



United States Department of the Interior

Fish and Wildlife Service

Montana Ecological Services Office

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In Reply refer to:

File: M19 Flathead National Forest

06E11000-2019-F-0649 Hellroaring Basin Improvement Project

September 27, 2019

Chip Weber, Forest Supervisor
Flathead National Forest
650 Wolfpack Way
Kalispell, Montana 59901

Dear Mr. Weber:

Thank you for your letter of May 13, 2019, requesting U.S. Fish and Wildlife Service (Service) review and consultation on the proposed Hellroaring Basin Improvement Project (project).

The project was analyzed for effects on federally listed threatened and endangered species: specifically bull trout (*Salvelinus confluentus*), designated bull trout critical habitat, Canada lynx (*Lynx canadensis*), designated Canada lynx critical habitat, and grizzly bear (*Ursus arctos horribilis*). The Forest determined that the proposed project *may affect, and is likely to adversely affect* grizzly bear, Canada lynx, and designated Canada lynx critical habitat. The Forest also determined that the proposed project *may affect, but is not likely to adversely affect* bull trout and will have *no effect* to designated bull trout critical habitat.

The project area is located on the Tally Lake and Glacier View Ranger Districts of the Flathead National Forest, and would include a suite of activities within the existing permit boundary for Whitefish Mountain Resort. The proposed action involves development of ski runs and associated infrastructure in the upper elevations of the Hellroaring Basin, and abandonment of lower elevation ski runs Hellroaring Basin. The biological assessments (BAs) for aquatic and terrestrial resources provide a thorough project description, including a number of design features the Forest has included to reduce the effects on listed species.

Bull Trout and Designated Bull Trout Critical Habitat

The majority of activities in the proposed action would occur in Hellroaring Basin, which is drained by Hellroaring Creek. There are no fish in Hellroaring Creek, which drains into

Whitefish Lake. Whitefish Lake does support a depressed population of bull trout, however, sediment generated from this project is not modelled to reach the lake, and thus and will not affect bull trout in Whitefish Lake. No other effects to bull trout are expected from activities in Hellroaring Creek.

Construction of the uppermost part of Chair 12, the cat track, and the proposed service road to the top of Chair 12 were considered with regards to effects to bull trout and habitat in Big Creek watershed, which is a bull trout watershed. Sediment created from the construction of the upper Chair 12 terminal is not expected to be routed to any streams, as there are no streams within one quarter mile of the peak. The potential service road to the top of Chair 12 on the Big Creek side of the Whitefish Range is spatially removed from bull trout waters, does not contain any known stream crossings, would not generate measurable volumes of sediment to the system, and would not create measurable changes to hydrologic processes beyond the site scale. The cat track that will connect Hellroaring Basin to the north side of the ski area will not contribute sediment to streams.

Due to unlikelihood of bull trout occurring in any streams during the project-related activities, and the predicted undetectable amount of sediment that would be delivered to Big Creek, the effects are expected to be insignificant to Big Creek. Thus, we concur with the Forest's assessment that the Hellroaring Basin Improvement Project *may affect, but is not likely to adversely affect* bull trout.

Grizzly Bear and Canada Lynx

The Forest also concluded that the project *may affect, and is likely to adversely affect* grizzly bear, Canada lynx, and designated critical habitat for Canada lynx. The attached biological opinion is based on information provided in the biological assessments prepared by Amy Jacobs, Wildlife Biologist, and Pat Van Eimeren, Fisheries Biologist, information gathered during the consultation process, and information contained in our files. The 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 complete project file of this consultation can be found at the Service's Montana Field Office.

Thank you for your continued assistance in the conservation and recovery of endangered, threatened, and proposed species. If you have questions or comments in the short-term related to this consultation, please contact Carly Lewis (USFWS Liaison) at cwlewis@usda.gov or (406) 329-3091. Otherwise, please coordinate with the Montana Ecological Services Office.

Sincerely,



for Jodi L. Bush
Office Supervisor

Endangered Species Act- Section 7 Consultation

**Biological Opinion
for
Effects to Canada Lynx and Grizzly Bear
from the
Hellroaring Basin Improvement Project
Flathead National Forest
2019**

U.S. Fish and Wildlife Service Reference:

06E11000-2019-F-0649 Hellroaring Basin Improvement Project

Action Agency:

U.S. Forest Service, Flathead National Forest, Tally Lake and Glacier View Ranger Districts

Consultation Conducted By:

U.S. Fish and Wildlife Service, Montana Ecological Services Office

Date Issued:

September 27, 2019

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I. INTRODUCTION & CONSULTATION HISTORY

Section 7(b)(3)(A) of the Act requires that the Secretary issue biological opinions on Federal agency actions that “may affect” listed species or critical habitat. Biological opinions determine if the action proposed by the action agency is likely to jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. Section 7(b)(3)(A) of the Act also requires the Secretary to suggest reasonable and prudent alternatives to any action that is found likely to jeopardize the continued existence of listed species or result in an adverse modification of 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 biological opinion was prepared by the U.S. Fish and Wildlife Service (Service) and analyzes the effects of Hellroaring Basin Improvement Project (project) on Canada lynx (*Lynx canadensis*) and grizzly bears (*Ursus arctos horribilis*). This biological opinion addresses only impacts to federally listed species and does not address the overall environmental acceptability of the proposed action. Formal consultation was initiated on May 14, 2019, the date the Service received the biological assessment (U.S. Forest Service 2019) for the proposed action. The biological assessment, information in our files, as well as additional information received and discussions throughout the informal and formal consultation process were used in the preparation of this biological opinion. A complete project file of this consultation is on file at our office.

In 2017 the Flathead National Forest consulted with the U.S. Fish and Wildlife Service regarding the proposed (now implemented) Flathead National Forest Land Management Plan (hereafter Forest Plan); USFS 2018). Consultation on the overarching plan represented to first tier of a tiered consultation framework, and specified that each subsequent project that may affect grizzly bears, lynx or lynx critical habitat as implemented under the Revised Forest Plan being the second tier of consultation (USFWS 2017). These second tier consultations would undergo detailed, site-specific analysis for effects on listed species, and would reference back to the 2017 Forest Plan biological opinion to ensure that the effects of specific projects under consultation are commensurate with the effects anticipated in the first tier biological opinion. This biological opinion for the Hellroaring Basin Improvement Project is a second tier consultation.

The Service has consulted with the Forest regarding the Whitefish Mountain Resorts special use permit (formerly named Big Mountain) on multiple occasions over the past several decades. The USFWS issued biological opinions for expansion projects (USFWS 2015, 2013, 2012, 2011, 2007, 1995). The history of those consultations, as well as previous conservation recommendations and incidental take were considered as part of the baseline for this consultation.

In addition, the action area for the Hellroaring Basin Improvement Project overlaps with the action area for a recent project that the Flathead NF proposed and consulted on with the US Fish and Wildlife Service, the Taylor Hellroaring Project. The biological opinion for the Taylor Hellroaring project (USFWS 2018) concluded that although there would be adverse effects to

grizzly bears, Canada lynx, and lynx critical habitat, the project is not likely to jeopardize the continued existence of grizzly bears and Canada lynx, and is not likely to destroy or adversely modify Canada lynx critical habitat. Letters exchanged between Flathead NF and the Service on March 13 and August 6, 2019, confirmed that the analysis in the 2018 biological opinion for Taylor Hellroaring were unchanged, and that the adverse effects to grizzly bears, lynx, and lynx critical habitat were all adequately analyzed in the 2017 Revised Forest Plan biological opinion and 2018 revised Incidental Take Statement. The proposed action that underwent consultation for Taylor Hellroaring is considered part of the baseline for consultation on the Hellroaring Basin Improvement Project.

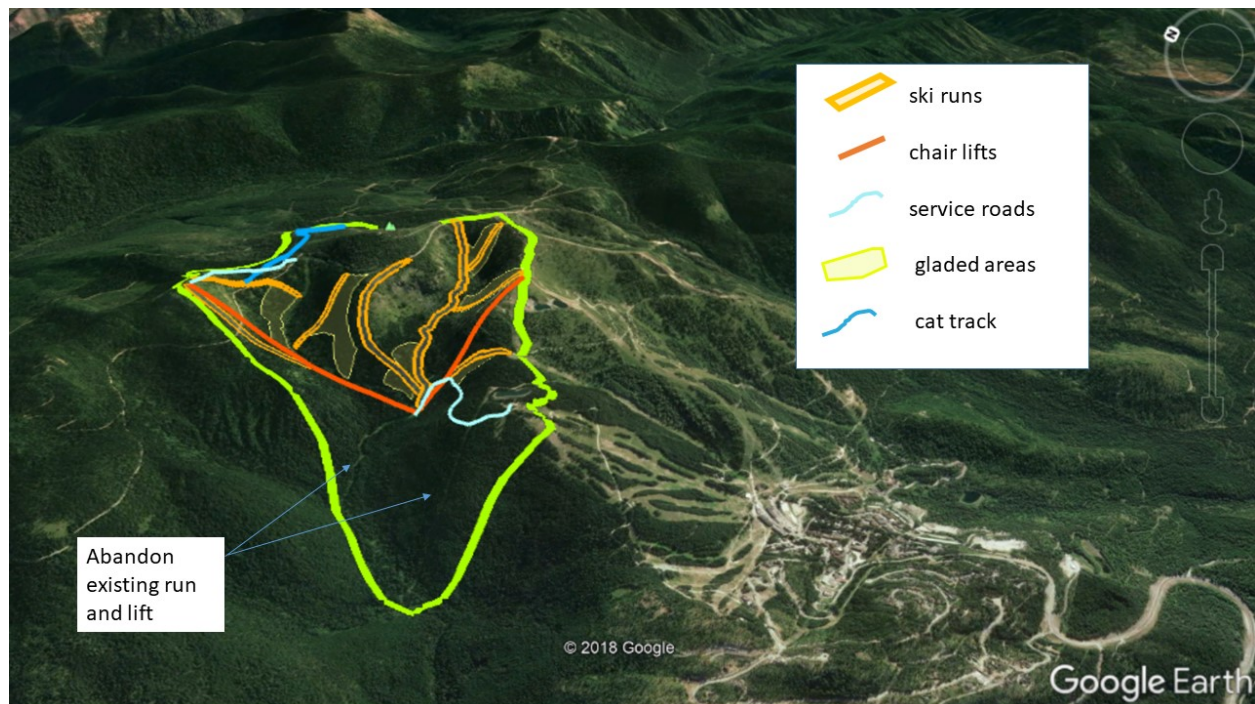
II. DESCRIPTION OF PROPOSED ACTION

A. Proposed Activities

The Flathead National Forest proposes to allow expansion of the Whitefish Mountain Resort (WMR) within the bounds of the existing permit area. In particular, the proposed action would allow for development into the upper elevations of Hellroaring Basin, located to the west of the main developed portion of the permit area. In particular, the proposed Hellroaring Basin Improvements Project includes the following:

