number of sheep allotments or permitted animal unit months above the baseline within the recovery zone and NCDE zone 1, reduce the number of sheep allotments when opportunities arise in the recovery zone, limit potential conflict associated with weed control via small livestock within the recovery zone and NCDE zone 1, and prohibit increases in the number of active cattle grazing allotments in the recovery zone. These standards and guideline do not apply to the portions of the action area within NCDE zones 2 and 3.

No documented grizzly bear mortalities associated with livestock have occurred within the action area. Based on the information for livestock grazing in the action area (the small number of sheep allotments, the standards within the recovery zone and NCDE zone 1, and the history of no grizzly bear mortalities associated with livestock), the likelihood of adverse impacts to grizzly

bears related to livestock grazing in the action area during the life of the 2021 Forest Plan is low, but cannot be ruled out. Due to the long duration of the 2021 Forest Plan, the number of grizzly bears using the action area is expected to increase and livestock grazing will remain a potential risk.

In summary, livestock management in the action area, especially if sheep allotments are added in NCDE zones 2 and/or 3, has 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.

Vegetation and Fire Management

General Effects of Vegetation and Fire Management

Vegetation management and fire management, including activities such as commercial or noncommercial harvest, fire suppression, and fuels treatments (prescribed fire, mechanical treatment, and/or chemical treatment) may impact grizzly bears as a result of the potential for short-term disturbance. Such disturbance involves the presence of humans and often includes the use of motorized equipment. Harvest units are often located in close proximity to existing roads, thus many units may already be avoided by grizzly bears. Also, untreated habitat typically remains widely distributed within project area as well as an action area and would accommodate grizzly bear use during activity.

We expect that grizzly bears would likely leave an area on their own accord in advance of an approaching fire and therefore be out of the area associated with fire suppression activities. However, if suppression activities were to take place prior to an approaching fire, grizzly bears may still be in the vicinity. Some effects from disturbance may be caused by the overall increase in human activity in a particular area. These activities may include increased vehicular traffic, aerial support and fire camps, any of which may affect a grizzly bear prior to their leaving the area. The possibility of a direct encounter with a grizzly bear by a person or group of people involved in fire management activities is remote. Disturbance effects to grizzly bears as a result of vegetation or fire management would likely be short-term and insignificant.

Longer-term effects related to vegetation management include impacts to grizzly bear cover and forage. A decrease in the amount of cover may result in different effects to grizzly bears and their habitat. If cover is limiting in the project area, either by the amount or distribution, vegetation management may result in negative impacts (Ruediger and Mealy 1978). Reduced cover may increase the visibility of grizzly bears, which may potentially increase their vulnerability to illegal human-caused mortality and/or contribute to movement from preferred habitats. However, if cover is not limited in an action area, timber harvesting may have either no effect or a positive effect in those situations where food abundance or distribution is improved. By removing or reducing overstory vegetation through harvesting, slashing, and/or burning, sunlight reaches the forest floor or clearing and grizzly bear food production may be increased (Ruediger and Mealey 1978). This includes foods such as berries and succulent forbs.

In a study on use of harvested stands, Waller (1992) found that use of these stands increased during the berry season, due to some harvested stands having high berry production. If food production or distribution is improved but human activity is not controlled after the completion

of harvest activities, negative impacts on grizzly bears may occur due to an increase in the potential for conflicts between humans and grizzly bears (Ruediger and Mealey 1978). Waller (1992) found that of the harvested stands that he studied, those with the highest grizzly bear use had limited access for people due to closed gates and/or over-grown roads. Grizzly bears within his study area that used harvested stands were found at higher elevations and spent little time in lower elevation stands where harvest was most common. Waller attributed this to human use of those lower, more accessible harvested stands. Waller also found that grizzly bears avoided stands where the vegetation had not recovered enough to provide security cover and preferred to use stands that were 30 to 40 years post-harvest.

Zager (1980) found that differences of shrub responses depended on the type of treatment that occurred post-harvest. Among the key shrub grizzly bear foods on clearcut sites where slash was bulldozer-piled before burning, Zager found a consistent decline in canopy coverage when compared to old burns. This is likely due to the extreme heat created by burning slash piles which may kill rhizomes and root crowns and bulldozer use which may also destroy rhizomes and root crowns. In those areas where slash was either broadcast burned or not treated, key grizzly bear shrub foods were generally found throughout the sites, except on skid roads and other severely disturbed areas. On relatively mesic sites, globe huckleberry, mountain-ash and serviceberry generally increased in cover.

The use of wildland fire for resource benefit is typically allowed only where there is some degree of certainty that the fire would go out naturally or could be contained within predefined lines. These types of fires can result in short-term negative effects and/or long-term beneficial effects depending on the vegetation species and fire severity. Some foraging habitat and/or cover may be affected in the short-term. However, natural fire often stimulates the understory and/or increases the vegetative diversity (forbs, grasses, berry-producing shrubs) in high quality grizzly bear habitat, benefitting grizzly bears in the long-term.

Vegetation management activities that would occur during the grizzly bear denning season are not likely to impact grizzly bears. Snow is an excellent sound barrier (Blix and Lentfer 1992) and impacts to denning bears 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).

Often, temporary roads are constructed and/or restricted roads are used in relation to vegetation and fire management activities. Effects from fire suppression activities may result from constructing firebreaks and/or machine lines. These actions may temporarily contribute to the effects related to motorized access or may result in effects to grizzly bears similar to effect of roads on grizzly bears. The impacts of roads are discussed above in the '*General Effects of Roads on Grizzly Bears*' and the '*Effects of Motorized Access in the Action Area*' sections above. In addition, food and garbage storage at activity sites and camps may attract grizzly bears and contribute to risks. Such effects are also discussed above (see the '*Effects of Food and Attractant Storage and Habituation*' section above).

Helicopters may also be used in vegetation and fire management activities, and in general reduce impacts to grizzly bears where they reduce or eliminate the need for new roads. Helicopter use may elicit a response in grizzly bears. Effects may range from a simple awareness of the helicopter, short-term disturbance or flight response, or displacement from an area

(Montana/Northern Idaho Level 1 Terrestrial Biologist Team 2009). In timbered habitats, McLellan and Shackleton (1989) found that an overt avoidance or displacement response occurred with high intensity helicopter activity, such as carrying equipment within 200 meters of a grizzly bear. Helicopter use that is short in duration and low in frequency, would not likely result in significant affects to grizzly bears. Extended helicopter use with multiple passes could interfere with the normal behavior patterns of grizzly bears. However, when considering long-term habitat effects, helicopter use does not use or require roads and may not pose the same chronic displacement effects or mortality risks that roads-based operations do. Helicopter use is a temporary event, whereas roads can be features on the landscape long after a project is complete. Consequently, while short-term helicopter activities may impact grizzly bears, they do not impart the same chronic habitat effects as roads. If repeated, low altitude flights continue into multiple seasons, the effects upon grizzly bear behavior (i.e., avoidance and more than just temporary disturbance) may become more substantial.

The effects to grizzly bears of repeated, low altitude flight paths that follow open roads may be partially offset by the existing under-use of habitat in the immediate vicinity of the roads due to the "avoidance" by grizzly bears of habitat in close proximity to open roads. In many cases, the effects of helicopter logging that occurs in roaded habitat would have insignificant effects to grizzly bears. However, helicopter logging in areas that are not highly roaded could result in adverse effects to grizzly bears adapted to the use of more secure habitat. Thus, the effects of helicopter use on grizzly bears can vary significantly; effects will be determined through an analysis of site-specific activities and conditions in the area.

Effects of Vegetation and Fire Management in the Action Area

The 2021 Forest Plan established active vegetation management as an appropriate tool with which to achieve desired vegetation and habitat conditions in the action area. Vegetation treatment, including prescribed fire, is encouraged to improve habitat for various wildlife species and groups. Harvesting within the action area will be used 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.

The 2021 Forest Plan components related to vegetation and fire management are described fully in the biological assessment (U.S. Forest Service 2020). These plan components would sustain healthy, resilient plant communities on which grizzly bears depend for food and cover and would reduce the risk of disturbance to bears during or as a result of vegetation management activities, and to maintain or increase habitat and cover where possible. Vegetation management must also adhere to other grizzly bear related guidance, including standards regarding motorized route density and food storage orders.

Currently, approximately 414,936 acres (14 percent of the action area) of the Forest is considered suitable for timber production (the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use). Under the 2021 Forest Plan, approximately 368,563 acres (13 percent of the action area) would be suitable for timber production, a slight reduction from the existing condition.

Areas that are not suitable for timber production include such things as Recommended Wilderness Areas, eligible wild and scenic river corridors, riparian management zones, certain cultural and historical sites, and some others. Under the 2021 Forest Plan, Recommended Wilderness Areas have increased over the existing condition. In addition, lands with marginal timber growth potential based on landscape or vegetation characteristics, areas with limited access (including, for example, most areas identified with 'Primitive' or 'Semi-primitive non-motorized' Recreation Opportunity Setting categories), or areas with certain other management emphasis are not included in the lands suitable for timber production.

Harvest for other multiple use values and purposes could occur on approximately 1,674,482 acres (58 percent of the action area) that are not suitable for timber production. This is a slight increase from the existing conditions where harvest could occur approximately 1,167,247 acres (40 percent of the action area) that are not suitable for timber production. Inventoried Roadless Areas make up a majority of lands that are unsuitable for timber production but where some harvest may occur. The acreage available for harvest but unsuitable for timber production in areas outside of the Inventoried Roadless Areas is approximately 561,696 acres (19 percent of the action area) compared to 521,619 (18 percent) under the existing condition.

Timber harvest models run predictions based on decades rather than estimating the amount during the life of the plan. Under the 2021 Forest Plan, it is estimated that 2,279 acres of harvest would occur per year over the first 10 years after plan implementation. It is also estimated that 2,709 acres of harvest would occur per year during the second decade after plan implementation. More than half of these harvest acres are predicted to occur on lands identified as suitable for timber production. These acres also include projects proposed for fuels reduction. The Forest estimates that approximately 3,165 acres of prescribed burning will occur per year in the first decade after implementation and up to 3,565 acres per year in the second decade.

The Forest has provided model estimates of the total likely acreage that might be affected by wildfire per decade. The modelling estimates that approximately 195,000 acres may be affected by wildfire over the next decade under the 2021 Forest Plan or under continuation of existing management. It is important to note that this is just an estimate and the actual acres affected by wildfire will be highly variable and not influenced to any real extent by forest management under the 2021 Forest Plan. Since decisions regarding management of wildfires are made using site-specific information as individual fires occur, a prediction on the number of acres of wildfire that may be managed for resource benefit was not made. Decisions on whether to manage a wildfire for resource benefit will include an analysis of the site-specific information such as location of a wildfire start, natural and human resources and values at risk, timing of fire occurrence, current and predicted weather, local and national resource availability, and other factors. Thus, it will be determined at the time of a wildfire event whether the appropriate action will be suppression or to manage the wildfire for resource benefit, or a combination of these options.

Future proposed vegetation management actions are expected to provide sufficient habitat for grizzly bears, such as cover, forage, and denning among others. We expect that forest, grassland, shrubland, and riparian habitats would be managed to provide early, mid, and late successional vegetation stages. Every proposed vegetation and/or fire management project within the action area would consider potential effects to grizzly bears during the site-specific project analysis

process. Site specific project analysis will determine the type and extent of vegetation treatments and the potential effects to grizzly bears.

Based on our history of consultation on vegetation and fire management projects, information in our files, and the analysis under the '*General Effects of Vegetation Management*' section above, we do not anticipate that vegetation management activities by themselves would result in effects to grizzly bears that would be so significant as to impact breeding, feeding or sheltering. Grizzly bears are habitat generalists and would be able to shift their use to low disturbance areas within their home ranges during treatment activity. Thus, disturbance effects are expected to be minimal. The potential effects on cover, forage, and denning habitat from vegetation management actions proposed under the 2021 Forest Plan would likely be minor and insignificant and potentially beneficial. While proposed activities would likely open up patches of forested habitat and travel may be altered somewhat, areas of untreated forest typically remain and treatments are not expected to create barriers to movement or preclude travel. Linkage and habitat connectivity are not likely to be significantly affected. With proper food and attractant storage, the potential of attracting grizzly bears into the treatment units would be reduced and the potential for conflicts between grizzly bears and personnel associated with the action would be minimized. With such measures taken to minimize the potential for grizzly bear-human conflicts, the effects of such conflicts are expected to be discountable. Again, site-specific project analyses will occur to determine the potential effects of any proposed action. The effects on grizzly bears associated with fire suppression and/or wildfire for resource benefit would be analyzed after the suppression activities and/or wildland fire are complete, with emergency consultation occurring where appropriate.

Activities that occur along with vegetation management activities such as temporary road construction, restricted road use, or helicopter use may result in additional effects to grizzly bears. Such effects could range from insignificant to significant depending on site-specific information. The effects of temporary roads are discussed in the '*Effects of Motorized Access in the Action Area*' sections above. General effects of helicopter use are discussed above in the '*General Effects of Vegetation Management*' section. Potential effects that may occur as a result of temporary road use, restricted road use, and/or helicopter use associated with vegetation management would be considered in a site-specific analysis.