- Eight new ski runs from the upper edges of Hellroaring Basin down to the Grand Junction area.
- Selective tree removal in seven gladed areas adjacent to proposed ski runs, as well as selective tree removal for scenery concerns in four areas.
- Four terrain modifications in/adjacent to Hell Fire Run and Swift Creek Run.
- Relocation of Chair 8 and corresponding abandonment of the existing Chair 8/Purgatory Run;
- Installation of a new chairlift to Hellroaring Peak (Chair 12);
- Tree felling to create a cat track (ski way) that would provide access from the ridge above Hellroaring Basin to Gray Wolf Run on the north side of the Resort;
- Construction of two service roads (to Grand Junction and Hellroaring Peak), including one bridge over Hellroaring Creek;
- Abandonment of the existing Hell Fire Run below Grand Junction and rehabilitation of up to four creek crossings in this area;
- Avalanche control on the upper slope of Hellroaring Peak; and
- An update to the existing special order that currently restricts use of bicycles to certain roads and trails and prohibits discharge of firearms on the front side of the Resort so that it includes the project area.

Figure 1. Map of proposed development of the Hellroaring Basin project area (outlined in bright green).



B. Conservation Measures

The biological assessment for the project specifies numerous design features that are intended to minimize the effects to lynx and grizzly bears. In Appendix C of the biological assessment, the Forest details those design features in Table D. The Service considers these design features to be part of the proposed action, and has assessed the project effects given these conservation measures. In particular, the following conservation measures were specifically considered as part of the proposed action as described in the Biological Assessment:

- Proposed action activities would be completed between June 1 and November 30 each year to limit impacts to wildlife and to minimize ground disturbance during wet time periods in the springtime. Project implementation would not exceed 5 years.
- Helicopter flights for chairlift installation would be limited to five days for construction of each chairlift to minimize disturbance to wildlife. Additional days may be approved in writing by the Forest in extenuating circumstances.
- No helicopter flights or landings would be allowed on the north side of the Whitefish Range divide nor to the west or northwest of the Hellroaring drainage, unless needed for safety or emergency situations.

- All maintenance activities in the Hellroaring drainage, with or without heavy machinery, would be limited to a single three-week maintenance period each year between July 1 and November 30, unless an exemption is approved in writing by the Forest. This maintenance activity restriction would not include items such as routine inspections, monitoring, assessments, visual checks, or addressing minor safety items.
- To minimize disturbance to wildlife security habitat, public motorized use of the Grand Junction and Hellroaring Peak service roads would not be allowed. The roads would be gated and signed.
- To minimize disturbance to wildlife security habitat, bicycle use would also be prohibited on the service roads to minimize impacts to wildlife. The existing special order that restricts bicycle use to designated routes on the front side of the Resort would be updated to include Hellroaring Basin. To encourage compliance with this, signage would be posted and a gate would be put in place at the beginnings of the roads.
- Public motorized use of the cat track would be prohibited year-round to protect wildlife security habitat. Although public use in summer is unlikely due to the steep grade and vegetation left in the cat track and the dense vegetation of the surrounding area. Education, such as signage, would also be used to discourage off-highway vehicle, bicycle, and hiker use.
- To maintain wildlife habitat security, trees and slash would be felled into the cat track, as much as possible. However, trees and slash left in the cat track would not be left in a manner that would cause a safety hazard during winter use.
- In order to protect non-denning grizzly bear habitat security, Hellroaring Basin would continue to be subject to the skier use closure that begins annually on April 1.
- In order to reduce wildlife impacts, spring, summer, and fall recreation in the Hellroaring Basin, excluding the Road 9790 and the proposed Taylor Hellroaring Project trails, would not be promoted by the Resort.
- All individuals involved with implementation of this project would be required to comply with the Forest's food storage and sanitation order(s).
- Hunting and transportation of hunters and game by individuals involved in the implementation of this project would be prohibited.
- In order to reduce the risk of grizzly bear-human conflicts (FW-GDL-REC-01, p. 61): All individuals involved with implementation of this project would be

informed of procedures for safely working and recreating in grizzly bear country and of food/wildlife attractant storage special order(s) prior to beginning work and annually thereafter; and

- Overnight camping on Forest Service lands by individuals involved in the implementation of this project would require written approval from the Forest Service on a case by case basis.
- In order to resolve a grizzly bear-human conflict situation, project activities would be modified, cancelled, suspended, or temporarily ceased, as needed.
- If any of the following are found within or close to any authorized activity, operations within that immediate area will cease until a Forest Service wildlife biologist is notified and, if necessary, activities are modified: Active denning sites used by grizzly bears, wolves, lynx, fishers, or wolverines

C. Term of the Proposed Action

The effects of the Hellroaring Basin Improvements Project on lynx and grizzly bears were considered to continue indefinitely based on the planned continuance of recreation activities and maintenance of vegetation removal.

III. BIOLOGICAL OPINION FOR GRIZZLY BEARS

A. Status of Species and Critical Habitat

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 Review (U.S. Fish and Wildlife Service 2011), the grizzly bear recovery program 2018 annual report (U.S. Fish and Wildlife Service 2019), the NCDE Grizzly Bear conservation strategy (U.S. Fish and Wildlife Service et al. 2019), Grizzly bear demographics in the NCDE (Costello et al. 2016), NCDE grizzly bear population monitoring team annual report 2018 (Costello and Roberts 2019), the Greater Yellowstone Ecosystem conservation strategy (U.S. Fish and Wildlife Service 2016), the Yellowstone Grizzly Bear Investigations 2017 (van Manen et al. 2018), the Cabinet-Yaak Grizzly Bear Recovery Area 2017 Research and Monitoring Progress Report (Kasworm et al. 2018a), 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 2017 Research and Monitoring Progress Report (Kasworm et al. 2018b). These documents (referenced here), include the best available science regarding the status and distribution of grizzly bears and are incorporated by reference.

The proposed action is within the North Continental Divide Ecosystem (NCDE). All status evidence indicates the strength of this population, including current distribution of grizzly bears within and outside the recovery zone, a total population estimate of 1,029 grizzly bears in the NCDE for the year 2017 (USFWS 2018) and the positive rate of growth rate (Costello et al. 2016). The recent decrease in genetic differentiation and the expanded distribution of grizzly bears in the NCDE are consistent with population growth (Kendall et al. 2009). The number and wide distribution of female grizzly bears detected during the study (*Ibid.*), along with reported numbers and locations of recent sightings and conflicts, (Costello et al. 2016), also suggest an increasing number of grizzly bears in the NCDE. In addition, the NCDE grizzly bear population is contiguous with grizzly bears in Canada, which results in high genetic diversity (Proctor et al. 2012). Based on the best available information, the Service concludes that the status of the NCDE grizzly bear population is either nearing recovery or has already achieved it.

Previous Consultations and Conservation Efforts

The NCDE Grizzly Bear Conservation Strategy (NCDE Subcommittee 2019) is the post-delisting management strategy for the NCDE grizzly bear population and its habitat. The NCDE Grizzly Bear Conservation Strategy contains habitat-related management direction that pertains to the portions of the Flathead, Helena-Lewis and Clark, Kootenai, and Lolo National Forests that are located within the NCDE.

The Flathead National Forest Revised Plan incorporates key management direction for grizzly bear habitat consistent with what was developed in the NCDE Conservation Strategy into forest plan components (i.e., desired conditions, standards, guidelines, monitoring). As stated above, formal consultation on the Revised Plan was conducted by the USFWS in 2017, and a revised Incidental Take Statement was issued in 2018. The biological assessment for the Hellroaring Basin Improvement Project (USFS 2019, Appendix 7) provides details of how the project is

consistent with grizzly bear direction in the Forest Plan, and thus how it meets the intent of the NCDE Conservation Strategy. This biological opinion assesses the particular aspects of the implementation of this project within the context of the Conservation Strategy and Forest Plan.