In summary, with the exception of effects related access management or helicopter use, which may be adverse at times, we do not anticipate adverse effects to grizzly bears as a result of vegetation and/or fire management within the action area. Related motorized access and helicopter use may or may not result in adverse effects to grizzly bears and any effects would be considered in a site-specific analysis.

Energy and Mineral Development

Effects of Energy and Mineral development in the Action Area

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 Elkhorns Wildlife Management Unit within the Elkhorns GA is also administratively withdrawn from oil and gas leasing, but could be available for other types of leasable minerals exploration and development. By act of congress, the entire Rocky Mountain Range GA is withdrawn from future locatable or leasable minerals exploration or development. The 2021 Forest Plan would not alter the acreage available for minerals and energy exploration or development described in the environmental baseline but would provide direction for managing any minerals and energy exploration and development that might occur.

PCA-NCDE-STD-12 requires no surface occupancy for any new leases for new leasable minerals within the recovery zone. PCAZ1-NCDE-STD-06, 07, 08, 09, 10, and 11 retain measures in existing permits and operating plans and add measures in new or reauthorized permits and operating plans to reduce or mitigate potential impacts to bears in the recovery zone and NCDE zone 1. Other guidelines and standards related to the management of energy and mineral development and grizzly bears are described in the biological assessment (U.S. Forest Service 2020).

The 2021 Forest Plan recognizes energy and minerals exploration and development as appropriate uses of Forest lands. Activities associated with these uses have the potential to impact individual grizzly bears. Many of the impacts are associated with motorized access and are discussed above in the '*General Effects of Roads on Grizzly Bears*' and the '*Effects of Motorized Access in the Action Area*' sections above. In addition, food and garbage storage at activity sites and camps may attract grizzly bears and contribute to risks. Such effects are also discussed above (see the '*Effects of Food and Attractant Storage and Habituation*' section above). Finally, general effects associated with helicopters are discussed above in the '*General Effects of Vegetation and Fire Management*' section above.

Given the small footprint and overall low level of mineral and energy development activity in the action area and the application of design features and measures intended to prevent or minimize effects to grizzly bears, any grizzly bears that occur in the vicinity of activity related to mineral and energy development activities would likely have options to move to more undisturbed, available habitat. If grizzly bears are using the area in the vicinity of a proposed activity related to mineral development, we would expect some level of short-term disturbance from areas of activity. With the exception of potential adverse effects associated with motorized access or helicopter use, the remaining effects associated with energy and/or mineral development are not likely to be adverse to grizzly bears and grizzly bear habitat conditions. Any additional effects not specifically addressed here would be addressed in a site-specific consultation if the site-specific action 'may affect' grizzly bears.

Effects Summary

In reviewing the effects of the 2021 Forest Plan on grizzly bears across the action area, the overwhelming majority of Forest management actions that may have the potential to adversely impact grizzly bears include motorized access and, to a lesser extent, livestock grazing. We do not anticipate adverse effects as a result of non-motorized recreation, food and attractant storage and site development, vegetation and fire management, or energy and mineral development, except for the effects that may be associated with access management, including potential

helicopter use, which may be adverse at times depending on the site specific information. Effects related to access management and livestock grazing will vary depending on site-specific information. Not all actions related to motorized access and livestock grazing that may be proposed under the 2021 Forest Plan will result in adverse effects.

As anticipated in the Recovery Plan, grizzly bears are expanding their range outside of the recovery zones. Grizzly bears outside of recovery zone probably experience a higher level of adverse impacts due to land management actions than grizzly bears inside the recovery zone. However, grizzly bears are able to live in habitat in the action area outside of the recovery zone. As grizzly bear numbers increase in the action area and expand their range, it is possible that the Forest will experience an increase in conflicts involving grizzly bears and human use. Nevertheless, we conclude that the 2021 Forest Plan contains measures that minimize the potential for adverse impacts to grizzly bears from Forest management activities within the action area.

Portions of the action area have high levels of motorized routes while other portions have low levels of motorized routes or no motorized routes at all. Current open route densities (and associated levels of secure core and secure habitat) within the recovery zone and NCDE zone 1 would be maintained under the 2021 Forest Plan. With a few exceptions, Forest lands within the recovery zone would be managed for no net increase above the 2011 baseline motorized access conditions. Secure habitat within the remainder of the Forest could change under the 2021 Forest Plan, potentially decreasing the amount of security habitat. However, as described above, the likelihood of such is low. If such changes were to occur within the action area, the effects related to displacement of grizzly bears may also increase. No specific increases are proposed under the 2021 Forest Plan and would be proposed on a site-specific basis with a site-specific analysis occurring.

Temporary road construction and use and temporary use of restricted roads may also occur on a project by project basis. Temporary roads may be short-term in duration of use or may remain on the landscape for several years and receive a substantive amount of use.

Within the recovery zone, PCA-NCDE-STD-04 allows projects to temporarily increase OMARD by 5 percent, temporarily increase TMARD by 3 percent, and temporarily decrease secure core by 2 percent. PCA-NCDE-STD-02 requires that administrative use on roads with public restrictions does not exceed either 6 trips (3 round trips) per week or 1 thirty-day unlimited use period during the non-denning season. Temporary project implementation within the recovery zone is not expected to exceed 5 years (PCA-NCDE-GDL-01). Further, under guideline PCA-NCDE-GDL-02, pre-project conditions (i.e., OMRD, TMRD, secure core) would generally be restored within 1 year of project completion. As previously mentioned, while the 2012 planning rule allows the Forest to deviate from guidelines so long as they meet the purpose of the guidelines, it is not known at this time what other scenarios may be used to meet the purpose of these guidelines. Thus, these guidelines, as written, will be used as part of our effects analysis. If the purpose of the guidelines are met in a different way, site-specific consultation may be necessary depending on the site-specific information and effects.

Outside of the recovery zone, the Forest estimated that secure habitat may be temporarily impacted by the construction of temporary project roads or temporary use of restricted roads by an average of 2.5 percent and no more than 7 percent at any given time in any individual GBAU

over the life of the 2021 Forest Plan. The temporary changes in the effectiveness of secure habitat, which may occur during implementation of vegetation management projects, would not likely occur in more than six GBAUs in total during that time and likely in no more than two adjacent GBAUs concurrently.

We do not expect all temporary (new or use of restricted roads) roads to have adverse impacts on female grizzly bears, or that all female grizzly bears would be adversely affected by these roads. However, if under-use of key feeding and sheltering habitat by female grizzly bears is significant, they may fail to obtain the necessary resources to breed and successfully reproduce. The level of effects would depend on such things as grizzly bear use in the action area, location of the road, length of the road, the frequency and intensity of use, and the duration the road would be on the landscape, in relation to those factors listed above for effects of roads.

The effects of displacement and under-use of habitat related to the existing motorized access conditions and potential temporary road construction and use are tempered by local resource availability, resource condition, seasonal use, and the number of grizzly bears using an area. Currently, the number of grizzly bears using the action area varies from higher numbers within the recovery zone and NCDE zone 1 to lower numbers in the remaining portions of the action area. For many areas, grizzly bears numbers are very low and are expected to increase slowly over time. This is particularly true for female grizzly bears and presence of female grizzly bears within NCDE zone 2 and especially NCDE zone 3 of the action area is likely to increase slowly. For the GBAUs lacking female grizzly bear use, until such time that female grizzly bears begin to use these GBAUs, the existing motorized access conditions, temporary roads, and temporary use of restricted roads are not likely resulting in adverse effects to grizzly bears.

As such, while adverse effects from low amounts of secure habitat and high route densities in some portions of the action area may result in the displacement of individual grizzly bears, the avoidance of suitable habitat, and/or the reduction of habitat to an unsuitable condition, we anticipate that the adverse effects would affect only few adult females over the life of the 2021 Forest Plan. We conservatively include the potential for adverse effects in areas lacking female grizzly bear use due to the long time-frame that the 2021 Forest Plan will be effective, during which some females may begin to use these GBAUs and experience adverse effects from the ongoing motorized access conditions and low amounts of secure habitat and/or temporary roads or temporary use of restricted roads.

We do not expect that all adult females exposed to motorized routes would suffer significant effects, nor would the effects persist throughout an individual female's life span. We expect that effects would vary substantially depending upon the wariness of the individual bear, the size of and habitat quality within her home range, the number of other grizzly bears using the particular area, climate conditions, annual food resources, and the nature, intensity and duration of human activity during any particular year. All of these are factors that may affect options available to adult females if displaced. Additionally, conditions the following year may be considerably different. Thus, not all female grizzly bears that may use the action area during the life of the 2021 Forest Plan will experience significant effects related to motorized access management. If or when female grizzly bears begin to use the portions of the action area with very low grizzly bear use currently, specific areas with higher motorized route densities may lead to the under-use of suitable habitat by grizzly bears and may significantly impact some grizzly bears' ability to find food resources, breed and raise young, and find shelter. However, grizzly bears moving into

these portions of the action area may be able to tolerate the existing levels of motorized route densities or may be able to entirely avoid areas with roads in some GBAUs due to less competition from other grizzly bears.

The Service anticipates that winter motorized use (snowmobile or over-the-snow) that may occur under the 2021 Forest Plan may incidentally result in some very low level of adverse effects to grizzly bears. Snowmobiling would be restricted on large proportions of denning and spring habitat on the Forest and thousands of acres of denning and spring habitat would be legally unavailable to snowmobiles in the broader area where grizzly bears may occur. Where grizzly bears and snowmobiling do generally overlap, there is still some spatial separation. However, the potential of snowmobile use adversely impacting an individual grizzly bear cannot be eliminated.

The best information available indicates that snowmobile impacts to grizzly bears emerging from dens was a higher concern than impacts to denning bears (Graves and Ream 2001). The Service concludes that snowmobile-generated disturbance to grizzly bears in dens during the deep of winter is not likely to rise to the level causing significant impairment of breeding or sheltering to the point of injury or death. In spring, disturbance from snowmobiles to grizzly bears in dens may cause premature den emergence. Based on naturally earlier den emergence of male bears and females without young, their independence and mobility, the Service does not anticipate the effects of disturbance caused by snowmobiles would be adverse to male grizzly bears or female grizzly bears without cubs.

However, late season snowmobile use may cause a female grizzly bear with cubs to prematurely leave a den in the spring or cause a recently emerged female with cubs to be prematurely displaced from her den or den site, potentially resulting in decreased fitness of the adult female bear and/or decreased fitness or abandonment of her cubs. If cubs attempt to follow their mother from a den site prior to their gaining some mobility, they may suffer from decreased fitness or death.

Snowmobile use within the recovery zone portion of the action area is prohibited after March 31 with the exception of the Copper Bowls play area where snowmobile use is authorized until May 31. Within the Copper Boles extended use area, approximately 691 acres overlap with modeled denning habitat. Within the portion of the action area outside of the recovery zone, the timeframe for winter motorized use varies. Portions of Dalton Mountain and Humbug GBAUs, in areas south of Highway 200, areas are open to snowmobiling through April 15; roughly 7,600 acres overlap modeled denning habitat. For the GBAUs across the remaining portions of the Forest, the dates during which over-snow motorized travel is authorized vary from yearlong to ending on May 15; for those areas where winter motorized use that extends beyond March 31 approximately 112,535 acres overlap with modeled denning habitat. Many of these same acres are relatively dry and snow can be intermittently present. Thus, not all areas legally open to over-snow motorized travel are actually available during the entire time they are open.

Thus, in total, approximately 120,826 acres of modeled denning habitat overlap late season snowmobiling beyond March 31. The late-season snowmobile closure dates are May 31 for the Copper Bowls extended use area within the recovery zone and April 15 to May 15 for the portion of the action area outside of the recovery zone.

Conflicts arising from livestock grazing are recognized as a source of human-caused mortality of grizzly bears. The 2021 Forest Plan provides management direction that would incorporate requirements into new or reauthorized grazing permits that reduce the risk of grizzly bear-human conflict and require reporting of livestock carcasses within 24 hours of discovery within the recovery zone and NCDE zone 1, prohibit increases in the number of sheep allotments or permitted animal unit months above the baseline within the recovery zone and NCDE zone 1, reduce the number of sheep allotments when opportunities arise in the recovery zone, limit potential conflict associated with weed control via small livestock within the recovery zone and NCDE zone 1, and prohibit increases in the number of active cattle grazing allotments in the recovery zone. These standards and guideline do not apply to the portions of the action area within NCDE zones 2 and 3.

Livestock management in the action area, especially if sheep allotments are added in NCDE zones 2 and/or 3, has 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. No documented grizzly bear mortalities associated with livestock have occurred within the action area. Based on the information for livestock grazing in the action area (the small number of sheep allotments, the standards within the recovery zone and NCDE zone 1, and the history of no grizzly bear mortalities associated with livestock), the likelihood of adverse impacts to grizzly bears related to livestock grazing in the action area during the life of the 2021 Forest Plan is very low, but cannot be ruled out entirely. Due to the long duration of the 2021 Forest Plan, the number of grizzly bears using the action area is expected to increase and livestock grazing will remain a potential risk. Therefore, it is reasonable to expect that some risk, albeit low, of adverse impacts to grizzly bears related to livestock grazing exists over the life of the 2021 Forest Plan. Any new permits or changes to existing permits would proceed through a site-specific section 7 consultation, as appropriate.

Although the Forest's management of grizzly bear habitat may result in direct and indirect adverse effects on individual grizzly bears, we do not anticipate that these effects will have appreciable negative impacts on the grizzly bear populations. 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 NCDE 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.

Even though much of the action area is outside of the recovery zone, the Forest has managed and will continue to manage the lands in such a way that has allowed grizzly bears to expand. Thus, although individual grizzly bears may be adversely affected at times over the life of the 2021 Forest Plan, we anticipate that grizzly bear use will continue to increase within the action area into the future.

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 revised 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 resulting in a reduction of 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 an increase of 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 in the ecosystem is increasing as well (U.S. Fish and Wildlife Service 2020, Costello et al. 2016). 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 2021 Forest 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 use of the Forest via motorized access in areas unauthorized for such use may occur within the action area, such illegal use is not considered a Forest (federal) action. These, and any other illegal activities are not the result of a federal action and therefore not analyzed under effects of the action, but their influence is considered for potential cumulative effects. Also described above, while cumulative effects to

grizzly bears may occur as a result of illegal motorized access, the information as to the length, duration, amount of use, type of use, and location, among other conditions, is and will continue to be unknown until such time that illegal use is found. 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.

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 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 2021 Forest 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 and the Forest.

The 2021 Forest Plan may occasionally result in adverse effects to individual female grizzly bears over the life or the plan, particularly as a consequence of the potential disturbance and/or displacement related to access management. The likelihood of adverse impacts to individual grizzly bears related to livestock grazing in the action area during the life of the 2021 Forest 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 NCDE grizzly bear population. Further, we expect the 2021 Forest Plan direction will result in conditions that support continued grizzly bear use of the action area, especially in the recovery zone and NCDE zone 1 as well as use of NCDE zones 2 and 3 for dispersal or exploratory movements, and potentially some home range establishment at some point in the future, albeit at densities lower than those in the recovery zone. Thus, it is our opinion that the 2021 Forest Plan would not appreciably reduce the likelihood of both the survival and recovery of grizzly bears. Below we summarize key factors of our rationale for our no-jeopardy conclusion as detailed and analyzed in this revised biological opinion. These key factors include, but are not limited to, the following:

Factors related to the 2021 Forest Plan:

- In 1993, the Recovery Plan articulated the conservation needs for the recovery of grizzly bears. The Recovery Plan stated that recovery zones include areas large enough and of sufficient habitat quality to support recovered grizzly bear populations, and that although grizzly bears are expected to reside in areas outside the recovery zones, only habitat within the recovery zone is needed for management primarily for grizzly bears. The 2021 Forest Plan applies to areas both within and outside of the recovery zone.

- We do not anticipate adverse effects as a result of food and attractant storage and site development, vegetation management and fire management, or energy and mineral development, except for the potential effects that may be associated with motorized access management or helicopter use.

- Effects related to motorized access management, helicopter use, and livestock grazing will vary depending on site-specific information. Not all actions related to motorized access, helicopter use, and livestock grazing that may be allowed and/or proposed under the 2021 Forest Plan will result in adverse effects.

- The existing (baseline) access condition, potential temporary road construction and use, and/or temporary use of restricted roads may result in some level of adverse effects to individual female grizzly bears within the action area, where they may be present.

- While motorized routes in some portions of the action area may result in displacement of some female grizzly bears from key habitat at some time over the life of the 2021 Forest Plan, some grizzly bears are able to persist in areas with higher levels of human pressure, as documented by verified reports of grizzly bears, including females with cubs (indicating home range use), outside of the recovery zones.

- Not all actions related to motorized access carried out under the 2021 Forest Plan, including the existing, baseline condition, will result in adverse effects to grizzly bears. In other words, we do not expect the existing, baseline condition in all portions of the action area to have ongoing adverse impacts on female grizzly bears. Nor do we expect all temporary roads or temporary use of restricted roads to have adverse effects on female grizzly bears. The level of effects would depend on such things as grizzly bear use in the action area, location and length of the road, the frequency and intensity of use of the road, and the duration that the road would be on the landscape. Not all females would experience the same effects, thus, some may not be adversely affected as a result of access management under the 2021 Forest Plan.

- As described above, while adverse effects from high road densities and low amounts of secure habitat in some portions of the action area may result in the displacement of individual female grizzly bears, the avoidance of suitable habitat, and/or the reduction of habitat to an unsuitable condition, we anticipate that the adverse effects would affect only a few adult females over the life of the 2021 Forest Plan.

- The late-season snowmobile closure dates are May 31 for the Copper Bowls extended use area within the recovery zone and range from April 15 to May 15 for the portion of the action area outside of the recovery zone.

- Where grizzly bears and snowmobiling do generally overlap, there is still some spatial separation. However, the potential of snowmobile use adversely impacting an individual grizzly bear cannot be eliminated.

- In total, approximately 120,826 acres of modeled denning habitat overlap authorized late season snowmobiling beyond March 31. This includes about 691 acres within the recovery zone and 120,135 acres outside of the recovery zone, much of which (112,535 acres) are located within NCDE zones 2 and 3 where grizzly bears are less likely to be denning. Many of these acres are relatively dry and snow can be intermittently present. Thus, not all areas legally open to over-snow motorized travel are actually available during the entire time they are open.

- Livestock management under the 2021 Forest Plan, especially if sheep allotments are added, has the potential to result in some level of adverse impacts to individual grizzly bears if livestock/grizzly bear conflicts occur. Some individual grizzly bears may become food conditioned or habituated to seek out livestock as prey, which may result in their removal.

- No documented grizzly bear mortalities associated with livestock have occurred within the action area.

- The 2021 Forest Plan provides management direction that would incorporate requirements into new or reauthorized grazing permits that reduce the risk of grizzly bear-human conflict and require reporting of livestock carcasses within 24 hours of discovery within the recovery zone and NCDE zone 1, prohibit increases in the number of sheep allotments or permitted animal unit months above the baseline within the recovery zone and NCDE zone 1, reduce the number of sheep allotments when opportunities arise in the recovery zone, limit potential conflict associated with weed control via small livestock within the recovery zone and NCDE zone 1, and prohibit increases in the number of active cattle grazing allotments in the recovery zone.

- Any changes to livestock grazing on the Forest that may occur at the site-specific level would proceed through a site-specific section 7 consultation, as appropriate.

- Based on the information for livestock grazing in the action area (the small number of sheep allotments, the standards within the recovery zone and NCDE zone 1, and the history of no grizzly bear mortalities associated with livestock), the likelihood of adverse impacts to grizzly bears related to livestock grazing in the action area during the life of the 2021 Forest Plan is very low, but cannot be ruled out entirely. Due to the long duration of the 2021 Forest Plan, the number of grizzly bears using the action area is expected to increase and livestock grazing will remain a potential risk, albeit low.

- While some adverse effects to individual grizzly bears may occur related to actions carried out under the 2021 Forest Plan, they are not expected to have a negative effect on the survival and recovery of the NCDE grizzly bear population.

- The Forest has managed and will continue to manage their lands in such a way that has allowed grizzly bears to expand. Thus, although individual grizzly bears may be adversely affected at times over the life of the 2021 Forest Plan, we anticipate that grizzly bears use will continue to increase within the action area into the future.

Factors related to the NCDE grizzly bear population:

- Kendall et al. (2009) produced a final total NCDE grizzly bear population estimate of 765 grizzly bears for 2004 (Ibid.), more than double the recovery plan estimate for that year.

- Kendall et al. (2009) also indicated that in 2004 (http://www.nrmsc.usgs.gov):

    1. Female grizzly bears were present in all 23 BMUs.
    2. The number and distribution of female grizzly bears indicated good reproductive potential.
    3. The occupied range of NCDE grizzly bears now extends 2.6 million acres beyond the 1993 recovery zone.
    4. The genetic health of NCDE grizzly bears is good, with diversity approaching levels seen in undisturbed populations in Canada and Alaska.
    5. The genetic structure of the NCDE population suggests that population growth occurred between 1976 and 2004.
    6. Human development is just beginning to inhibit interbreeding between bears living north and south of the U.S. Highway 2 corridor, west of the Continental Divide.

- Montana Fish, Wildlife and Parks research conducted between 2004 and 2011 indicated an increasing trend in numbers of NCDE grizzly bears (Mace and Roberts 2012). Costello et al. (2016) calculated a growth rate of 2.3 percent for grizzly bears in the NCDE. For the 6-year period of 2015 through 2020, the estimated annual survival rate for independent females within the demographic monitoring area was 93 percent (Costello and Roberts 2021).

- Assuming previously observed vital rates from Costello et al. 2016, the projected population size of grizzly bears in the NCDE for the management period 2019–2023, is 1,068 for 2019 increasing to 1,092 in 2020, 1,114 in 2021, 1,138 in 2022, and 1,163 in 2023 (Costello and Roberts 2021).

- From 2015 through 2020, the average annual number of total reported and unreported (TRU) mortalities for independent females within the DMA was 13, below the maximum threshold of 24 and the average annual number of TRU for independent males was 21, falling below the maximum threshold of 29 (Costello and Roberts 2021).

- The NCDE grizzly bear population currently meets the demographic recovery criteria related to the number of BMUs occupied by family groups and the sustainable human-

caused mortality levels for both total and female grizzly bears (U.S. Fish and Wildlife Service 2021c, Costello and Roberts 2021).

- The NCDE grizzly bear population is increasing, which explains the expansion of its range into areas outside the recovery zone. Female grizzly bears with young have been observed outside of the recovery zone, indicating that a number of females are able to find the resources needed to establish home ranges and survive and reproduce outside the recovery zone, despite the lack of specific habitat protections.

- Using verified grizzly bear locations, Costello et al. (2016) estimated that grizzly bears occupied an area of roughly 13.6 million acres, more than double the size of the recovery zone. The distribution of the NCDE grizzly bear population is estimated biannually. The estimated occupied range of the NCDE grizzly bear population during 2011 through 2020 was 67,652 square kilometers (16,717,173 acres), representing an increase of about 6 percent from the 2009-2018 estimate or an annual increase of about 3 percent (Costello and Roberts 2021).

- In part due to grizzly bear expansion into areas that had previously been unoccupied, the number of grizzly bear-human conflicts has generally increased. However, much of the recent grizzly bear mortality is primarily associated with conflicts arising from attractants on private lands rather than conflicts on public lands.

- The NCDE Food Storage Order is in effect throughout the NCDE recovery zone and several areas outside of the recovery zone on National Forest lands and Glacier National Park. These agencies have been successful at managing attractants on federal lands under the current NCDE food storage order.

- Montana Fish, Wildlife and Parks' bear specialist program is expected to continue to work with the public to reduce risks to grizzly bears on private and public lands. In cooperation with other agencies, this program has made notable strides toward an informed public and reduced the availability of attractants to grizzly bears on private and public lands.

- The NCDE encompasses 5.7 million acres, of which 1.7 million acres is wilderness and 962,000 acres is Glacier National Park, which contains highest quality grizzly bear habitat. Considering these lands only, nearly half of the NCDE is essentially roadless or free of motorized use (47 percent). Further, the Flathead National Forest, which makes up 40 percent of the NCDE recovery zone, currently contributes approximately 1.5 million acres of additional grizzly bear secure core area. The four other National Forests in the NCDE also provide additional substantial secure core areas.

- The majority of the NCDE is managed by the National Forest and National Park Service, whose access management outside of wilderness areas or otherwise protected area is directly based on IGBC Guidelines. The current access management conditions on Federal lands across the ecosystem have contributed to the recovery of grizzly bears in the NCDE.

Recovery zones were established to identify areas necessary for the recovery of a species and are defined as the area in each grizzly bear ecosystem within which the population and habitat criteria for recovery are measured. Recovery zones are areas adequate for managing and promoting the recovery and survival of grizzly bear populations (U.S. Fish and Wildlife Service 1993). Areas within the recovery zones are managed to provide and conserve grizzly bear habitat. The recovery zones contain large portions of wilderness and national park lands, which are protected from the influence of many types of human uses occurring on lands elsewhere. Multiple use lands are managed with grizzly bear recovery as a primary factor. As anticipated in the Recovery Plan, grizzly bear populations have responded to these conditions, have stabilized, and are increasing or at or near recovered levels in some recovery zones. In addition, the grizzly bears have been expanding and continue to expand their existing range outside of the recovery zones, as evidenced by the verified records of grizzly bears in many portions of the action area.

Grizzly bears outside the recovery zone probably experience a higher level of adverse impacts due to land management actions than do grizzly bears inside. As anticipated in the recovery plan, we expect more grizzly bears will inhabit the Forest in the future. We expect grizzly bears will occur outside of the recovery zone at lower densities than within the recovery zone as a result of suboptimal habitat conditions, which include higher road densities, fewer areas secure from motorized access, and more human presence.

Despite the growth of the human population and the increase in the number of grizzly bear-human conflicts and grizzly bear mortalities, the preponderance of evidence suggests an increasing number of grizzly bears in the NCDE recovery zone: a total population estimate of 1,068 grizzly bears (U.S. Fish and Wildlife Service 2020), an estimated positive population trend of 2.3 percent annually (Costello et al. 2016), and the current distribution of grizzly bears (*Ibid*.). Based on the best available information, the Service concludes that the status of the NCDE grizzly bear population is robust and is at or near recovery.