B. Environmental Baseline

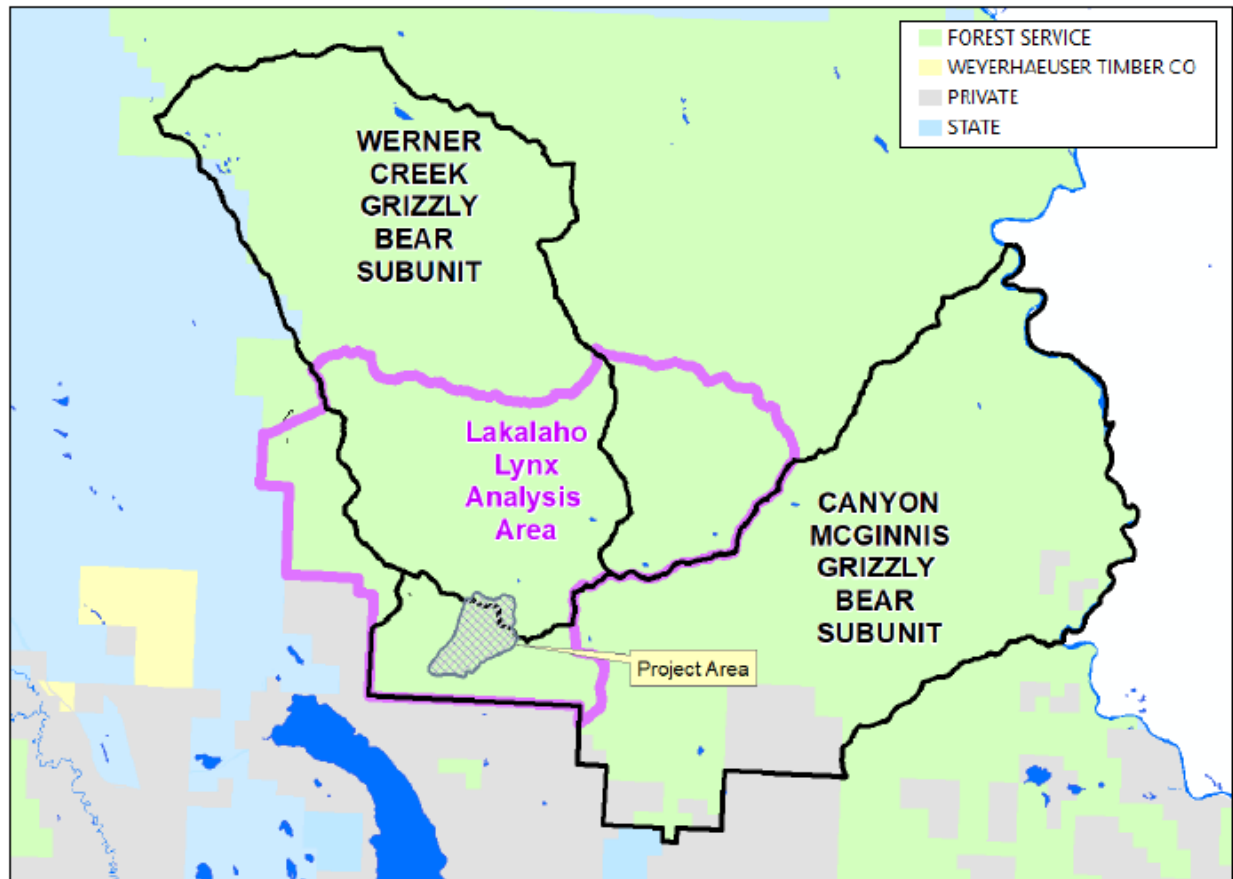
“Environmental baseline” refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of 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 process. 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.” [50 CFR 402.02 (2019)].

Action Area

The “action area” includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action [50 CFR §402.02]. The action area does not necessarily include all areas potentially frequented by far-ranging, or migrant, species (USFWS and NMFS 1998).

The Canyon McGinnis and Werner Creek Grizzly Bear subunits were used to analyze direct, indirect, and cumulative effects to the grizzly bear and have been determined as the appropriate scale to analyze effects to grizzly bears by the Interagency Grizzly Bear Committee (IGBC).

Figure 2. Location of the Hellroaring Basin Improvement Project area in relation to the Werner and Canyon McGinnis grizzly bear subunits (action area for grizzly analysis) and the Lakalaho LAU (action area for lynx analysis).



Status of the Species within the Action Area

Grizzly bears and their sign have been recorded in the Werner and Canyon McGinnis subunits for many years. In the past 20 years, there have been four documented grizzly bear mortalities in the project subunits, not including dependent young. Three of these occurred in the Canyon McGinnis subunit, with only one occurring on NFS lands. This female had been killed by gunshot and was found along an NFS road. The three yearling cubs found near the carcass appeared to be fine. The other two mortalities occurred on private land. The remaining mortality occurred in the Werner Creek subunit on NFS lands. This adult male mortality was also the result of a gunshot wound.

Within the Hellroaring Basin project area itself, grizzly use has been observed in and near the project area, and tracks, scat, and a den site were encountered during field surveys (USFS 2019). NCDE Monitoring data confirm year-round use of the project area by both male and female grizzly bears, including females with cubs and a denning female.

The Hellroaring Basin area has long been recognized as providing high quality habitat for grizzly bears. In 1984, the Service expressed concerns about development in the Hellroaring drainage

because of the potential loss of quality spring grizzly bear habitat. The 1995 Big Mountain Expansion biological opinion (USFWS 1995) also stressed the importance of Hellroaring Basin to bears. Because little other unroaded habitat exists in the southern end of the Whitefish Range, this drainage has added value as security habitat (not Secure Core).

Factors Affecting Species Environment within the Action Area

The subunits, which are over 90% Forest land, provide potential habitat for grizzly bears year-round. The area supports over 20,000 acres of modeled grizzly bear denning habitat and nearly 40,000 acres of hiding cover, and both are well distributed (USFS 2019). Denning season in this area is considered to be from December 1 to March 31 each year. The Forest characterized denning habitat by looking at combinations of elevation, aspect, slope, and vegetation that matched known grizzly bear dens. Spring (April 1 to June 30) is a key time for grizzlies because they emerge from their winter dens, possibly with young cubs or yearlings, and move to lower elevations with a focus on greener, moister areas. Spring habitats typically emphasize avalanche slopes and other habitats supporting grasses and forbs. Mace and Manley (1993) found that grizzlies switched to berries during the middle of July and continued to feed heavily on berries through September. In summer and fall, abundant and diverse habitat is available for grizzly bears across these two subunits.

The biological opinion for the Flathead Forest Plan (USFWS 2017) gives an overview of a suite of factors affecting grizzly bears on the Flathead NF, including:

- Food & attractant storage
- Motorized routes
- Over-snow vehicles
- Non-motorized trails
- Developed recreation sites
- Livestock management
- Vegetation management
- Mineral and energy development
- Habitat fragmentation
- Climate change

Many of these factors affect grizzly bears within the Werner and Canyon McGinnis subunits. In particular, motorized access has long been recognized as a major factor affecting grizzly bears, as bears can experience increased mortality associated with open motorized routes, and exhibit avoidance of roads. In 1994, the IGBC Task force provided standardized definitions for roads and standardized methods to measure road densities and define analysis areas (IGBC 1994). A composite home range was constructed using home range data on adult female grizzly bears in the South Fork Study area (Mace and Manley 1993). This adult female grizzly bear composite home range was described in terms of open and total motorized access density and core habitat using the definitions coined by the IGBC Task force (IGBC 1994). Spatial analysis indicated that approximately 19 percent of the composite home range had an open motorized access

density exceeding 1 mile per square mile; 19 percent had a total motorized access density exceeding 2 miles per square mile; and 67.5 percent was core area.

Table 1 displays the existing conditions of open motorized access route density (OMRD), total motorized access route density (TMRD), and security core habitat in the two project subunits. Data are displayed as the percent of the subunit having greater than 1 mile per square mile OMRD, percent of the subunit having greater than 2 miles per square mile TMRD, and percent of the subunit providing grizzly bear security core habitat.

Table 1. Motorized access parameters within the action area for the Hellroaring Basin Improvement Project.

Grizzly Bear Subunit	Access Density Parameter		
	OMRD (> 1 mi/mi ²)	TMRD (> 2 mi/mi ²)	Secure Core
Canyon McGinnis	18%	31%	50%
Werner Creek	29%	20%	63%

These conditions likely continue to contribute adverse effects to individual grizzly bears since route densities are greater than those known to adversely affect grizzly bears (19% for OMRD and TMRD), or the percentage of secure core is less than the threshold also known to adversely affect grizzly bears (at least 68%). As described in the biological opinion for the Forest Plan (USFWS 2019), the Service expects these adverse effects to continue, but these conditions are consistent with conditions on the Forest during a time when the NCDE grizzly bear population was known to be increasing in size and expanding in distribution (Costello et al. 2016, Kendall et al. 2009, Mace et al. 2012).

Recreation, both developed and dispersed, also affects grizzly bears within the subunits. Hunting, firewood gathering, berry picking, hiking, mountain biking, horseback riding, driving, motorcycle/ATV riding, snowmobiling, camping, and other recreational uses are all popular within the subunits. Whitefish Mountain Resort has an array of ski runs, ski lifts, trailheads, and buildings, which includes the Summit House Restaurant and generates relatively high levels of recreational activity yearlong in the western end of the Canyon McGinnis Subunit and heavy use during the winter in the southern end of the Werner Creek Subunit. These activities can displace bears from these areas in all seasons. In addition, hiding cover in both of those areas continues to be modified by ski area maintenance. There is a State DNRC lookout cabin on Werner Peak which is accessed by the Taylor Road NFSR 9790. The Great Northern Flats and Big Creek River Accesses are on the east edge of the Canyon McGinnis subunit. Winter activities in potential denning habitat, such as ski area operation, avalanche blasting, snowmobiling, and communication tower maintenance, may have reduced denning in some parts of the analysis area.

C. Effects of the Action to Grizzly Bears

“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 CFR § 402.02 (2019).

For the Hellroaring Basin Improvement project, creating new ski runs and lifts requires a variety of activities that would affect grizzly bears. To efficiently analyze the effects of all activities for the proposed action, activities were categorized into the following Activity Categories based on the similarity or interrelationship between effects of these activities.

- Vegetation Alterations
- Implementation/Development
- Long-term Recreational Use
- Road Construction and Use
- Snow Compaction & Blasting

Effects of Vegetation Alterations

The proposed project may temporarily decrease the available forage due to ground disturbance in ski runs, lift corridors, terrain modification areas, and in gladed areas. This decrease would be temporary and we anticipate that some areas in may experience an increase in available forage following vegetation management as greater amounts of sunlight and moisture reach the forest floor. The removal of vegetation within ski runs and lift corridors would result in permanent loss of cover for grizzly bears. The design features that would maintain inter-run islands of forested vegetation would help to minimize effects to grizzly bears from loss of cover. Grizzly bears that may be foraging in the more open areas could easily access forested areas or areas where shrubs are tall and thick in ski runs to find cover when needed. The amount of forage and cover modified would be such a small amount of a grizzly bear’s home range that these effects would likely be insignificant.

Denning habitat for grizzly bears exists in the Hellroaring Basin area, particularly in the highest elevations. Grizzly bears usually dig dens on steep slopes where wind and topography cause an accumulation of deep snow and where the snow is unlikely to melt during warm periods. In addition, grizzly bears are more likely to den in areas with greater canopy cover (Pigeon et al. 2016a) and at elevations above 6,371 feet (>1,942 meters) (Mace and Waller 1997a). The removal of vegetation for ski runs and lift lines would reduce canopy cover in portions of the developed area, potentially reducing suitable denning habitat in the Hellroaring Basin area. The biological assessment reports that the amount of denning habitat available within the Werner and McGinnis subunits is abundant (over 20,000 acres; USFS 2019). Therefore, the reduction in canopy cover is expected to have insignificant effects to a grizzly bear’s ability to find suitable denning habitat within its home range.