While the 2021 Forest Plan direction may result in some low level of non-lethal adverse effects to some of the individual female grizzly bears using the action area, considering the large size of the NCDE recovery zone, favorable land management within the recovery zone, and the robust status of this grizzly bear population, adverse effects on grizzly bears as a result of implementing the 2021 Forest Plan would not have negative effects on the status of the NCDE grizzly bear population. This population is robust, the recovery zone is large, and management within the recovery zone favors the needs of grizzly bears; these results signal successful federal land management related to grizzly bear recovery under the strategy detailed in the 1993 Recovery Plan. Therefore, we conclude that the 2021 Forest Plan is not likely to reduce the numbers, distribution, or reproduction of grizzly bears in the NCDE.

We do not expect any effects to individual grizzly bears that do not have all or a portion of a home range within the action area (the Forest). We do not expect the 2021 Forest Plan to have any negative effects to individual grizzly bears or to grizzly bear populations outside of the NCDE. In other words, we do not expect the 2021 Forest Plan to negatively affect grizzly bears within or connectivity with the surrounding grizzly bear ecosystems (Yellowstone, Cabinet-Yaak, Bitterroot) nor the ecosystems further away (North Cascades, Selkirks). Because the 2021 Forest Plan would not reduce the reproduction, numbers, or distribution of grizzly bears throughout the NCDE, the 2021 Forest Plan would not have negative impacts at the level of the entire listed entity. Thus, we conclude that the 2021 Forest Plan is not likely to reduce the

numbers, distribution, or reproduction of grizzly bears across their listed range. When considering this, along with the status of the overall grizzly bear population in the lower 48 states, we conclude that the level of adverse effects is not reasonably expected to reduce appreciably the likelihood of both the survival and recovery of the listed entity of grizzly bears as a whole. Accordingly, it is the Service's biological opinion that the effects of the 2021 Forest Plan on grizzly bears are not likely to jeopardize the continued existence of the grizzly bear.

II. CANADA LYNX

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.

Analysis of the Species Likely to be Affected

The biological assessment determined that the 2021 Forest Plan would likely adversely affect individual Canada lynx. Therefore, formal consultation with the Service was initiated and this revised 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.

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 action area for the analysis of effects of the 2021 Forest Plan includes the approximately 2,883,227 acres of Forest land within the administrative boundaries of the Forest. The action area also includes slightly more than 30,000 acres of Beaverhead-Deerlodge National Forest that is administered by the Forest as well as slightly more than 2,000 acres of Forest lands in isolated parcels outside of the administrative boundaries. 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. The Forest includes portions of 17 counties and is managed as 8 ranger districts including the Rocky Mountain, Lincoln, Helena, Townsend, White Sulphur Springs, Belt Creek, Judith, and Musselshell Ranger Districts.

The Forest straddles the continental divide and includes several island mountain ranges. Because of its diversity and extent, and because the island mountain ranges include unique ecological and social context, the action area is divided into 10 GAs. Some plan components in the revised plan are unique to individual GAs. 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 2021 Forest 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. The Forest is also further divided into 83 lynx analysis units (LAUs). 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.

Status of the Species within the Action Area

Lynx have been documented in portions of the action area, some as resident and others as transient. Most of the action area is outside of the current known lynx distribution. Within the action area, resident lynx are likely to occur within core areas, those areas with the strongest, long-term evidence of lynx persistence supported by sufficient quality and quantity of lynx habitat. These core areas occur within the action area on the Rocky Mountain Range GA, the

Upper Blackfoot GA, and the northern portion of the Divide GA. These GAs are well connected to large areas of lynx habitat on the adjacent National Forests and National Park.

The remaining GAs on the Forest likely provide secondary and/or peripheral habitat where lynx use is considered transient. 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). Within the action area, the Big Belts, Castles, Crazies, Elkhorns, and Little Belts GAs, along with a portions of the Divide GA provide secondary habitat while the Highwoods and Snowies GAs are considered peripheral habitat.

Overall, the action area contains some degree of lynx habitat. 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.

Potential lynx habitat was mapped and then modeled for vegetative structural stage. Table 15 of the biological assessment (U.S. Forest Service 2020) displays the amount of potential lynx habitat by GA. The table further displays amounts of snowshoe hare habitat and the amount of other habitat (non-snowshoe hare habitat at this time). The acres displayed in Table 15 of the biological assessment 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. However, the habitat 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.

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 NRMLD was amended to both the Helena and the Lewis and Clark 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 Rocky Mountain Range GA, Upper Blackfoot BA, and portions of the Divide GA are considered occupied while the island mountain ranges comprising the remaining seven GAs, along with portions of the Divide GA, are currently considered unoccupied.

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. Table 5 displays the type of vegetation management that is allowed under the existing Forest plans, however actual use on the ground is constrained by resource-specific standards and guidelines, including the NRLMD. Timber harvest is the removal of trees for wood fiber use and other multiple-use purposes. Timber production is the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use.

Table 5. Potential lynx habitat where timber harvest and production are currently allowed under the 1986 Forest plans (U.S. Forest Service 2020).

Allowable Use	Total Forest Acres	Acres in Occupied Lynx Habitat	Acres in Unoccupied Lynx Habitat
Timber Harvest	1,654,916	338,604	422,213
Timber Production	414,936	70,653	156,619

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 2021 Forest 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 (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. 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 Helena and Lewis and Clark 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 2021 Forest Plan and are represented in the acres described below.

On the Helena portion of the Forest, adverse effects could occur as a result of up to 19,047 acres treated under the WUI exemption and up to 579 acres treated under the exceptions for other resource benefits. Since issuance of the 2017 amended incidental take statement, the Helena portion of the Forest has treated or proposed to treat (i.e. has been through section 7 consultation) 655 acres using the WUI exemption and no acres using the other resource benefits exception. On the Lewis and Clark portion of the Forest, adverse effects could occur as a result of up to 27,979 acres treated under the WUI exemption and up to 20 acres treated under the exceptions for other resource benefits. Since issuance of the 2017 amended incidental take statement, the

Lewis and Clark portion of the Forest has treated or proposed to treat 1,414 acres using the WUI exemption and no acres using the other resource benefits exception. Additional acres were previously treated between 2007 and 2017 using the exemptions and/or exceptions to the NRLMD and were captured in the 2017 amended incidental take statement and not discussed further here. Figures 4 and 5 of the biological assessment (U.S. Forest Service 2020, as updated via additional information received during consultation) display vegetation management projects that have occurred in occupied lynx habitat on the Forest from 2007 through 2019, where the use of exemptions and/or exceptions to the NRLMD standards have been applied.

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. Table 19 of the biological assessment (U.S. Forest Service 2020) displays the amount of lynx habitat affected by wildland fire since 1987. Past and ongoing fuels reduction projects would be accounted for in the vegetation management described in the paragraphs above.

Livestock Management

The Forest has 240 active allotments on 1,355,143 acres of Forest lands (reference Table 3 above). Of those, 356,816 acres are in GAs that are currently considered occupied by lynx. The Forest permits use by 24,190 cattle, 79 horses, and 5,000 sheep for an average of 86,015 cattle head months (one month's occupancy and use by one animal), 122 horse head months, and 8,648 sheep head months. Grazing operations 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 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.

Table 18 in the biological assessment display these designations in relation to lynx habitat (U.S. Fish and Wildlife Service 2020). 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 361,680 acres of occupied potential lynx habitat is within congressionally designated wilderness. In addition to the limits associated with vegetation management described above, other human uses are constrained in these areas. Motorized and mechanized uses, including motorized over-snow travel, are not allowed. Recreation management in these areas focus on providing primitive experiences where the presence of humans is minimized. Additional designations, including RWAs, the Rocky Mountain Front Conservation Management Area, research natural areas, and others similarly constrain certain activities.

Two developed alpine ski areas are located on the Forest. Teton Pass Ski Area occurs within the Rocky Mountain Range GA, in occupied lynx habitat. Showdown Ski Area occurs within the Little Belts GA, in unoccupied lynx habitat. The effects of both ski areas on were previously consulted on in 2000. Winter recreation activities are guided by the human use objectives and guidelines in the NRLMD.

Roads

The Forest has approximately 2,600 miles of authorized motorized and non-motorized roads and trails across the action area. For more information on the existing conditions related to motorized access in the action area, see Tables 1 and 2 and the associated paragraphs in the grizzly bear section above. Other non-Forest roads, including Montana Highways 200, 12, and 89, 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, Montana Highways 87, 287, 191 and Interstate 15, occur between geographic areas at low elevations on mixed private and state lands and my contribute to the existing isolation of the island mountain ranges in the action area.

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 297 miles of over-the-snow motor vehicle use trails, with 182 of those miles being groomed. Within LAUs in unoccupied habitat, there are approximately 477 miles of over-the-snow motor vehicle use trails, with 292 of those miles being groomed. Only minor portions of these routes occur in wilderness study areas (less than 10 miles) and inventoried roadless areas (53 miles in unoccupied habitat and 40 miles in occupied habitat). Over-the-snow motor vehicle use in winter recreation areas is allowed on approximately 267,206 acres of occupied habitat and on 431,053 acres of unoccupied 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. 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 Elkhorns Wildlife Management Unit within the Elkhorns GA is also administratively withdrawn from oil and gas leasing, but could be available for other types of leasable minerals exploration and development. The entire Rocky Mountain Range GA, comprising 468,177 acres of occupied lynx habitat, is permanently withdrawn from future locatable or leasable minerals exploration or development. This area represents the majority of occupied lynx habitat on the Forest.

The only commercial hardrock mining rights on the Forest are for the Cotter Mine located in the Upper Blackfoot GA, which is within occupied lynx habitat. No mining activity is currently occurring at that site. Nine lease parcels occur within currently unoccupied lynx habitat (8 in the Big Belts GA and 1 in the Crazies GA). All nine are lease parcels are suspended pending further review and decision.

Decisions about leasing or permitting areas for minerals exploration or development are not made at the Forest Plan level and are tied to other processes occurring separately and subject to specific 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 averages roughly 30 active 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.).

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 2021 Forest Plan.

The 2021 Forest 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 and considered when management activities are planned in unoccupied lynx habitat. This revised biological opinion on the effects of the 2021 Forest 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 2021 Forest 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 2021 Forest Plan. While we analyze what the 2021 Forest Plan would allow, many activities that are allowed by the 2021 Forest 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 2021 Forest 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.

As described in the biological assessment, timber production under the 2021 Forest Plan (purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be

cut…for industrial or consumer use) could potentially be allowed on 62,480 acres of occupied lynx habitat and 126,953 acres of unoccupied lynx habitat, resulting in decreases of potential timber production on roughly 3 percent of occupied lynx habitat and roughly 4 percent of unoccupied lynx habitat over the existing condition. Under the 2021 Forest Plan, timber harvest (removal of trees for varied reasons) could potentially be allowed on 318,107 acres of occupied lynx habitat and 448,488 acres of unoccupied lynx habitat, resulting in a decrease of potential timber harvest on roughly 3 percent of occupied lynx habitat and an increase of potential timber harvest on roughly 4 percent of unoccupied lynx habitat over the existing condition. The NRLMD components in the 2021 Forest 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 western larch, 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 2021 Forest Plan may result in some level of disturbance effects to lynx if lynx are in the project area during project implementation. Such disturbance is expected to be insignificant as areas free of disturbance are typically available if a lynx needed to adjust movement patterns during implementation. 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 2021 Forest Plan. Treatments proposed under the 2021 Forest 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 (2021 Forest 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 2021 Forest Plan, the Forest has estimated that a maximum of 45,023 acres of occupied lynx habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 4,800 acres of occupied lynx habitat could be treated using the exceptions for activities for other resource benefit (U.S. Forest Service 2020). The total maximum amount of occupied lynx habitat that could be treated under the 2021 Forest Plan and NRLMD standards is 49,823 acres or about 6 percent of occupied lynx habitat in the action area. These acres are not likely all providing snowshoe hare habitat but could potentially provide it at some point over the life of the 2021 Forest Plan and could potentially result in adverse effects to lynx via impacts to snowshoe hare habitat. Thus, although unlikely, the worst case scenario of treating approximately 49,823 acres of snowshoe hare habitat over the life of the 2021 Forest Plan is considered for the purpose of this effects analysis (Table 6).

The biological assessment describes the amount of snowshoe hare habitat that has previously been treated since 2007 was 3,853 acres. Based on the amount of snowshoe hare habitat treated over the past 12 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 2021 Forest Plan, and in turn may adversely affect lynx, is analyzed here.

Table 6. Acres of snowshoe hare habitat that may be treated in occupied and unoccupied lynx habitat under the 2021 Forest Plan using the exemptions from and/or exceptions to the NRLMD vegetation standards (adapted from U.S. Forest Service 2020).

	Occupied Lynx Habitat	Unoccupied Lynx Habitat*	TOTAL
Total Acres of Lynx Habitat	830,376	649,351	1,479,727
Acres of Lynx Habitat in WUI	200,824	362,731	563,555
Maximum Acres of Snowshoe Hare Habitat Treated Using Exemptions for Fuel Treatment Projects in the WUI	45,023	40,727	85,750
Maximum Acres of Snowshoe Hare Habitat Treated Using Exceptions for Activities for Other Resource Benefits	4,800	3,200	8,000
Total Acres of Snowshoe Hare Habitat Treated Using Exemptions and/or Exceptions	49,823	43,927	93,750
Percent of Occupied or Unoccupied Lynx Habitat	**6 %**	**6.8 %**	**6.3 %**

*In unoccupied lynx habitat application of the NRLMD is not required and vegetation treatments need only to consider the NRLMD. Thus, treatment of snowshoe hare habitat may not be limited to the acres displayed in this table.