Effects of Development and Maintenance

Heavy Equipment Use

Construction of the ski runs, gladed areas, cat track, service roads, and lift corridors would require the use of survey and work crews that would increase human activity in the area.

Disturbance to bears could also result from heavy machinery that will be used to fell and process trees, and heavy machinery that will be used to construct roads and modify terrain.

The area to be affected, while good habitat for grizzly bears, is a small area in relation to the size of a home range for a grizzly bear. This construction-related activity would occur within a five year period at most. Construction activities could begin on June 1 of each year and last thru November. The Forest and the Service considered the pros and cons of allowing construction activity to begin in June versus waiting until July each year. By allowing a longer seasonal window for construction activities to occur, there are better chances that the construction can be done in fewer seasons, meaning it should not take a full five years to complete the construction. A shorter pulse in terms of number of seasons bears could experience disturbance from construction activities in the basin would be less disruptive to bears. Additionally, by June 1, bears have been out of the den for a few months and had opportunities for foraging such that spring forage resources are less limited than earlier in the spring.

Overall, the disturbance created by ground-based construction activities could cause bears to shift their use of the Hellroaring Basin area to night-time hours, or shift their use within the basin to portions that do not have activity at the time (e.g. the lower elevations where runs are being abandoned). Because the affected area is a small portion of a bear's home range, and other non-disturbed areas will remain available in the subunits during the time of implementation of this project (even if it coincides with implementation of the Taylor Hellroaring project), we expect the effects to individual bears to be insignificant.

Once the initial construction is complete, annual maintenance will occur within the Hellroaring Basin ski runs, gladed areas, lift corridors, and any other areas necessary. This maintenance could utilize heavy machinery, as well as hand-held equipment such as chainsaws, weed eaters, and other equipment. This noise, and the presence of humans, would create a short 3-week pulse of disturbance within the area. Because this would be a short pulse, and would occur within a small portion of a bear's home range, with other non-disturbed areas available for use, the effects are expected to be insignificant to grizzly bears.

Helicopter Use

Construction will also require the use of helicopters to transport materials into the Hellroaring Basin for construction of ski lifts. The existing lift in the lower part of the Basin will be moved to its new location in the upper part of the Basin, and additional lift supports will be brought in for the second lift. When aircraft are used at low altitudes (<500 meters AGL), bears become aware of the aircraft, may flee to cover, or may move away from an area (Anderson et al., 2009). Helicopter use will consist of multiple trips per day, for up to five days per ski lift (total of 10 days). Flight paths will not occur in or over any Secure Core, but they will occur in an area where bears generally do not receive much disturbance, as much of the Hellroaring Basin currently offers dense, steep, unroaded habitat. Thus, any bears that are within the flight path could experience disturbance that could cause a pulse of stress, affect behavior, or affect use of available resources during the pulse of activity.

In 2009, a team of Service and U.S. Forest Service Biologists reviewed the scientific literature regarding the effects of helicopters and other aircraft on grizzly bears, and developed

recommendations for project effects analysis (Anderson et al. 2009). That paper and the literature within are hereby incorporated by reference. Some of the key points include:

- The Interagency Grizzly Bear Committee (1987) summarized numerous studies that have documented a wide variety of reactions by grizzly bears to aircraft disturbance due to factors such as the degree of habituation to aircraft, availability of cover, altitude, noise level and behavior of the aircraft. Individual bears may demonstrate different tolerances to helicopter disturbance. Overall, grizzly bears may be more sensitive to helicopter disturbance than to fixed-wing aircraft.
- Bear responses may range from: (1) slight loss of habitat due to avoidance or displacement; (2) disturbance of bears during denning, causing abandonment of dens (not an issue in the Hellroaring Basin Improvement project); and (3) physiological or behavioral stress (Harding and Nagy 1980; Reynolds, et al. 1986). Many of the studies occurred in more open country than normally found in northwest Montana and Northern Idaho, which could elicit different responses from bears or actually prevent a response from being noticed due to forested cover.
- McLellan and Shackleton (1989a) observed bears responded more strongly to fixed-wing aircraft when it was less than 150 meters away. In timbered habitats, McLellan and Shackleton (1989b) found that an overt avoidance or displacement response required high intensity helicopter activity, such as carrying equipment within 200 meters of a grizzly bear. Reynolds et al. (1986) detected increased heart rates in grizzly bears when fixed-wing aircraft were within 100 meters above ground level (AGL) after den emergence.

In summary, the available evidence suggests that aircraft flying at relatively low altitudes in occupied habitat can elicit a response by grizzly bears. Effects may range from a simple awareness of the aircraft (i.e., raising the head but otherwise continuing uninhibited) to short-term disturbance or flight response (resulting in physiological changes such as increased stress and energetic demands) to temporary displacement from an area. In terms of effects determinations for section 7 consultation purposes, the team's consensus was that if the duration of the low altitude helicopter use is extended (occurs over a 48-hour period), and the effects are not relaxed (multiple trips, passes, or sweeps each day), then the operation is generally "likely to adversely affect" grizzly bears.

The proposed action, including the helicopter use plus other activities discussed above, could culminate in up to 1-5 years of intense human activity in the action area; 3 years is roughly the period of time a female grizzly bear is teaching her young about the various resources in her home range. Consequently, depending on how long the construction-related activities take to complete, at least one generation of cubs that would otherwise utilize the action area may not learn of available resources there. Thus, adverse effects in the form of increased stress and disturbance to grizzly bears are expected for up to 10 days as a result of helicopter use during the non-denning period.

Effects of Long-Term Recreational Use

Denning Season

The primary recreational use season in the Hellroaring Basin area will be from early December through late March, which is the season during which most grizzly bears in the NCDE are in their dens (NCDE subcommittee 2018). Skiers will begin using the Hellroaring Basin area generally after the time that bears have already entered the den, and will cease using the area before bears emerge in the spring. Thus we do not expect any effects from the act of skiing or other winter recreational use.

Non-Denning Season

The Forest has included multiple design features (see B. Conservation Measures in the BA and reiterated in the Proposed Action above) to help minimize human disturbance in the non-denning season and thereby minimize the effects to grizzly bears in the Hellroaring Basin area. As a measure to protect spring habitat and lessen disturbance to bears after den emergence, Hellroaring Basin will be closed to skiers annually on April 1. Although recreational use of Hellroaring Basin will not be prohibited in the summer and fall, multiple design features will help to minimize disturbance in the non-denning season, including prohibiting public motorized use or mountain bike use of the service roads, prohibiting motorized use, and deterring non-motorized use of the cat track.

Given the steep terrain in Hellroaring Basin, it is unlikely that abundant dispersed recreation use will occur. However, the Service does anticipate some increased use as summer visitors could be enticed to explore the newly opened slopes for hiking or berry picking, resulting in disturbance, habituation, and/or conflicts with bears using the area. This would be additive to any disturbance associated with the pulse effects resulting from the 3 weeks of maintenance each year during the non-denning season, as well as the effect of additional human use in the basin associated with the new Trail 2 associated with the Taylor Hellroaring project that would allow non-motorized access from the southern ridge into the lower part of the basin (USFS 2018).

Because recreational use in the non-denning season will be very limited and not condoned by the permit holder, the amount and intensity of use is expected to be slightly above the existing baseline. Given the overall small size of the Hellroaring Basin area in relation to a grizzly bear's home range, the effects of any dispersed, non-motorized recreation in the non-denning season is expected to have insignificant effects to grizzly bears.

No sites would exist within the Hellroaring Basin area that could create a source of attractants during the non-denning season in the Hellroaring Basin area. Ski lifts would not be operational for recreation during the non-denning season, no other developed structures will exist, and the Flathead National Forest has a food and attractant storage order in place that includes this area. Therefore, no effects to bears are expected from attractants.

Road Construction and Use

Two miles of new service roads would be constructed in the Hellroaring Basin area. One would stem off of an open National Forest System road (9790) at the top of the basin. The other would connect the base of the proposed new chair lifts at “Grand Junction” in the middle of the basin to the already developed face of Big Mountain. These roads will be permitted for use only by Whitefish Mountain Resorts for access and maintenance of the facilities. The roads will not be open to public motorized use, nor will mountain biking be allowed on the service roads.

According to road classification protocols (see Appendix 6, Table 3, in the NCDE Grizzly Bear Conservation Strategy that defines this rule), these roads would be considered small private roads and would not contribute towards OMRD or TMRD for the subunit. However, the Service still considers the effects of these roads to individual grizzly bears, and acknowledges that there could be disturbance or displacement as a result of the construction and use of these roads.

The Hellroaring Basin area is not currently considered secure core, although it has long been recognized as an area that provides secure, unroaded habitat for grizzly bears (but is not large enough to count as secure core). Thus the roads would not decrease any core, but would potentially cause displacement from habitats within 500 m of the roads. The two access roads would have yearlong closed gates on them to restrict public access, but would not have restrictions on the number of trips that the permittee could use to access the Hellroaring Basin area for monitoring, maintenance, and other activities. Because of the unrestricted use, the effects of these roads in terms of their potential to displace grizzly bears could be similar to either an administrative use (gated) road or a very low-use open road. The potential for mortality would be lower than along an open public road, as contractors and permittees would not be allowed to carry firearms nor to hunt, and they would be trained in bear safety (see Conservation Measures). However, the unlimited administrative use of the roads would likely contribute to the adverse effect of long-term displacement of a very few female grizzly bears using the area from key habitats and impair their normal ability to find food resources, breed and raise young, and find shelter.

This displacement is in addition to the existing (baseline) motorized access condition that is likely resulting in adverse effects to grizzly bears in the action area (Werner Creek and Canyon McGinnis subunits). The existing (baseline) access condition would not impart any adverse effects to grizzly bears in addition to those analyzed in the 2017 biological opinion, and the baseline access condition is in compliance with the incidental take statement of that opinion. Thus the adverse effects for the Hellroaring Basin Improvement project related to roads stems from the use of two miles of service roads that is in addition to effects previously analyzed in the 2017 biological opinion.