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 2021 Forest 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 6 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 2021 Forest 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 2021 Forest 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 48 occupied LAUs and 35 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 45,023 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 4,800 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.

While the Forest must apply the NRLMD in occupied lynx habitat, they only need to consider applying the NRLMD in unoccupied habitat. Under the 2021 Forest Plan, the Forest has estimated that approximately 40,727 acres of unoccupied lynx habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 4,800 acres of unoccupied lynx habitat could be treated using the exceptions for activities for other resource benefit (Table 6). Since application of the NRLMD is not required in unoccupied lynx habitat and vegetation treatments only need to consider the NRLMD, 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 as displayed in Table 6.

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 2021 Forest Plan, these activities are expected to result in insignificant effects. Based on the types of activities that would typically be proposed under the 2021 Forest 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 2021 Forest 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 49,823 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 adequate densities of snowshoe hares to support continual lynx presence.

Fire Management

The 2021 Forest Plan states that fire management will strive to balance the natural role of fire while minimizing the impacts from fire on values to be protected. All wildfire management decisions will be made with the primary consideration given to both the health and safety of the public and of fire personnel. Under the 2021 Forest 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.

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 Forest Service has identified one objective and four guidelines related to livestock management. Objective GRAZ O1 guides 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 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 and may improve the habitat over baseline conditions.

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 2021 Forest 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 six ROS classes ranging from primitive (designated wilderness, recommended wilderness areas, and others) to rural (such as areas immediately adjacent to small communities or private land inholdings, and others), to urban. The 2021 Forest Plan designates or identifies specific areas in which management would emphasize recreation values, such as the South Hills and the Grandview Recreation Areas, and others. The 2021 Forest Plan also identifies two existing alpine ski areas: Teton Pass Ski Area in occupied lynx habitat and Showdown Ski Area in unoccupied lynx habitat. 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 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 2021 Forest 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 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. Two existing ski areas are located within the action area. Teton Pass Ski Area is located in occupied lynx habitat and was previously consulted on in a 2001 programmatic biological opinion on ski resorts in Montana. While individual lynx may be affected, the Service determined that operations of ski areas within Montana would not jeopardize or otherwise impact the lynx population. The insignificant effects of an expansion of the Teton Pass Ski Area were consulted on in 2010. The effects of any future expansions related to the Teton Pass Ski Area would be analyzed site-specifically and site-specific consultation would occur as applicable. The Showdown 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 2021 Forest 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. Such effects may sometimes be adverse via 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 2021 Forest Plan includes desired conditions to continue to supply energy and minerals

resources while ensuring the sustainability and resiliency of other resources, including wildlife habitat, are not compromised or degraded. 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 2021 Forest Plan would likely result in either no effects or only minor, insignificant effects to lynx depending upon the scale of development.

Linkage Areas

The 2021 Forest 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 guides the Forest 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 because lynx have large home ranges and may move long distances. Thus, without coordination, the effects of mixed ownership patterns on lynx would likely lead to reductions in habitat connectivity. Standard LINK S1 requires the Forest to identify potential highway crossings when highway or forest highway construction or reconstruction is proposed in linkage areas. In addition, Guideline LINK G1 guides the Forest 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 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.

The objective, standards, and guidelines described above would reduce or minimize the potential for effects to lynx in most cases, and therefore the 2021 Forest Plan, incorporating the NRLMD, would ultimately conserve adequate connectivity with occupied lynx habitat. The site-specific

effects of projects proposed under the 2021 Forest Plan that may impact connectivity would be analyzed during project-specific consultation. Squires et al. (2013) concluded that while changes to habitat structure can affect lynx movement, there is no evidence that genetic isolation is an issue. We do not anticipate Forest actions carried out under the 2021 Forest Plan would result in adverse impacts to lynx connectivity. Such actions are not likely to create a barrier or impede lynx movements.

Effects Summary for Canada Lynx

The Forest Service designed the NRLMD to address those risk factors to lynx that were relevant in terms of Forest Plan direction. Overall, the 2021 Forest 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 2021 Forest 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 2021 Forest 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 45,023 acres of occupied lynx habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 4,800 acres of occupied lynx habitat could be treated using the exceptions for activities for other resource benefit. 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 2021 Forest Plan. Thus, although unlikely, the worst case scenario of treating approximately 49,823 acres of snowshoe hare habitat over the life of the 2021 Forest Plan is considered for the purpose of this effects analysis. Acres of snowshoe hare habitat treated are expected to be distributed throughout the action are 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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.

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 revised 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 2,883,227 acres of Forest land within the administrative boundaries of the Forest. The action area also includes slightly more than 30,000 acres of Beaverhead-Deerlodge National Forest that is administered by the Forest as well as slightly more than 2,000 acres of Forest lands in isolated parcels outside of the administrative boundaries. 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. This includes approximately 13,800 acres of state land, 310,727 acres of private land, 53 acres of county land, and 734 acres of city land.

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. 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 affects 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.

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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 revised biological opinion.

- The 2021 Forest 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 2021 Forest Plan clearly conserves and promotes snowshoe hare and lynx habitat within the action area.

- The 2021 Forest 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.

- However, 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 2021 Forest 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 45,023 acres of occupied lynx habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 4,800 acres of occupied lynx habitat treated using the exceptions for activities for other resource benefit. As previously described, the total treatment of 49,823 acres of snowshoe hare habitat is not likely to occur. Although unlikely, the worst case scenario of treating approximately 49,823 acres of snowshoe hare habitat over the life of the 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest Plan are expected to have relatively minor or less substantial impacts on lynx.

- Activities proposed under the 2021 Forest 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 2021 Forest Plan. We conclude that the adverse effects of the 2021 Forest 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 2021 Forest 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.

III. DESIGNATED CANADA LYNX CRITICAL HABITAT

CRITICAL HABITAT DESCRIPTION

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.

Analysis of Critical Habitat Likely to be Affected

The biological assessment determined that the 2021 Forest Plan may adversely affect lynx critical habitat. Therefore, formal consultation with the Service was initiated and this revised 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.

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 2021 Forest Plan on lynx critical habitat includes the GAs that occur within the portion of designated lynx critical habitat Unit 3, Northern Rocky Mountains critical habitat unit. This includes the Rocky Mountain GA, the Upper Blackfoot GA, and the portion of the Divide GA north of Highway 12. This area is approximately 1,099,991acres (1,830 square miles). The remaining areas of the Forest have not been designated as lynx critical habitat.

In order to fully address effects of the 2021 Forest 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. The Forest is also further divided into LAUs. 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.

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 PCE1d, 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 26 of the biological assessment (U.S. Forest Service 2020) displays the amount of lynx critical habitat within the action area. Within the total of 1,099,991 acres of lynx critical habitat, approximately 715,695 acres are mapped as lynx habitat while the remaining 395,222 acres are mapped as PCE 1d or matrix habitat (the numbers don't add up exactly due to minor data inconsistencies and rounding errors). The table also displays amounts of PCE 1a and PCE 1c. 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.

Factors Affecting Species Environment 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 NRMLD was amended to both the Helena and the Lewis and Clark 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.

<u>Vegetation Management</u>

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. Timber harvest is the removal of trees for wood fiber use and other multiple-use purposes. Timber harvest is allowed on approximately 481,464 acres of lynx critical habitat (44 percent) in the action area. Timber production is the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. Timber production is allowed on approximately 74,086 acres of lynx critical habitat (7 percent) in the action area. 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 2021 Forest 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 Helena and Lewis and Clark 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 Helena portion of the Forest, adverse effects could occur as a result of up to 14,857 acres of PCE 1a treated under the WUI exemption and up to 579 acres of PCE 1a treated under the exceptions for other resource benefits. Since issuance of the 2017 biological opinion, the Helena portion of the Forest has not treated any acres of PCE 1a using the WUI exemption or the other resource benefits exception. On the Lewis and Clark portion of the Forest, adverse effects could occur as a result of up to 26,300 acres of PCE 1a treated under the WUI exemption and up to 20 acres of PCE 1a treated under the exceptions for other resource benefits. Since issuance of the 2017 biological opinion, the Lewis and Clark portion of the Forest has treated 1,414 acres of PCE 1a using the WUI exemption and no acres using the other resource benefits exception. Additional acres of PCE 1a may have been previously treated between 2007 and 2017 as a result of the Forest using the exemptions and/or exceptions to the NRLMD and were captured in site-specific project consultations and are not discussed further here. Figures 10 and 11 of the biological assessment (U.S. Forest Service 2020) display vegetation management projects that have occurred in lynx critical habitat on the Forest from 2007 through 2019.

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, approximately 424,251 acres of lynx critical habitat have 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

The Forest permits use by 24,190 cattle, 79 horses, and 5,000 sheep for an average of 86,015 cattle head months (one month's occupancy and use by one animal), 122 horse head months, and 8,648 sheep head months. Across the entire Forest, 240 active allotments occur on 1,355,143 acres of Forest lands (reference Table 3 above). Of those, 270,305 acres are located within designated lynx critical habitat. 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. Non-motorized summer recreation is allowable on 946,190 acres (86 percent) of lynx critical habitat, while winter non-motorized recreation is allowed on 864,251 acres (79 percent) of lynx critical habitat. Motorized recreation is addressed below. 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.

Of the critical habitat in the action area, 47 percent occur in designated wilderness, 42 percent in Inventoried Roadless Areas, and 5 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 uses, including motorized over-snow travel, are not allowed. Recreation management in these areas focus on providing primitive experiences where the presence of humans is minimized. Additional designations, including RWAs, research natural areas, and others similarly constrain certain activities.

Two developed alpine ski areas are located on the Forest. Teton Pass Ski Area occurs within the Rocky Mountain Range GA, in lynx critical habitat. Showdown Ski Area occurs within the Little Belts 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 153,801 acres (14 percent) of lynx critical habitat. For more information on the existing conditions related to motorized access in across the Forest, see Tables 1 and 2 and the associated paragraphs in the grizzly bear section above (not all of these roads 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 201 miles of over-the-snow motor vehicle use trails, with 108 miles of those being groomed, occur within LAUs located in lynx critical habitat. Only minor portions of these routes occur in wilderness study act areas (less than 10 miles) and inventoried roadless areas (34 miles in lynx critical habitat). Over-the-snow motor vehicle use in winter recreation areas is allowed on approximately 203,013 acres (18 percent) of lynx 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. However, the entire Rocky Mountain Range GA is permanently withdrawn from future locatable or leasable minerals exploration or development.

The only commercial hardrock mining rights on the Forest are for the Cotter Mine located in the Upper Blackfoot GA, which is within lynx critical habitat. No mining activity is currently occurring 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 averages roughly 30 active 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 (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 were 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*.).

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 2021 Forest Plan.

The 2021 Forest 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 in most cases is also lynx critical habitat. This revised biological opinion on the effects of the 2021 Forest 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 2021 Forest 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 2021 Forest Plan. While we analyze what the 2021 Forest Plan would allow, many activities that are allowed by the 2021 Forest 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 2021 Forest 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.

As described in the biological assessment, timber production under the 2021 Forest Plan (purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut…for industrial or consumer use) could potentially be allowed on 60,793 acres of lynx critical habitat, resulting in a decrease of potential timber production on roughly 1 percent of lynx critical habitat over the existing condition. Under the 2021 Forest Plan, timber harvest (removal of trees for varied reasons) could potentially be allowed on 463,655 acres of lynx critical habitat, resulting in a decrease of potential timber harvest on roughly 2 percent of lynx critical habitat over the existing condition. The NRLMD components in the 2021 Forest Plan components 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 (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 western larch, 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 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.

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 2021 Forest 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 2021 Forest Plan. Treatments within lynx critical habitat proposed under the 2021 Forest 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 2021 Forest 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). 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 (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.

Under the 2021 Forest Plan, the Forest has estimated that a maximum of 38,142 acres of lynx critical habitat PCE 1a could be treated using the exemptions for fuel treatment projects within the WUI and an additional 4,357 acres of lynx critical habitat PCE 1a could be treated using the exceptions for activities for other resource benefit (U.S. Forest Service 2020). The total maximum amount of PCE 1a that could be treated under the 2021 Forest Plan and NRLMD standards is 42,499 acres, which is approximately 4 percent of the critical habitat in the action area. These acres are not likely all providing PCE 1a but could potentially provide it at some point over the life of the 2021 Forest Plan and could potentially result in adverse effects to lynx critical habitat via impacts to PCE 1a. Thus, although unlikely, the worst case scenario of treating approximately 42,499 acres of PCE 1a over the life of the 2021 Forest Plan is considered for the purpose of this effects analysis (Table 7).

The biological assessment describes the amount of PCE 1a that has previously been treated since 2007 was 585 acres. Based on the amount of PCE 1a treated over the past 12 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. However, because future activities are unknown, the maximum amount of PCE 1a that could be treated over the life of the 2021 Forest Plan, and in turn may adversely affect lynx critical habitat, is analyzed here.

Table 7. Acres of PCE1a that may be treated in lynx critical habitat under the 2021 Forest Plan using the exemptions from and/or exceptions to the NRLMD vegetation standards (adapted from U.S. Forest Service 2020).