Effects of Snow Compaction & Blasting

A regular part of maintenance for safe conditions in the Basin will include blasting for avalanche control, which could potentially disturb denning habitat for grizzly bears. The Forest estimates there are approximately 30 acres of denning habitat on the upper slope of Hellroaring Peak. The Forest reported discovering a potential grizzly bear den near the Hellroaring Basin area during

field surveys for the Taylor Hellroaring project. Similar habitat exists in the upper part of Hellroaring Basin, and thus denning habitat could occur within the area to be developed and where blasting could occur. However, across the two subunits there are over 20,000 acres of potential denning habitat, and thus the chances of a grizzly bear denning in the Hellroaring Basin are low.

Due to their relatively constant body temperature in the den, hibernating grizzly bears can be easily aroused and have been known to exit or relocate dens when disturbed by seismic or mining activity (Harding and Nagy 1980) or other human activities (Swenson et al. 1997), although den abandonment is rare and usually occurs early in the denning season (Reynolds et al. 1986, Swenson et al. 1997, Hegg et al. 2010). Linnell and others (2000) reported that bears readily den within 0.6–1.2 mi of human activity (roads, habitations, industrial activity) and appear to be undisturbed by most activity that occurs at distances farther than 0.6 mi. They cautioned that human activity within 0.6 mi might lead to den abandonment, especially early in the denning season, which could cause cub mortality.

Blasting could occur within 0.6 mi of suitable denning habitat in the Hellroaring Basin area. Because blasting for avalanche control typically occurs well into the winter season, when snow loads start to compound and create more dangerous conditions, any blasting that would occur within 0.6 miles of the denning habitat would likely occur well after bears have entered their dens. Grooming and other winter maintenance activities are unlikely to create enough disturbance to cause den abandonment. Therefore, we expect the effects to grizzly bears of winter maintenance activities to be discountable, or very unlikely to occur.

D. Cumulative Effects to Grizzly Bears

The implementing regulations for section 7 define cumulative effects as “...those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation.” (50 CFR 402.02). 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. It is important to note that the section 7 definition (related to the Act) is not the same as the definition of “cumulative effects” under the National Environmental Policy Act.

Future activities will occur on non-federal land within the action area. Such activities could include residential and recreational development and use, timber harvest, fuel reduction around private developments, livestock grazing, and other actions. However, at this time, specific future actions being considered or proposed on non-federal land that could have cumulative effects with the proposed action are not known. To some degree, motorized routes, developed sites, and livestock grazing on private lands (where known) were incorporated into the 2011 baseline figures for grizzly bear habitat measures in the draft NCDE conservation strategy. However, future motorized route construction and use, increases in developed sites, and changes in livestock management on private land do not count against the habitat standards imposed.

While future non-federal actions are difficult to anticipate, these effects may be limited due to the large extent of federally-administered land in the action area (90% of action area). State of

Montana lands in the Werner Creek subunit are administered under a Habitat Conservation Plan. Private lands within the Canyon McGinnis subunit will likely continue to see timber harvest, private development, and other activities that could affect grizzly bears, although no particulars are known at this time. Mortality related to attractants on private lands continues to be one of the most substantial concerns for grizzly bears in the NCDE. Flathead County is considered one of the fastest growing counties in Montana, and year-long visitation has increased over the past several decades. Disturbances and habitat loss caused by human development and land use will continue to have a cumulative impact on grizzly bears through disturbance, displacement, and increased mortality risk.

Future growth on private lands at or near Whitefish Mountain Resort is outside of the action area, but is a consideration for this project. With increased development and human use comes increased opportunities for bear-human conflicts. Although the number of bear-human conflicts may increase as the number of people residing and recreating in the area grows, the extent of the increase is difficult to predict because it is dependent upon a multitude of factors. Public attitude is a most important factor. Continued and increased public information programs will be required to reduce the number of bear-human conflicts in developed areas.

E. Conclusion for Grizzly Bears

After reviewing the current status of the grizzly bear, the environmental baseline for the action area, the effects of the action, and the cumulative effects, it is the Service's opinion that the proposed Hellroaring Basin Improvement Project is 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 2019), correspondence during this consultation process, information in our files, and informal discussions between the Service and the Forest.

The proposed project may result in adverse effects to individual grizzly bears as a result of the construction and use of the maintenance roads and the use of low-flying helicopters to construct ski lifts. Based on the best available scientific information reviewed in this consultation, and in the consultation on the Revised Forest Plan, such adverse effects will not negatively impact the recovery of the NCDE grizzly bear population.

It is the Service's opinion that the proposed action conforms to all of the standards and guidelines in the Revised Forest Plan that recently underwent consultation (USFS 2017; USFWS 2017). In that biological opinion, the Service found that adherence to the 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 non-jeopardy conclusion as detailed and analyzed in this biological opinion.

Factors related to the Action Area:

- The existing (baseline) access condition is likely resulting in adverse effects to grizzly bears in the action area (Werner Creek and Canyon McGinnis subunits). The existing (baseline) access condition would not impart any adverse effects to grizzly bears in addition to those analyzed in the 2017 biological opinion, and the baseline access condition is in compliance with the incidental take statement of that opinion. Thus, the effects analysis related to the existing access condition is tiered to the 2017 biological opinion and the baseline access condition is in compliance with the incidental take statement of that opinion.
- The proposed new roads (2 miles) would be closed to public motorized access, and because their use would be under permit, would be considered as private roads. Although the roads would be closed to the public they would receive use for maintenance and monitoring of the Hellroaring Basin area that would be restricted to a 3-week window, an additional 10 trips per year per road, and not including springtime. Because the existing condition related to motorized access is resulting in adverse effects to grizzly bears, the addition of new roads that will have some use by the permittee would result in additional adverse effects.
- Helicopter flights, combined with on-the-ground mechanical disturbance, could cause female grizzly bears to avoid the area, and potentially teach their cubs to avoid the area, limiting resources, potentially resulting in adverse effects to grizzly bears. While these effects could affect feeding, breeding, or sheltering short-term, the affected area is a very small percentage of a female grizzly's home range (approximately 2-3%, conservatively), and thus would not result in effects that would rise to the level of increased mortality.
- Disturbance associated with construction of the new ski runs, gladed areas, lifts, service roads, and other ski area improvements would result in short-term pulses of disturbance to any grizzly bears in the area for up to 5 years. The Service does not expect the disturbance to be constant during that timeframe, but rather to occur in pulses as the construction is completed. Such effects would be insignificant to grizzly bears.
- Multiple design features, including spring timing restrictions within spring habitat, would minimize disturbance to grizzly bears in the non-denning season. Summer and fall use of the area by the recreating public would not be promoted, and use by Whitefish Mountain Resort staff or contractors would be restricted to a three week pulse of activity each year, which is not expected to substantially increase disturbance to grizzly bears that may be using the area.

- Winter recreation and maintenance activities are not expected to affect grizzly bears, as that use will occur during the season in which grizzly bears are in their dens.

Although the Service anticipates the project to adversely affect individual grizzly bears within the action area, the adverse effects would be non-lethal to individuals, and would still allow for use and occupancy of the Werner and Canyon-McGinnis subunits. Thus the survival and recovery of the NCDE grizzly bear population would not be negatively affected. The project would not jeopardize the continued existence of grizzly bears.

Factors related to the NCDE grizzly bear population:

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 1,029 grizzly bears (USFWS 2019), an estimated positive population trend of three percent annually (Mace and Roberts 2011) and the current distribution of grizzly bears.. Secure habitat levels have been maintained since 2011. Due to its connectivity to large populations in Canada, the NCDE has the potential to serve as an important genetic corridor between Canadian grizzly bear populations and the GYE, the BE, and the CYE, and is a potential source population for the BE, which is currently unoccupied. The NCDE grizzly bear population currently meets all the demographic recovery criteria, including number of BMUs occupied by family groups and sustainable human-caused mortality levels for both total and female grizzly bears. We believe the NCDE has recovered and we are now in a process to evaluate whether delisting is warranted.

While adverse effects may occur on a very small number of individual female grizzly bears that may be 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 the proposed project 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 distribution, reproduction, or numbers of grizzly bears in the NCDE are not likely to be reduced.

Because the proposed Hellroaring Basin Improvements project would not reduce the reproduction, numbers, or distribution of grizzly bears in the NCDE, and considering the status of the NCDE grizzly bear population, we conclude that the level of adverse effects is not reasonably expected to reduce appreciably the likelihood of both the survival and recovery of grizzly bears.

F. Incidental Take Statement for Grizzly Bears

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. *Take* is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to

engage in any such conduct (Act, section 3). *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 essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). *Harass* is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering (50 CFR 17.3). *Incidental take* is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity (50 CFR 402.02). 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 the Terms and Conditions of this Incidental Take Statement.

The measures described below are non-discretionary and must be undertaken by the Flathead National Forest (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 a contractor to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to a contract, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Forest must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 C.F.R. § 402.14(i)(3)].

Amount or Extent of Take Anticipated

The Service concludes that the proposed Hellroaring Basin Improvement Project would result in disturbance and displacement effects to grizzly bears on the Flathead National Forest that could potentially result in incidental take. The incidental take would be the result of disturbance and displacement effects related to motorized access and helicopter use. We expect this take as some impairment of normal breeding and feeding behavior of females, which would influence potential levels of reproductive success. The existing Forest plans and policies, combined with the proposed conservation measures of the Hellroaring Basin Improvement Project, would remove the risk of direct take (i.e. mortality) of grizzly bears.

Based upon the scientific information available on the effects of disturbance on grizzly bears, it is the biological opinion of the Service that the potential displacement of grizzly bears from portions of the action area is likely to affect very few adult female grizzly bears attempting to use this area and could result in some impairment of feeding and/or breeding. However, there is no scientific or commercial information available as to the numbers of females whose home range involves the action area. Likewise, there is no scientific or commercial information available that quantifies the effects of disturbance or displacement on the reproductive potential of grizzly bears. We expect displacement effects that result in decreased fitness of adult females (to the degree that reproduction loss or loss of cubs occurred) would be relatively low based on the rationale found in the biological opinion. Not all grizzly bears, including females, with home ranges encompassing the action area would be significantly impacted. There are existing activities in the action area that currently likely impart disturbance and displacement effects on

grizzly bears. The best information suggests that there would initially be increased displacement effects on female grizzly bears using the action area as the new roads are constructed and used and as helicopters are used. Several design features moderate the impact of this displacement, particularly those that limit construction to a 5 year period, and those that limit maintenance after that to a 3 week period each year. Some bears may habituate to the noise and disturbance over time and regain use of habitats.