	Lynx Critical Habitat
Total Acres of Lynx Critical Habitat in the Action Area	1,099,991
Acres of Lynx Critical Habitat in WUI	271,307
Acres of Mapped Lynx Habitat within Lynx Critical Habitat in WUI	149,915
Maximum Acres of PCE 1a Treated Using Exemptions for Fuel Treatment Projects in the WUI	38,142
Maximum Acres of PCE 1a Treated Using Exceptions for Activities for Other Resource Benefits	4,357
Total Acres of PCE 1a Treated Using Exemptions and/or Exceptions	42,499
Percent of PCE 1a Treated within Lynx Critical Habitat	**4 %**

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 2021 Forest 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 7 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.

The 2021 Forest 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 2021 Forest 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 2021 Forest Plan would occur on no more than 38,142 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 4,357 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 2021 Forest 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 42,499 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 2021 Forest Plan states that fire management will strive to balance the natural role of fire while minimizing the impacts from fire on values to be protected. All wildfire management decisions will be made with the primary consideration given to both the health and safety of the public and of fire personnel. Under the 2021 Forest 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 protected 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 2021 Forest 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*."

Recreation Management
Recreation settings are categorized into six ROS classes ranging from primitive (designated wilderness, recommended wilderness areas, and others) to rural (such as areas immediately adjacent to small communities or private land inholdings, and others), to urban. The 2021 Forest Plan designates or identifies specific areas in which management would emphasize recreation values, such as the South Hills and the Grandview Recreation Areas, and others. The 2021 Forest Plan also identifies one existing alpine ski area within lynx critical habitat (Teton Pass 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 2021 Forest 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 2021 Forest 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. 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.

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.

Teton Pass Ski Area is located in lynx critical habitat. Based on the information provided by the critical habitat final rule (79 FR 54823), the developed portions of the Teton Pass 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 Teton Pass 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 2021 Forest 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 2021 Forest 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 2021 Forest Plan includes desired conditions to continue to supply energy and minerals resources while ensuring the sustainability and resiliency of other resources,

including wildlife habitat, are not compromised or degraded. 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 2021 Forest 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 2021 Forest 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 2021 Forest Plan that may impact connectivity would be analyzed during project-specific consultation. Squires et al. (2013) concluded that while changes to habitat structure can affect lynx movement, there is no evidence that genetic isolation is an issue. We do not anticipate Forest actions carried out under the 2021 Forest 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 2021 Forest Plan and NRLMD, linkage and connectivity within lynx critical habitat would continue to serve their intended conservation role for lynx.

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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest Plan that occur within PCE 1a (snowshoe hare habitat). A maximum of 38,142 acres of lynx critical habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 4,357 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 2021 Forest Plan. Thus, although unlikely, the worst case scenario of treating approximately 42,499 acres of PCE 1a over the life of the 2021 Forest Plan is considered for the purpose of this effects analysis. Acres of PCE 1a treated are expected to be distributed throughout the action are 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 2021 Forest 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 2021 Forest 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 2021 Forest 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.

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 revised 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 3, Northern Rocky Mountains critical habitat unit. This includes the Rocky Mountain GA, the Upper Blackfoot GA, and the portion of the Divide GA north of Highway 12. This area is approximately 1,099,991acres (1,830 square miles). Within the action area, approximately 26,271 acres of critical habitat occur on state (6), county (1), and private (26,264) lands. As such, about 2 percent of critical habitat in the action area is in non-federal ownership. Thus, while some non-federal land occurs within the action area, the Forest manages the majority 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. 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.

CONCLUSION

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 2021 Forest 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 2021 Forest 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 3 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 2021 Forest 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 2021 Forest 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 revised biological opinion.

- The 2021 Forest Plan and NRLMD address land management actions that have the most potential to adversely affect key lynx habitat components. The 2021 Forest Plan, along with the NRLMD that is to be followed under the 2021 Forest 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 2021 Forest 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 2021 Forest 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 38,142 acres of lynx critical habitat could be treated using the exemptions for fuel treatment projects within the WUI and an additional 4,357 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 2021 Forest Plan. Thus, as previously described, the total treatment of 42,499 acres of PCE 1a is not likely to occur. Although unlikely, the worst case scenario of treating approximately 42,499 acres of PCE 1a over the life of the 2021 Forest 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 4 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 3 as a whole. The entire action area (1,099,991 acres) is approximately 17.6 percent of the entire critical habitat Unit 3, which is approximately 9,783 square miles or 6,261,095 acres. The adverse effects of treating up to 42,499 acres of PCE 1a under the 2021 Forest Plan would occur on a very small portion of Critical Habitat Unit 3, approximately 0.7 percent of critical habitat Unit 3. Thus, the impacts on critical habitat Unit 3 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 2021 Forest Plan would maintain snowshoe hare habitat in adequate amounts to sustain snowshoe hare populations.

- The largest land owner within Critical Habitat Unit 3 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 Critical Habitat Unit 3 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 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. Total acres of impact to PCE 1a on all National Forests, including 2021 Forest Plan, and the MiFO within critical habitat in Unit 3 could potentially occur on no more than approximately 256,866 acres, which is approximately 4.0 percent of all critical habitat in Unit 3 (Unit 3 is 9,783 square miles or 6,261,120 acres). Thus, the impacts on Critical Habitat Unit 3 is relatively small and would not appreciably diminish the value of critical habitat for the conservation of lynx.

- Therefore, while vegetation and fire management projects under the 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest Plan. We conclude that the adverse effects of the 2021 Forest 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.

INCIDENTAL TAKE STATEMENT

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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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)].

Grizzly Bears

Amount or Extent of Take Anticipated

Access management

Based on research detailed earlier in this revised biological opinion, the Service has defined harm of grizzly bears in terms of adverse habitat conditions caused by high motorized route densities, resulting in low amounts of secure habitat, which may displace individuals from key habitat to the extent that significant under-use of habitat by grizzly bears may occur. Using the best information on the effects of motorized access on grizzly bears, we conclude that existing high motorized route densities and associated low amounts of secure habitat 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 2021 Forest Plan, primarily those that attempt to establish and maintain home ranges within the action area. Future temporary road construction and/or temporary use of restricted routes may add to or increase the likelihood of such adverse effects. These adverse effects would result from displacement of grizzly bears from essential habitat. Displacement may result in significant under-use of key habitat when high amounts of motorized access exist on the landscape. 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.

Portions of the action area have high levels of motorized routes while other portions have low levels of motorized routes or no motorized routes at all. With the exception of the subunits within the recovery zone, we have previously analyzed portions of the action area using only linear motorized route density or an estimate of low, medium, or high levels of motorized use. Providing the linear route density gives an idea of the amount of roads in the action area, however it does not represent how these routes occur on the landscape. For example, portions of the GBAUs may have high route densities (even within the GBAUs with lower overall linear route densities) while other portions of the GBAUs may have low route densities or even no motorized routes (even within the GBAUs with higher overall linear route densities). Secure habitat has been identified as one of the key issues related to effects of motorized access on grizzly bears and is important to the survival and reproductive success of grizzly bears. Secure habitat more adequately represents the potential effects related to motorized access as it provides a more accurate indication of the spatial mix of motorized routes and secure habitat. Thus, we have incorporated secure habitat into this analysis and incidental take statement.

Due to some concerns with the access data in portions of the action area outside of the recovery zone and in order to be conservative when analyzing effects to grizzly bears, all existing routes are buffered, regardless of whether they are legally open or closed to public travel, when delineating secure habitat outside of the recovery zone. As such, the estimates of secure habitat are in most cases underestimates of actual secure habitat that exists on the ground because an unknown number of routes that are physically impassable to motor vehicle use have not been updated within the access database and thus were excluded from secure habitat polygons. In addition, since the Forest has no management authority over non-Forest lands, lands not administered by the Forest were also buffered out of the secure habitat analysis. While it is possible that non-Forest land may provide secure habitat, such information is often unknown and the Forest lacks management authority over non-Forest lands. Thus, to be conservative when analyzing effects to grizzly bears, so as to not miss any potential effects, non-Forest land is buffered out of the secure habitat metric and the secure habitat analysis includes only secure habitat on Forest land. Accordingly, the secure habitat amounts provided are useful mainly as a broad index of what may be available to grizzly bears that may use the action area outside of the recovery zone. The Forest is expected to update the secure habitat metrics as they update their access data during site-specific project planning. These updates are not a result of changes on the ground. As the access database is updated, the improved information will better reflect the existing conditions related to secure habitat in the GBAUs.

No subunits within the recovery zone have existing conditions that may be resulting in ongoing significant effects to grizzly bears. Outside of the recovery zone, the estimated amount of secure habitat ranges from a low of 4 percent in the Sheep Creek GBAU to a high of 62 percent in the Highwoods GBAU. Of all 21 GBAUs, 1 has less than 10 percent secure habitat, 2 have between 11 and 20 percent secure habitat, 5 have between 21 and 30 percent secure habitat, 5 have between 31 and 40 percent secure habitat, 3 have between 41 and 50 percent secure habitat, 3 have between 51 and 60 percent secure habitat, and 2 greater than 60 percent secure habitat. The effects of the existing motorized access conditions throughout the action area, including the recovery zone and NCDE zones 1, 2, and 3, result in some level of ongoing affects, including some adverse effects, that will continue during the life of the 2021 Forest Plan. Ongoing displacement of grizzly bears may be occurring due to the potentially significant under-use of key habitat by female grizzly bears and may constitute incidental take of grizzly bears through "harm" as a result of significant habitat alteration that impairs breeding, feeding and/or sheltering. It is likely that portions of all or most of the GBAUs have existing conditions that may be resulting in such ongoing significant effects to grizzly bears if or when females grizzly bears are present.

Based on the information provided by the Forest, the potential effects of permanent route construction on secure habitat depend entirely on the location of the new route and the existing secure habitat polygons. For example, a permanent road could be constructed completely outside of secure habitat, as well as the 500 meter buffer, and would have no effect on secure habitat. A different example could include permanent route construction through the middle of a secure habitat polygon, potentially resulting two polygons of habitat that no longer provide secure habitat (depending on size, etc.). Other examples of permanent route construction would result in effects that fall somewhere in between these two examples. Thus, we cannot reasonably estimate the impacts that future permanent motorized route construction would have on secure habitat and site-specific analyses would need to occur for any permanent motorized route

construction that may be proposed in the future. Therefore, permanent motorized route construction will not be addressed in this incidental take statement.

Vegetation management actions often require the construction and use of temporary roads or temporary use of restricted roads for motorized access. Construction of and motorized use of temporary roads or restricted roads may increase the likelihood of disturbance and displacement of grizzly bears in or near a project area. While not specifically proposed under the 2021 Forest Plan, temporary road construction and use or temporary use of restricted roads may occur on a project by project basis. Temporary roads built for resource extraction such as timber harvest or mining may be short-term in duration of use or may remain on the landscape for several years and receive a substantive amount of use.

In sum, existing motorized access in some areas and continued presence of these motorized routes under the 2021 Forest Plan, along with temporary road construction and use and restricted road use, may result in incidental take of some individual female grizzly bears attempting to establish or maintain home ranges in roaded areas at some point over the life of the 2021 Forest Plan. We anticipate 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.

We do not anticipate any take of subadult or male grizzly bears. Male grizzly bears have larger home ranges than females, and 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). Such individuals are highly mobile and not restricted to finding food and shelter within a home range. Thus, while displacement may affect behavioral patterns such as feeding or sheltering, we do not anticipate such effects would cause injury to transient, subadult, or male grizzly bears.

As detailed in this revised biological opinion, we anticipate that existing access management, temporary motorized route construction and use, and temporary use of restricted roads would affect only a very few adult females over the over the life of the 2021 Forest Plan because grizzly bears occur at low densities in the action area and numbers of females are expected to increase only slowly over time in much of the action area. Also, substantial increases in road densities are not expected. If subadult females move into portions of the action area further away from the recovery zone seeking to establish home ranges, they would be exposed to levels of roading that would factor into home range selection, and that level of roading is not likely to significantly increase. Therefore, the take we anticipate would be harm to only a very low number of female grizzly bears that may inhabit the action area now and into the future, over the life of the 2021 Forest Plan. We expect harm would be caused by significant under-use of key habitat in areas affected by high road densities to levels that result in decreased fitness and impaired reproductive potential. In other words, infrequently and in site-specific circumstances, an adult female grizzly bear wary of humans and human-generated disturbance may not breed at its potential frequency or may fail to complete gestation due to decreased fitness. We do not expect all adult female grizzly bears affected by high road densities to suffer impairment of breeding, feeding, and/or sheltering, nor would we expect any female to experience permanent effects (lasting more than one reproductive cycle). Variables such as annual climate and resulting habitat and food resource conditions, the level of roading, and the number of grizzly bears using an area may change over time and are all factors influencing the displacement within a home range.

The effects of high road densities on individual female grizzly bears are difficult to quantify in the short term and may be measurable only as long-term effects on the species' habitat and population levels. The amount of take is difficult to quantify for the following reasons:

1) The amount of take would depend on the number of adult female grizzly bears impacted by high road densities. We lack specific information on the precise number of adult female grizzly bears that have home ranges encompassing all or portions of the action area.
2) Individual grizzly bears would react differently to the disturbance. Not all adult female bears that are exposed to disturbances from high road densities would be adversely impacted to the point of take. Low numbers of grizzly bears would likely decrease intra-specific competition for habitat, allowing more options for individuals to move within home ranges in many cases.
3) Some individual female grizzly bears that initially may be sensitive to disturbances may adjust to the routine disturbances generated by human activity over time.