The Service anticipates incidental take of grizzly bears resulting from the disturbance and displacement from the action area would be difficult to detect. Grizzly bear cub mortality or reduced reproductive success resulting from displacement from habitat usually cannot be documented. The Service is unaware of scientific or commercial information that could be used to quantify the exact level of incidental take as a result of disturbances to adult females associated with the proposed project. In such instances, we use surrogate measures to determine whether anticipated levels of take would be exceeded.

Based on research detailed earlier in this biological opinion, the Service has defined harm of grizzly bears in terms of adverse habitat conditions caused by motorized access and helicopter use, which may displace individual grizzly bears from key habitat to the extent that significant under-use of habitat by grizzly bears occurs. 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.

The incidental take we anticipate would be harm to a very low number of female grizzly bears that may inhabit the Hellroaring Basin area, which could be roughly 3% of a female's home range, from helicopter-related disturbance and displacement from the 2 miles of service roads. An adult female grizzly bear may be wary of humans and human-generated disturbance, which may disrupt normal breeding (or more specifically, cub rearing) or feeding patterns. We do not expect all adult female grizzly bears that may occur in the action area to suffer disruptions in normal breeding or feeding patterns. We do not expect any female to experience permanent effects (lasting more than one to two reproductive cycles), given the greatest effects would be within the first few years of construction. Variables such as annual climate and resulting habitat and food resource conditions, the level of human activity, and the number of grizzly bears using an area may change over time and are all factors influencing the displacement within a home range.

While incidental take may occur, grizzly bears are individualistic and display a wide variation in their tolerance of, and response to, human activity and road density. 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 the grizzly bears due to displacement. 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 the project. We lack specific information on the precise number of adult female grizzly bears that use the action area, but due to the location and scale of the project, we reasonably assume one to a very few adult females would be affected.
- 2) Individual grizzly bears would react differently to the disturbance. Not all adult female bears that are exposed to disturbances from construction and maintenance activities would be adversely impacted to the point of incidental take.
- 3) 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, 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 forested, mountainous landscapes.
- 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 policy, as stated in the Endangered Species Consultation Handbook (March 1998), some detectable measure of effect should be provided, such as the relative occurrence of the species or a surrogate species in the local community, or amount of habitat used by the species, to serve as a measure for take. Take also may be expressed as a change in habitat characteristics affecting the species (Handbook, p 4-47 to 4-48). In instances where incidental take is difficult to quantify, the Service uses a surrogate measure of take.

The surrogate measures of incidental take are presented below:

- The spatial area to be affected by new development that includes the 959 acre project area.
- The 10 days of helicopter flights for chairlift construction and deconstruction and helicopter flight paths that do not affect secure core.
- The 2.0 miles of new access roads that will be constructed and used for construction, log haul, and maintenance of the Hellroaring Basin area.

If activities associated with the Hellroaring Basin Improvement Project result in effects that exceed the surrogate measures above, then the level of incidental take we anticipated in this

biological opinion would be exceeded and therefore the level of take exempted would be exceeded. Under CFR 402.16 (1), if any of the above scenarios occur, reinitiation of formal 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 would likely be to just one or a few individual grizzly bears, and is not expected to result in mortality of any grizzly bears. Rather, some low level of effect on the normal behavior and use of the area could be expected, which could have minor effects to reproductive potential and/or feeding patterns of individual female grizzly bears in the area. The best information indicates the overall status of the NCDE grizzly bear population is stable to increasing. Impacts on the grizzly bear population, including anticipated levels of incidental take, as a result of the Hellroaring Basin Improvements project will not appreciably reduce survival or the recovery of the species. Further, considering the grizzly bear recovery strategies (U.S. Department of Interior, 1993; Northern Continental Divide Ecosystem Subcommittee, 2018) 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.

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 the proposed Hellroaring Basin Improvement project. 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 the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of grizzly bears.

- A. Reduce the potential for harm caused by the disturbance or displacement of female grizzly bears as a result of proposed road construction and use in the action area.
- B. Reduce the potential for harm caused by the disturbance, displacement, and/or habituation of female grizzly bears as a result of helicopter use in the action area.

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. These terms and conditions are non-discretionary:

To fulfill reasonable and prudent measure A, the following terms and conditions shall be implemented:

1. The Forest shall ensure that gates on the service roads to Grand Junction and Hellroaring Peak would be installed immediately upon construction of these roads.
2. The exempted activities that allow for use of the Grand Junction and Hellroaring Peak Service Roads outside of the annual three-week maintenance period during the non-denning season (including routine inspections, monitoring, assessments, visual checks, or addressing minor safety items) will be limited to limited to 10 round trips of motorized use per year per road.

To fulfill reasonable and prudent measure B, the following terms and conditions shall be implemented:

3. The Forest shall restrict helicopter use to a total of 10 days in the Hellroaring Basin project area for construction in this project. Flights may only occur between June 1 and November 30.

Reporting Requirements

The Forest shall maintain an up-to-date summary of project-related activity within the action area, including the following:

- a. A list for each year of the dates that construction activities start and cease.
- b. A log of the dates construction begins for each service road and the dates gate installation is completed.
- c. A log of dates of helicopter flights supporting the project including a running total of how many days of use occurred.
- d. A summary of any significant project-related events or observations related to grizzly bears.
- e. Annual dates of the 3-week “maintenance window” that is used in the Hellroaring Basin area, and a log of additional uses of the service roads accessing the Hellroaring Basin area that lists the date and purpose of each visit.

These summary reports will be submitted to the Montana Ecological Services Office annually by March 1, or another date mutually agreed upon. In addition, the Forest shall notify the Montana Ecological Services Office, within 24 hours, of any grizzly bear-human conflicts or the management removal or human-caused death of a grizzly bear associated with implementation of the proposed action.

Closing Statement

Reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. We have included reasonable and prudent measures along with terms and conditions in this

incidental take statement. Reporting requirements were included in order to demonstrate that the level of incidental take exempted through this incidental take statement in not exceeded. 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 Service recognizes and appreciates the many programs currently being implemented by the Flathead National Forest for the benefit of grizzly bears and encourages continued implementation of those programs, especially:

- Information and Education (I&E) programs designed to increase awareness of grizzly bear presence and bear safety practices for Forest visitors, and
- Partnerships with other Federal and state agencies and non-governmental agencies aimed at monitoring effectiveness of resource protection strategies for grizzly bears.

In addition, a few site-specific conservation recommendations may help reduce disturbance to grizzly bears in the Hellroaring Basin area, including:

- Where road 9790 intersects ski runs, gladed areas, and the cat track, the Forest shall ensure slash will be left in a manner that will deter use by hikers and mountain bikers to the extent feasible given skier safety and grooming operations.
- If an increasing trend of unauthorized skier use after April 1 or mountain bike use of service roads, cat track, or ski runs and gladed areas is detected, the Forest and Whitefish Mountain Resort shall work cooperatively with the Service to develop strategies to address the greater-than-anticipated use

Reinitiation Notice

This concludes consultation on the action outlined in your requests for consultation on the effects of the Hellroaring Basin Improvement Project on grizzly bears. As provided in 50 C.F.R. § 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances

where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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IV. BIOLOGICAL OPINION FOR CANADA LYNX

A. Status of the Species and Designated Critical Habitat

Listing History

On March 24, 2000 the Service listed the contiguous United States DPS of the Canada lynx as threatened in fourteen States (65 FR 16052). Subsequently, the Service published a final rule designating critical habitat in November, 2006 (71 FR 66006); however, no federal lands (including NFS lands) were included in the 2006 final rule. In February of 2009, the Service published a final rule (74 FR 8616) that revised the 2006 designation and included designation of Canada lynx critical habitat on federal lands.

In September of 2014, the Service published a final rule (79 FR 54782) that again revised the previous (2009) designation of critical habitat and the distinct population boundary for the contiguous United States DPS for Canada lynx (USFWS 2014). The 2014 revised rule includes all or portions of ten National Forests that appended the NRLMD to their land management plans in 2007. The ten National Forests addressed in this assessment and included in the 2014 revised critical habitat designation are the Idaho Panhandle, Kootenai, Flathead, Lolo, Helena, Lewis & Clark, Gallatin, and Custer in Forest Service Region 1, the Shoshone in Forest Service Region 2, and the Bridger Teton in Forest Service Region 4.

Species Description, Life History and Population Dynamics

The Canada lynx (lynx) is a medium-sized cat with long legs; large, well-furred paws; long tufts on the ears; and a short, black-tipped tail (McCord and Cardoza 1982). Lynx occur in mesic coniferous forests that have cold winters with deep, fluffy snow, and provide a prey base of snowshoe hare (Ruggiero et al. 2000). These forests are generally described as boreal forests that provide optimal habitat for snowshoe hares. In North America, the distribution of lynx is nearly coincident with that of snowshoe hares (Bittner and Rongstad 1982, McCord and Cardoza 1982). Lynx survivorship, productivity, and population dynamics are closely related to snowshoe hare density in all parts of its range. In the extensive boreal forests of Canada, snowshoe hare densities reach peak densities of roughly four to six hares per hectare (or 1.6 to 2.4 per acre) and decline to about 0.1 to 1 per hectare (0.04 to 0.4 per acre) during cyclic lows (Hodges 2000a). Ruggiero et al. (2000) found that a minimum density of snowshoe hares greater than 1.2 hares per acre distributed across a large landscape is necessary to support survival of lynx kittens, as well as recruitment and maintenance of a lynx population.

As mentioned above, snowshoe hares are the primary prey of lynx, comprising 35 to 97 percent of the diet throughout their range (Quinn and Parker 1987, Koehler and Aubry 1994). Other prey items can include various species of squirrels, porcupine, beavers, voles, and even ungulates (reviewed in ILBT 2013). During the cycle when hares become scarce, the proportion and importance of other prey species, especially red squirrel, increases in the diet (Mowat et al. 2000). However, a diet of red squirrels alone might not be adequate to ensure lynx reproduction and survival of kittens (Koehler 1990). Most research has focused on the winter diet. Summer diets are poorly understood throughout the range of lynx. In their review of the literature, Mowat

et al. (2000) reported that summer diets have less snowshoe hare and more alternate prey species, possibly because of a greater availability of other species.

In Canada and Alaska, lynx populations undergo extreme fluctuations in response to the cycling of snowshoe hare, enlarging or dispersing from their home ranges and ceasing the recruitment of young into the population after hare populations decline (Mowat et al. 2000). In the contiguous United States, the degree to which the lynx population fluctuations are influenced by local snowshoe hare population dynamics is unclear. Lynx in the lower U.S. are on the periphery of the species' range in North America, and are naturally limited by the low availability of snowshoe hares, as suggested by large home range size and high kitten mortality. These characteristics appear to be similar to those exhibited by lynx populations in Canada and Alaska during the low phase of the hare population cycle (Aubry et al. 2000). This is likely due to the inherently patchy distribution of lynx and hare habitat in the contiguous United States and correspondingly lower densities of hares.

Individual lynx maintain large home ranges, generally ranging between 12 to 83 square miles (Aubry et al. 2000, Squires et al. 2004, Vashon et al. 2005). The size of lynx home ranges varies depending on abundance of prey, the animal's gender and age, season, and the density of lynx populations (Koehler 1990, Poole 1994, Mowat et al. 2000). When densities of snowshoe hares decline, for example, lynx enlarge their home ranges to obtain sufficient amounts of food to survive and reproduce. Research supports the hypothesis that lynx home ranges at the southern extent of the species' range are generally large compared to those in the core of their range in Canada (Koehler and Aubry 1994, Squires and Laurion 2000).

Lynx are highly mobile and have a propensity to disperse long distances, particularly when prey becomes scarce (Mowat et al. 2000). Lynx also make long distance exploratory movements outside their home ranges (Aubry et al. 2000, Squires et al. 2001, Moen et al. 2010). Aubry et al. (2000) defined exploratory movements as long-distance movements beyond identified home range boundaries, in which the animal returned to its original home range. In Minnesota, exploratory movements were greatest for males during the breeding season in March (Burdett et al. 2007). In Montana, Wyoming, and southern British Columbia, exploratory movements during the summer months by resident lynx have been documented in numerous studies (Apps 2000, Squires and Laurion 2000, Squires and Oakleaf 2005). Distances of these exploratory movements in Montana ranged from 9 to 25 miles, and lasted anywhere between one week to several months (Squires and Laurion 2000).

Habitat Requirements

The primary factor driving lynx behavior and distribution is the distribution of snowshoe hare, their primary prey. Snowshoe hares prefer boreal forest stands that have a dense horizontal understory to provide food, cover, and security from predators. Snowshoe hares feed on conifers, deciduous trees, and shrubs, and density is correlated to understory (horizontal) cover between approximately 3 to 10 feet above the ground or snow level (Hodges 2000b). Habitats most heavily used by snowshoe hares are stands with shrubs, stands that are densely stocked with trees, and stands at ages where branches have more lateral cover at a height used by hares

(Hodges 2000b). Generally, earlier successional forest stages support a greater density of horizontal understory and more abundant snowshoe hares (Wolfe et al. 1982, Koehler 1990, Homyack et al. 2007). Mature, multistoried stands in boreal forests also have adequate dense understory to support abundant snowshoe hares (Griffin 2004, Squires et al. 2006).

Lynx are associated primarily with upper elevation coniferous forests dominated by mixtures of the following vegetation types: Douglas-fir, spruce-fir, fir-hemlock, and on drier sites, lodgepole pine (Aubry et al. 2000). In extreme northern Idaho, northeastern Washington, and northwestern Montana, cedar-hemlock habitat types may also be considered primary vegetation. Secondary vegetation interspersed within subalpine forests may also contribute to lynx habitat. Dry forest types (e.g. ponderosa pine) do not provide lynx habitat.

In the United States, lynx inhabit conifer and conifer-hardwood habitats that support their primary prey, snowshoe hares. Both timber harvest and natural disturbance processes (e.g., fire, insect infestations, and catastrophic wind events) can provide foraging habitat for lynx when resulting understory stem densities and structure provide the forage and cover needs of snowshoe hare (Parker et al. 1983, Bailey et al. 1986, Koehler 1990, Agee 2000). These characteristics also include a dense, multi-layered understory that maximizes cover and browse at both ground level and at varying snow depths throughout the winter in order to provide cover and food for snowshoe hares. Despite the variety of habitats and settings, good snowshoe hare habitat typically has a common feature – dense, horizontal vegetative cover 1 to 3 meters (3 to 10 feet) above the ground or snow level (Hodges 2000b). Multi-story boreal forests usually provide this structure, as well as high levels of cover preferred by lynx.

Cover is important to lynx when hunting (Brand et al. 1976). Lynx have been observed (via snow tracking) to avoid large openings during daily movements within the home range, seeming to prefer to move through continuous forest, using the highest terrain available such as ridges and saddles (Koehler 1990, Staples 1995). Kesterson (1988) and Staples (1995) reported that lynx hunted along the edges of mature stands within a burned forest matrix, and Major (1989) found that lynx hunted along the edge of dense riparian willow stands. In Montana, lynx preferentially foraged in spruce-fir forests with high horizontal cover, abundant hares, and large diameter (greater than 11 inches dbh) trees during the winter (Squires et al. 2006). Lynx tended to avoid sparse, open forest and forest stands dominated by small-diameter trees during the winter.

Lynx use a variety of types of large woody debris, such as downed logs, root wads, and windfalls, to provide denning sites with security and thermal cover for kittens (McCord and Cardoza 1982, Koehler and Brittell 1990, Squires et al. 2006, Squires et al. 2008). During the first few months of life, kittens are left alone at these sites when the female lynx hunts. Downed logs and overhead cover provide protection of kittens from predators, such as owls, hawks, and other carnivores during this period. The age of the forest stand does not seem as important for denning habitat as the amount of horizontal structure available (Mowat et al. 2000, USFWS 2007). This cover provides hiding cover and shelter for kittens. Den sites may be located within older regenerating stands (>20 years since disturbance) or in mature conifer or mixed conifer-deciduous (typically spruce/fir or spruce/birch) forests. In Montana, lynx selected den sites with

higher horizontal cover than elsewhere in the animal's home range (Squires et al. 2006, Squires et al. 2008).

Denning habitat in or near foraging habitat is likely to be most functional and selected by females. The hunting range of females is restricted at the time of parturition, and their need to feed kittens requires an abundance of prey. Lynx, like other felids, frequently move their kittens until they are old enough to hunt with their mother. Multiple nursery sites are used that provide kittens with overhead cover and protection from predators and the elements. Downed logs and overhead cover throughout the home range provides security when lynx kittens are old enough to travel (Koehler 1990).

Range-wide Status

On January 11, 2018, the U.S. Fish and Wildlife Service (Service) announced the completion of a Species Status Assessment (SSA), a scientific review of the Canada lynx in the contiguous United States (USFWS 2018). The review concludes that the Canada lynx may no longer warrant protection under the Endangered Species Act (ESA) and should be considered for delisting due to recovery. This recommendation is the result of 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. As a result of this status review, the Service has begun development of a proposed rule to delist the species. Details about the status assessment and range-wide status of the species can be found in the Species Status Assessment (USFWS 2018), are incorporated here by reference.

Table 2. Lynx Geographic Units in the Contiguous United States DPS.

Unit No.	Name	Size (km ²)
Unit 1	Northern Maine	28,909
Unit 2	Northeastern Minnesota	21,101
Unit 3	Northwestern Montana/Northeastern Idaho	26,997
Unit 4	North-central Washington	5,176
Unit 5	Greater Yellowstone Area	23,687
Unit 6	Western Colorado	25,294

Lynx in the Distinct Population Segment (DPS) in the continental United States exist in several geographical units (Table 2). The Hellroaring Basin Improvement Project is within Unit 3 – Northwestern Montana/Northeastern Idaho. The historical and current sizes of the resident lynx

population in this unit are unknown, but it is thought currently to be capable of supporting 200-300 lynx home ranges. Habitats capable of supporting resident lynx in this unit are naturally patchier and less-broadly distributed (Squires et al. 2006, 2013), and lynx therefore naturally rarer, than was thought when the DPS was listed (ILBT 2013, Lynx SSA Team 2016). Minor genetic differences suggest 3 subpopulations in the northwest (Purcell Mountains), central (Seeley Lake), and southern (Garnet Mountains) parts of the unit. No lynx were detected in the Garnet Range from 2011 to 2015, prompting concerns about the potential loss of the small resident population (perhaps 7-10 lynx) documented there in the mid-1980s and again recently from 2002 to 2010. However, whether this absence indicates the extirpation of a previously persistent resident population or the temporary loss of an historically ephemeral population is uncertain. A single lynx was verified in the Garnet Range in February 2016, indicating that natural recolonization of the area is possible; however, subsequent surveys have failed to detect that lynx or other lynx, and there currently remains no evidence of lynx residency in this mountain range (Lieberg 2017, pers. comm.).

Most (about 90 percent) of this geographical unit is managed to conserve and restore lynx and hare habitats, including on federal, state, tribal, and some private lands. Past timber harvest and associated management (e.g., thinning, road construction, fire suppression) appear to have had localized impacts but not to have diminished the unit's ability to support resident lynx, with habitats in the Garnet Range being a possible exception. The size, frequency, and intensity of wildfires in this unit have increased over the past several decades, likely in response to climate warming, but population-level impacts to lynx have not been documented. Whether (and if so to what extent) other climate-mediated factors have influenced the current condition of lynx populations or habitats in this unit are also unknown. Regulations prohibit lynx trapping and require measures to reduce the likelihood of trapping lynx incidentally when legally trapping other species. Hare densities have not been estimated broadly throughout the unit but appear to be low or marginal even in what is considered the highest-quality habitat, suggesting that even small decreases in habitat quality/hare densities could influence its continued ability to support resident lynx. The role of past and recent immigration in maintaining the demographic and genetic health of current lynx populations in this unit is unknown, but peaks in cyclic lynx numbers in Canada have declined, especially when compared to the unprecedented irruptions of the early 1960s and 1970s, and there is no evidence of significant immigration into this unit since then.