Therefore, determining the precise amount of take, as defined by impaired reproductive potential (as affected by feeding and sheltering), is difficult. The amount of take would be also difficult to detect for the following reasons:

1) Grizzly bears are not easily detected or observed in the wild.
2) Reproductive rates of female grizzly bears vary naturally due to environmental and physiological causes.
3) A reduction in "normal" reproductive success is not discernable in the wild.
4) The reasons a grizzly bear fails to breed and/or failure to complete gestation are not discernable in the wild.

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. The number of grizzly bears that use the action area is unknown but grizzly bears have been documented. However, female grizzly bears have yet to be verified within portions of the action area. The mechanism of female grizzly bear dispersal makes it likely that only relatively few female grizzly bears would occupy much of the action area during the life of the 2021 Forest Plan. Therefore, for reasons explained above, the Service anticipates that incidental take of adult female grizzly bears would be very low and would occur only infrequently over the life of the 2021 Forest Plan in the form of harm related to the displacement effects of existing motorized access, temporary road construction and use, and temporary use of restricted roads.

We do not expect incidental take associated with the existing motorized access conditions within any of the subunits in the recovery zone. As secure habitat more adequately represents the potential effects related to open and restricted motorized access because it provides a more accurate indication of the spatial mix of motorized routes and secure habitat, we use the existing

amount of secure habitat on Forest lands within the action area GBAUs (outside of the recovery zone) as our **first surrogate measure of incidental take of grizzly bears** related to the existing motorized access conditions outside the recovery zone. Table 8 below displays the first surrogate measures of incidental take.

The existing motorized access conditions were determined using the best available information. Due to some concerns with the access data in portions of the action area outside of the recovery zone and in order to be conservative when analyzing effects, all existing routes are buffered, regardless of whether they are legally open or closed to public travel when delineating secure habitat. As such, the estimates of secure habitat displayed in Table 8 below are in most cases underestimates of actual secure habitat that exists on the ground because an unknown number of routes that are physically impassable to motor vehicle use have not been updated within the access database and thus were excluded from secure habitat polygons. The Forest is expected to update the secure habitat metrics as they update their access data during site-specific project planning in order to more accurately portray what is on the ground at the time of this consultation. Since secure habitat was likely underestimated, it is likely that updates to the amount of secure habitat in GBAUs would either not change or would increase.

In addition, the Service recognizes that improved information may be documented and mapping and calculation errors can occur. If the Forest updates the secure habitat metrics to better reflect existing conditions (no changes on the ground) or finds that it has new information or has made a mapping or calculation error in describing the existing condition and corrects the metrics, the Service does not expect any additional incidental take of grizzly bears related to those corrections because the changes would not reflect any actual changes on the ground. The intent of this incidental take statement is to capture the existing access conditions, including potential incidental take that may not be represented in the metrics described above due to potential errors or lack of information at the time of consultation.

Table 8. Estimated existing secure habitat within the action area outside of the NCDE recovery zone (U.S. Forest Service 2020, U.S. Forest Service 2021).

GBAU	Total Acres of Forest Lands	Acres of Potential Secure Habitat (Percent of Forest land in GBAU)
Dalton Mountain	82,276	31,892 (39%)
Humbug	66,966	30,555 (46%)
Boulder River BDNF	30,973	13,023 (42%)
Casey Peak	60,455	35,069 (58%)
Crow Creek	69,822	29,679 (43%)
Lazyman	64,415	11,891 (18%)
North Divide	72,195	16,484 (23%)
Spotted Dog	66,723	18,942 (28%)
Middle Big Belts	70,743	25,908 (37%)
North Big Belts	171,431	77,898 (45%)
South Big Belts	67,118	20,019 (30%)
Dry Wolf	74,307	26,394 (36%)
Elephant	199,743	48,705 (24%)
Pilgram	72,942	40,168 (55%)

Middle Fork Judith	110,601	67,089 (61%)
Sheep Creek	127,729	5,006 (4%)
Tenderfoot-Smith	113,449	58,612 (52%)
Upper Belt Creek	103,762	33,302 (32%)
Highwoods	42,290	26,368 (62%)
Castles	69,708	7,325 (11%)
Crazies HLC	57,667	22,154 (38%)

Over the life of the 2021 Forest Plan, temporary roads may be constructed and used related to site-specific projects. In addition, restricted roads may be temporarily used for site-specific projects.

Within the recovery zone, PCA-NCDE-STD-04 allows projects to temporarily increase OMARD by 5 percent, temporarily increase TMARD by 3 percent, and temporarily decrease secure core by 2 percent using a 10-year running average. As previously described, the effects guidance for OMARD, TMARD, and secure core describes that adverse effects to grizzly bears are likely to occur when OMARD exceeds 1 mile per square mile in more than 19 percent of the subunit, TMARD exceeds 2 miles per square mile in more than 19 percent of the subunit, and secure core is not at least 68 percent of the subunit during the non-denning period. Incidental take related to temporary projects will only occur when temporary changes to access conditions cause OMARD to exceed 1 mile per square mile in more than 19 percent of the subunit, TMARD to exceed 2 miles per square mile in more than 19 percent of the subunit, or secure core to decrease below 68 percent of the subunit. While changes in road density and/or secure core will be temporary, adverse effects and incidental take may occur while these changes are implemented on the ground. PCA-NCDE-STD-02 requires that administrative use on roads with public restrictions does not exceed either 6 trips (3 round trips) per week or 1 thirty-day unlimited use period during the non-denning season. Temporary project implementation within the recovery zone should not exceed 5 years (PCA-NCDE-GDL-01). Further, guideline PCA-NCDE-GDL-02 ensures that pre-project conditions (i.e., OMRD, TMRD, secure core) would generally be restored within 1 year of project completion. While the 2012 planning rule allows the Forest to deviate from guidelines so long as they meet the purpose of the guidelines, it is not known at this time what other scenarios may be used to meet the purpose of these guidelines. Thus, these guidelines, as written, will be used as part of our surrogate measure of take. If the purpose of the guidelines are met in a different way, site-specific consultation may be necessary depending on the site-specific information and effects.

Outside of the recovery zone, the Forest estimated that secure habitat may be temporarily impacted by the construction of temporary project roads or temporary use of restricted roads by an average of 2.5 percent and no more than 7 percent at any given time in any individual GBAU over the life of the 2021 Forest Plan. The temporary changes in the effectiveness of secure habitat, which may occur during implementation of vegetation management projects, would not likely occur in more than six GBAUs in total during that time and likely in no more than two adjacent GBAUs concurrently.

Temporary changes do not affect our first surrogate measure of take as temporary use would not result in a net increase in the amount of permanent roads or a net decrease in secure habitat post-project. Further, in many cases, temporary roads have different effects on grizzly bears than

those associated with permanent roads. Thus, motorized access would return to the pre-project levels, lessening the effects on grizzly bears over time.

Based on the Forest's analysis of temporary roads, the effects of temporary project roads and temporary use of restricted roads would most likely not be separate or distinguishable from the effects of the existing motorized access conditions already occurring. However, secure core and secure habitat from some site-specific projects may be impacted.

Therefore, the estimated amounts of temporary road construction and/or restricted road use that affects OMARD, TMARD, and/or secure core in the recovery zone or secure habitat outside the recovery zone represents our **second surrogate measure of incidental take of grizzly bears** that we anticipate in regards to motorized access. If projects within the recovery zone: temporarily result in more than 19 percent OMARD, 19 percent TMARD, and/or less than 68 percent secure core **and** temporarily increase OMARD by more than 5 percent, temporarily increase TMARD by more than 3 percent, or temporarily decrease secure core by more than 2 percent using a 10-year running average; result in administrative use on roads with public restrictions exceeding either 6 trips (3 round trips) per week or 1 thirty-day unlimited use period during the non-denning season; exceed 5 years; and/or access conditions (i.e., OMARD, TMARD, secure core) are not restored to pre-project conditions within 1 year of project completion then the level of incidental take we anticipate in our second surrogate measure of take would be exceeded and therefore the level of take exempted would be exceeded. Further, if more than 7 percent of the secure habitat is affected in any individual GBAU at any given time as a result of temporary road construction and use and/or temporary use of restricted roads then the level of incidental take we anticipate in our second surrogate measure of take would be exceeded and therefore the level of take exempted would be exceeded. Tracking of temporary road construction and use and temporary use of restricted roads would begin when the 2021 Forest Plan becomes effective.

Winter motorized

The Service anticipates that winter motorized use (snowmobile or over-the-snow) that may occur under the 2021 Forest Plan may incidentally result in some very low level of take of grizzly bears. Snowmobiling would be restricted on large proportions of denning and spring habitat on the Forest and thousands of acres of denning and spring habitat would be legally unavailable to snowmobiles in the broader area where grizzly bears may occur. Where grizzly bears and snowmobiling do generally overlap, there is still some spatial separation. However, the potential of snowmobile use impacting an individual grizzly bear's breeding, feeding, or sheltering to the extent that harm or harassment occurs cannot be eliminated. The incidental take is expected to be in the form of harm or harassment to individual female grizzly bears and/or cubs caused by premature den emergence or premature displacement from the den site area, resulting in reduced fitness of females and cubs, ultimately resulting in injury and possibly death.

This opinion documents that the best information available indicates that snowmobile impacts to emergent bears was a higher concern than impacts to denning bears (Graves and Ream 2001). The Service concludes that snowmobile-generated disturbance to grizzly bears in dens during the deep of winter is not likely to rise to the level causing significant impairment of breeding or sheltering to the point of injury or death. In spring, disturbance from snowmobiles to grizzly bears in dens may cause premature den emergence. Based on naturally earlier den emergence of male bears and females without young, their independence and mobility, the Service does not

anticipate the effects of disturbance caused by snowmobiles would result in take of male grizzly bears or female grizzly bears without cubs.

However, late season snowmobile use may cause a female grizzly bears with cubs to prematurely leave a den in the spring or cause a recently emerged female with cubs to be prematurely displaced from her den or den site, potentially resulting in decreased fitness of the adult female bear and/or decreased fitness or abandonment of her cubs. If cubs attempt to follow their mother from a den site prior to their gaining some mobility, they may suffer from decreased fitness or death.

The incidental take of female grizzly bears or their cubs may be indicated by:

- a female grizzly bear's premature den emergence (earlier than documented for this ecosystem, based on gender, age and reproductive status) following exposure to snowmobiles;
- the location of one or more cubs abandoned by their mother near or in a den in an area of snowmobile use;
- the location of one or more cubs accompanying a female prior to the normal (earlier than documented for this ecosystem) den emergence period in an area of snowmobile use; or
- a female bear that emerges in poor fitness in early spring (when other bears are in good condition) in an area of snowmobile use.

However, the Service anticipates such incidental take of grizzly bears will be difficult to detect for the following reasons:

- grizzly bears are difficult to detect in the wild;
- grizzly bears are wide-ranging and their denning habitat is remote, largely wilderness and difficult to access;
- grizzly bear den sites cannot be precisely located over large portions of the denning habitat;
- grizzly bear den sites are often not re-used, so even known den sites cannot be monitored over time for indications of early abandonment, injury or mortality;
- close monitoring of den sites may actually increase the risk of abandonment;
- the resorption of or loss of fetuses, or loss of cubs born in inaccessible underground den sites cannot be quantified; and
- decreased fitness, loss of young, and premature den emergence may all be related to a variety of other factors; establishing a causal relationship between snowmobiling and these effects would be difficult.

Discovery of an individual grizzly bear injury or mortality attributed to snowmobiling is very unlikely. The exact number of grizzly bears in the population is unknown, den site locations are generally unknown, and the exact levels, frequency, and location of snowmobile use is not known. The number of females with cubs, pregnant females, den emergence dates, and snowmobile use varies each year due to a number of factors, including snow conditions. All of these variables are difficult to monitor or census. The Service concludes that the level of take of grizzly bears that would result from snowmobile use would be very low based on the best available NCDE grizzly bear population information, the amount of protected and unprotected denning habitat available on the Forest, the characteristics of most grizzly bear den sites, expert opinion of grizzly bear researchers, and the best available information on grizzly bear denning.

As described above, in instances where incidental take is difficult to quantify, the Service uses a surrogate measure of take. The surrogate measure for the number of grizzly bears harmed and/or harassed will be quantified using acres of potential grizzly bear denning habitat open to snowmobiling beyond March 31 and the season ending dates for those areas open beyond March 31.

Snowmobile use within the recovery zone portion of the action area is prohibited after March 31 with the exception of the Copper Bowls play area where snowmobile use is allowed until May 31. Within the Copper Boles extended use area, approximately 691 acres overlap with modeled denning habitat. Within the portion of the action area outside of the recovery zone, the timeframe for winter motorized use varies. Portions of Dalton Mountain and Humbug GBAUs, in areas south of Highway 200, areas are open to snowmobiling through April 15; roughly 7,600 acres overlap modeled denning habitat. For the GBAUs across the remaining portions of the Forest, the dates during which over-snow motorized travel is authorized vary from yearlong to ending on May 15; for those areas where authorized winter motorized use that extends beyond March 31 approximately 112,535 acres overlap with modeled denning habitat. We do not expect significant effects beyond May 15 as the likelihood of overlap of snowmobiling and emerging female grizzly bears with cubs at that time would be very low. In addition, many of these same acres are relatively dry and snow can be intermittently present. Thus, not all areas legally open to over-snow motorized travel are actually available during the entire time they are open.

Thus, in total, approximately 120,826 acres of modeled denning habitat overlap authorized late season snowmobiling beyond March 31. The potential for significant effects would be related to the authorized late-season snowmobile closure dates of May 31 for the Copper Bowls extended use area within the recovery zone and April 15 to May 15 for the portion of the action area outside of the recovery zone. These acres of denning habitat and late season closure dates represent the **third surrogate measure of the incidental take of grizzly bears that we anticipate** as a result of the 2021 Forest Plan.

If the amount of modeled denning habitat open to authorized snowmobiling after March 31 exceeds the acres provided, or if authorized snowmobiling continues beyond the closure dates provided in the third surrogate measure, then the level of incidental take we anticipated in this revised biological opinion would be exceeded and therefore the level of take exempted would be exceeded.

We do not anticipate that motorized access in all portions of the action area would result in incidental take as some areas within a GBAU may have relatively high amounts of secure habitat. We anticipate that the likelihood of incidental take of females would be highest in those GBAUs with lower amounts of secure habitat, if females occupy them. We also do not anticipate that all temporary roads constructed and used or temporary use of restricted roads in the action area would result in incidental take. This would depend on such things as grizzly bear us of an action area, location and length of the temporary road, and the duration it would be on the landscape, as well as the potential for female grizzly bear occurrence.

In summary, over the life of the 2021 Forest Plan, if: (1) permanent increases in the existing motorized access conditions occur over the amounts displayed in our first surrogate measure of take above and are not associated with a mapping or calculation error; (2) projects within the recovery zone result in temporary increases in OMARD by more than 5 percent, temporary

increases in TMARD by more than 3 percent, or temporary decreases in secure core by more than 2 percent and result in a subunit having more than 19 percent OMARD, 19 percent TMARD, and/or less than 68 percent secure core; result in administrative use on roads with public restrictions exceeding either 6 trips (3 round trips) per week or 1 thirty-day unlimited use period during the non-denning season; exceed 5 years; and/or access conditions (i.e., OMARD, TMARD, secure core) are not restored to pre-project conditions within 1 year of project completion; (3) temporary road construction and use and/or temporary restricted road use outside of the recovery zone impacts more than 7 percent of secure habitat in an individual GBAU at any given time; or (4) authorized late season winter motorized use overlaps more than 120,826 acres of modeled denning habitat or authorized use occurs beyond the closure dates provided above, then the level of incidental take we anticipate associated with motorized access would be exceeded and therefore the level of take exempted would be exceeded. Under CFR 402.16 (1), in any of these scenarios, reinitiation of consultation would be required unless the effects of such impacts are analyzed under a site-specific consultation.

Livestock Grazing

Effects of livestock grazing on grizzly bears are generally related to depredations of livestock by grizzly bears, disposal of livestock carcasses, storage of human food and stock feed, and grizzly bear habituation, food conditioning, and mortality risk associated with these activities. Depredating bears may become food conditioned resulting in management actions that remove bears from the population. Although grizzly bear conflicts with cattle do exist, the more significant problems have been with sheep (Orme and Williams 1986).

The risk of adverse impacts to grizzly bears do exist associated with livestock grazing under the 2021 Forest Plan. Livestock grazing, especially sheep, will pose more risk as grizzly bear numbers increase in the action area, or if the number of sheep increase. Livestock depredation by grizzly bears may indirectly result in incidental take of grizzly bears by modifying natural feeding behavior to the point where management removal of the grizzly bear is needed. Based on recent trends in grazing, we assume the number of sheep allotments will not increase substantively within the action area. Of most concern are the allotments that become attractants for grizzly bears living both in and outside the recovery zone, and result in grizzly bear mortality sinks.

The 2021 Forest Plan provides management direction that would incorporate requirements into new or reauthorized grazing permits that reduce the risk of grizzly bear-human conflict and require reporting of livestock carcasses within 24 hours of discovery within the recovery zone and NCDE zone 1, prohibit increases in the number of sheep allotments or permitted animal unit months above the baseline within the recovery zone and NCDE zone 1, reduce the number of sheep allotments when opportunities arise in the recovery zone, limit potential conflict associated with weed control via small livestock within the recovery zone and NCDE zone 1, and prohibit increases in the number of active cattle grazing allotments in the recovery zone. These standards and guideline do not apply to the portions of the action area within NCDE zones 2 and 3.

No documented grizzly bear mortalities associated with livestock have occurred within the action area. Based on the information for livestock grazing in the action area (the small number of sheep allotments, the standards within the recovery zone and NCDE zone 1, and the history of no grizzly bear mortalities associated with livestock), the likelihood of incidental take of grizzly

bears associated with livestock grazing in the action area during the life of the 2021 Forest Plan is very low. However, due to the long duration of the 2021 Forest Plan, the number of grizzly bears using the action area is expected to increase and livestock grazing will remain a potential risk. Therefore, it is possible that management actions against grizzly bears related to livestock grazing may be required and thus, the potential for incidental take cannot be completely ruled out.

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 behavior that may in some cases ultimately lead to management removal or death of grizzly bears.

Specifically, the Service believes this level of take in the form of harm is proportional to the management actions taken when the permitted grazing or associated activities are reasonably believed to have contributed to the injury or death of the grizzly bear (e.g., direct connection to grazing, such as the management of bear depredating livestock, or indirect connection to grazing, such as a bear illegally killed while feeding on a livestock carcass, etc.).

Based on this information, we anticipate that **no more than one grizzly bear will be removed from the action area** over any given 10-year period over the life of the 2021 Forest Plan for management purposes related to livestock grazing. This represents our **fourth surrogate measure for incidental take of grizzly bears** in the form of harm through habituation and/or modification of natural feeding behavior. Tracking of incidental take associated with livestock grazing would begin when the 2021 Forest Plan becomes effective and would then be tracked on a sliding scale (ex. 2020-2029, 2021-2030, 2022-2031, and so on).

Therefore, should more than one grizzly bear be removed from the action area during any given 10-year period over the life of the 2021 Forest Plan related to livestock grazing, then the level of incidental take we anticipate 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. Additionally, should the level of incidental take associated with livestock grazing reach, but not exceed, the anticipated incidental take level, the Forest should informally consult with the Service regarding the adequacy of existing mechanisms to minimize potential take.

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 NCDE grizzly bear population, incidental take of grizzly bears in the action area would not affect the recovery of the

NCDE grizzly bear population. The 2021 Forest Plan implements several measures that would sufficiently minimize impacts to grizzly bears.

Canada Lynx

Amount or Extent of Take Anticipated

We anticipate that most of the incidental take associated with implementation of the 2021 Forest 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 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 revised biological opinion, snowshoe hare habitat quality may be temporarily degraded on up to 49,823 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 2021 Forest Plan would be minimized in several ways. The NRLMD will be incorporated into the 2021 Forest Plan. By following and incorporating the NRLMD, the 2021 Forest 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 49,823 acres of snowshoe hare habitat within occupied lynx habitat over the life of the 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 2021 Forest 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 49,823 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 2021 Forest 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 49,823 acres of snowshoe hare habitat within occupied lynx habitat are treated over the life of the 2021 Forest Plan using the exemptions from and exceptions to the NRLMD vegetation standards, then the level of incidental take we anticipated in this revised 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.

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 at least 94 percent of occupied lynx habitat on the Forest, which 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.

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 2021 Forest Plan reduces the potential for and minimizes the effect of incidental take of both grizzly bears and Canada lynx. By managing for grizzly bears within the NCDE recovery zone and NCDE zone 1 (following the NCDE conservation strategy), the amount of incidental take of grizzly bears will be limited. By following the NRLMD, the 2021 Forest Plan will also reduce the potential for incidental take of Canada lynx. The following reasonable and prudent measures are appropriate to further minimize the impacts of incidental take of grizzly bears. As the Forest has incorporated the Service's previous terms and conditions associated with the NRLMD into the NRLMD, and thus the 2021 Forest Plan, no additional reasonable and prudent measures are necessary to minimize the impacts of incidental take of Canada lynx.

Grizzly Bears

1. Reduce the potential for displacement of grizzly bears related to motorized access.

2. The Forest Service shall minimize the potential for harm of 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:

Grizzly Bears

To implement Reasonable and Prudent Measure #1:

1. When implementing road restrictions to restrict motorized access, the Forest shall use devices or methods recognized by the IGBC as effective closure devices and methods (IGBC 1998).

2. The Forest shall update the motorized access data within the GBAUs outside of the recovery zones, including secure habitat, as they obtain new information and/or develop site-specific projects.

To implement Reasonable and Prudent Measure #2:

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

Reporting requirements

To demonstrate that the 2021 Forest 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 both grizzly bears and Canada lynx and submit it to the Service's Montana Field Office biennially by May 1 for the preceding two calendar years for the life of the 2021 Forest Plan. The report shall include:

Grizzly Bears

1. In relation to the first and second surrogate measures of incidental take of grizzly bears and term and condition 2, provide an up-to-date record of the existing, ongoing access conditions including OMARD, TMARD, and secure core for the subunits within the recovery zone and secure habitat for the GBAUs outside of the recovery zone. Provide rationale for any changes that occur from the metrics displayed in the first and second surrogate measures of incidental take. In addition, report the existing conditions along with any updates to the baseline at the time of site-specific section 7 project consultations.

2. In relation to the third surrogate measure of incidental take of grizzly bears, provide an up-to-date record of the amount of OMARD, TMARD, and secure core affected by temporary projects within the recovery zone; and the percent of secure habitat affected from new temporary road construction and use or temporary restricted road use within GBAUs.

3. In relation to the fourth surrogate measure of incidental take of grizzly bears, provide an up-to-date record of any changes in the amount of modeled grizzly bear denning habitat that overlaps authorized late season over-the-snow use and any authorized changes in the snowmobile closure dates.

4. In relation to the fifth surrogate measure of incidental take of grizzly bears, an up-to-date record of grizzly bear/livestock conflicts and management removals of grizzly bears related to livestock grazing in the action area. The Forest shall notify the Service's Montana Field Office within 72 hours of notification of any livestock depredation by grizzly bears. The Forest shall notify the Service's Montana Field Office if a change in the status of sheep grazing in the action area is being considered.

5. To gauge the validity of our assumptions that (1) illegal motorized access would most likely result in temporary effects to grizzly bears and (2) when illegal motorized access is observed or when user-created roads become apparent the Forest corrects the situation as soon as they are able, provide an up-to-date record of known illegal motorized access that occurred during the preceding two calendar years and how the Forest responded. Include information such as (but not limited to): the location of illegal motorized access, the type of barrier breached, how the barrier was breached, the date the Forest became aware of the illegal motorized access, how the Forest responded to the illegal motorized access, and the date the Forest carried out its response.

Canada Lynx

6. 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.

7. 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.

8. Reporting requirements 6 and 7 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.

Closing Statement

The Service is unable to precisely quantify the number of grizzly bears and Canada lynx that will be incidentally taken as a result of the 2021 Forest Plan. Therefore, we use surrogate measures for the amount of incidental take we anticipate. We use the existing levels of access management as well as temporary road construction and use and temporary use of restricted roads as our first and second surrogate measures of incidental take of grizzly bears related to motorized access management. We use the amount of grizzly bear denning habitat that overlaps winter motorized use, as well as winter motorized use closure dates, as our third surrogate measure of incidental take of grizzly bears. In our fourth surrogate measure of incidental take of grizzly bears, we anticipate that no more than one grizzly bear will be removed from the action area related to livestock grazing during any given 10-year period. 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.

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. 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.

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. Continue to manage access on the Forest to achieve lower road densities. By managing motorized access, several grizzly bear management objectives could be met including: (1) minimizing human interaction and potential grizzly bear mortality; (2) minimizing displacement from important habitats; (3) minimizing habituation to humans; and (4) providing relatively secure habitat where energetic requirements can be met (Interagency Grizzly Bear Committee 1998). Additionally, lower road densities would also benefit other wildlife and public resources.

2. Motorized access management is only one of several factors influencing grizzly bear habitat and grizzly bear security. The presence of attractants is a major factor leading to the food conditioning and habituation, and the eventual direct mortality or management removal of grizzly bears. The Service supports the Forest's continued efforts to manage food storage. Management of garbage, food and livestock feed storage, to prevent access to bears, benefits grizzly bears as well as black bears and other carnivores. Human/carnivore interactions would also be reduced, leading to a public safety benefit.

3. Grizzly bears concentrate in certain areas during specific time periods to take advantage of concentrated food sources or because the area provides a high seasonal food value due to diversity in vegetation and plant phenology (e.g., important spring for fall range). Where grizzly bear use is known or likely to occur and where practicable, delay disturbing activities during the spring in spring habitats to minimize displacement of grizzly bears.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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 of 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).

REINITIATION NOTICE

This concludes consultation on the effects of the 2021 Forest Plan on grizzly bears, 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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