Factors Affecting the Status of Lynx Rangewide

The final rule listing lynx as a threatened species (65 FR 16052) concluded that the primary factor threatening the lynx DPS was the inadequacy of existing regulatory mechanisms, specifically, the lack of guidance for conservation of lynx in federal land management plans. The USFS manages the vast majority of lynx habitat in the U.S. The Service concluded that the lack of Forest Plan guidance for conservation of lynx, as evidenced by the fact that, at the time of listing, forest plans allowed or directed actions that cumulatively could adversely affect lynx, was a significant threat to the contiguous United States DPS of lynx. The remanded determination in our clarifications of findings of our final rule (68 FR 40076) affirmed the findings in the final rule.

Based on a review of all past and recent literature, the following are risk factors potentially affecting lynx:

- Vegetation management
- Wildland fire management
- Habitat fragmentation
- Recreation
- Minerals & energy development
- Forest/Backcountry roads and trails
- Climate change

These risk factors have varying effects on lynx, depending upon the nature, location, duration and timing of the activity. Some risk factors present more likelihood of risks to lynx, while others are relatively benign in effects. The Service believes vegetation management (including fuels management), wildfire management, habitat loss and fragmentation, and climate change have the greatest potential to influence lynx and snowshoe hares at the population-level. Other risks that may impact lynx but are unlikely to result in population-level effects include incidental trapping, recreation, mineral and energy development, illegal shooting, forest /backcountry roads and trails, and livestock grazing.

A thorough discussion of risk factors is included in the Revised LCAS prepared by the Interagency Lynx Biological Team (ILBT 2013) and in the Species Status Assessment (USFWS 2018), and incorporated in this biological opinion by reference. Since those documents were published, a new study on the effects of winter recreation on lynx was published (Olson et al. 2018). Details of this study are presented in the effects analysis below.

Implementation of Management Direction on Federally Administered Lands

As previously stated, in the Northern Rockies region of the lynx DPS, the NRLMD (USFS 2007) amended 18 National Forest Plans to address the “lack of guidance for conservation of lynx in federal land management Plans.” The NRLMD includes standards and guidelines intended to avoid or reduce the potential for projects proposed under Forest Plans to adversely affect lynx. A suite of standards and guidelines in the NRLMD promote and conserve the habitat conditions needed to produce adequate snowshoe hare (lynx primary prey) densities to sustain lynx home ranges, and thus sustain lynx populations. The NRLMD is intended to address the major threats to lynx and the inadequacy of existing regulatory mechanisms in the Northern Rockies region in order to reduce adverse effects and avoid jeopardy through its implementation.

In support of the biological opinion for the Flathead National Forest Revised Plan (USFWS 2017), the Service reviewed the latest publications and information providing the best available science on the status and factors influencing lynx and snowshoe hare populations in the Northern Rocky Mountains region. Based on our updated review of the literature, we concluded that the provisions of the NRLMD continue to address the major risks to lynx on the FNF.

The primary issues addressed in the NRLMD included snowshoe hare habitat, wildland fire risk, and the nature of management direction applied to grazing, mineral development, roads, and over-the-snow recreation. In addition to the vegetation management direction the NRLMD identifies standards and guidelines specific to four other categories of risk factors including: (1) all management practices and activities; (2) livestock management; (3) human use (i.e. special uses, recreation, road, highways, mineral and energy development); and (4) linkage areas. The objectives, standards, and guidelines of the NRLMD were incorporated into the Flathead National Forest's Plan with minor modifications (USDA FS 2018). See Appendix A. of the Forest Plan (USDA FS 2018) and Appendix 6 of the biological assessment for the Hellroaring Basin Improvement project (USDA FS 2019) for a detailed list of the objectives, standards, and guidelines.

Status of Critical Habitat

The Service published a revised designation of critical habitat for the contiguous United States distinct population segment of the Canada lynx on September 12, 2014, which became effective on October 14, 2014 (79 FR 54782). In total, approximately 38,955 square miles have been designated within five units in the states of Maine, Minnesota, Montana, Wyoming, Idaho, and Washington.

The five units contain the physical and biological features essential to the conservation of the lynx as they are comprised of the primary constituent element and its components laid out in the appropriate quantity and spatial arrangement. The units are discussed extensively in the final rule revising designated critical habitat for lynx (79 FR 54782), which includes a discussion on the primary constituent element and its components. The recently-revised Flathead Forest Plan (U.S. Forest Service 2018) also includes an extensive review of the status of Canada lynx critical habitat on the Flathead National Forest, in Unit 3, and in the other critical habitat units, and is incorporated into this biological opinion by reference.

Primary Constituent Element of Critical Habitat

The physical and biological features that are essential to the conservation of lynx were identified within the geographical area occupied by lynx at the time of listing. These physical and biological features are the primary constituent element (PCE) laid out in a specific quantity and spatial arrangement to be essential to the conservation of the species. Based on this and the current knowledge of the life history, biology, and ecology of lynx, the 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.

Activities that May Affect Critical Habitat

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.

Previous Consultations and Conservation Efforts

In 2017 the Flathead National Forest consulted with the Service on the effects of the Revised Forest Plan on lynx and the conservation role of lynx critical habitat Unit 3 (USFWS 2017). This consultation considered all previous consultations on the Flathead National Forest, including those related to the Whitefish Mountain Resort, as part of the baseline for evaluation. Therefore, all previous consultations have been considered.

B. Environmental Baseline

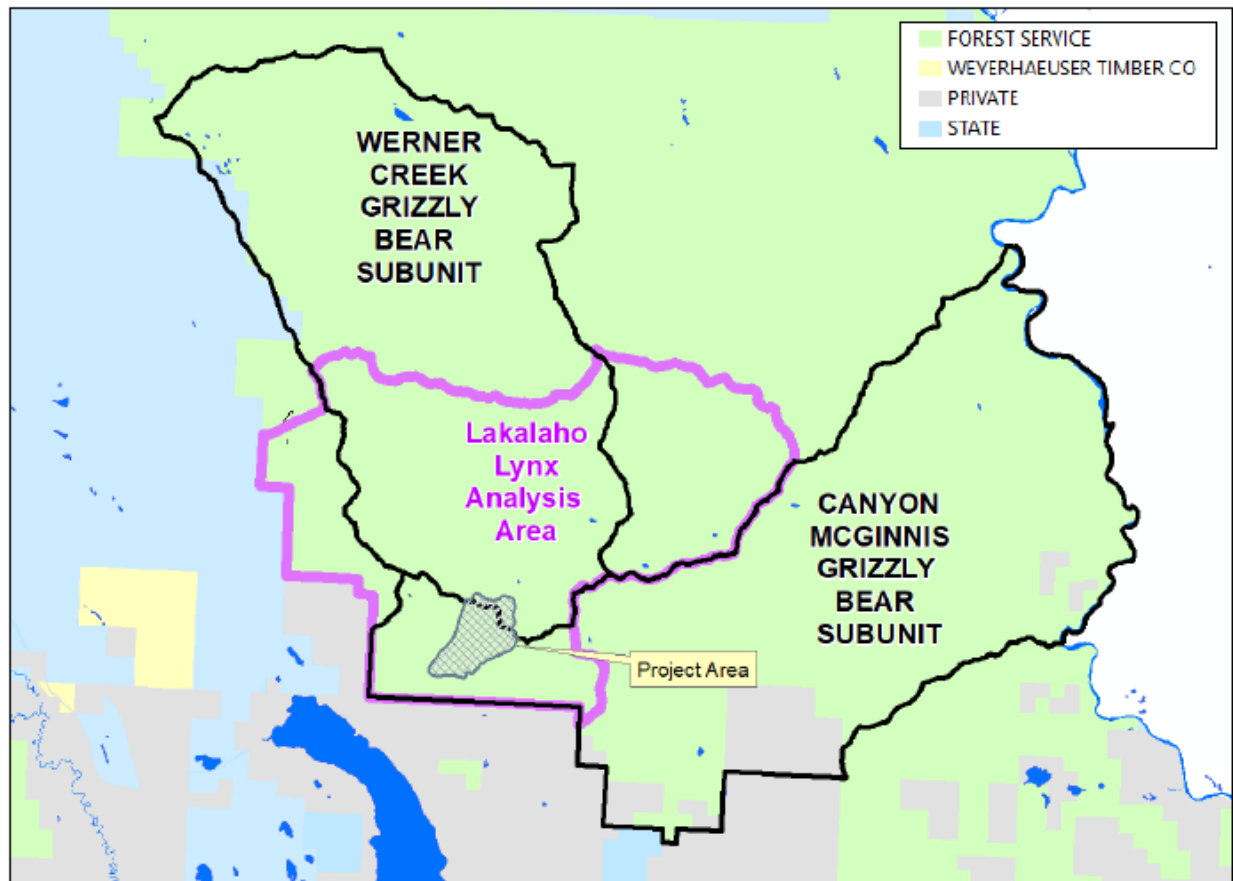
“Environmental baseline” refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of 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 process. 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.” [50 CFR 402.02 (2019)].

Action Area

The “action area” includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action [50 CFR § 402.02]. The action area does not necessarily include all areas potentially frequented by far-ranging, or migrant, species (USFWS and NMFS 1998).

The action area for analysis of effects to lynx and to lynx critical habitat is the Lakalaho Lynx Analysis Unit (LAU). At 22,456 acres, the LAU is large enough to represent the average home range size of a female lynx and contain adequate habitat and landscapes to support lynx year-round (U.S. Department of Interior, 2007). The Flathead National Forest manages all of the lands within the Lakalaho LAU, and the project area for the proposed action is fully within the LAU (see Figure 3).

Figure 3. Location of the Hellroaring Basin Improvement Project area in relation to the Lakalaho LAU (action area for lynx analysis).



Status of the Species within the Action Area

According to the biological assessment (USDA FS 2019) and personal conversations with the project biologist (A. Jacobs, June 2019), Canada lynx have been recorded in and near the Lakalaho LAU, including sightings by ski area personnel of lynx along the edges of ski runs at night when grooming. Current and past lynx occurrence across the Flathead National Forest is detailed in the Revised Forest Plan biological Assessment (USDA FS 2017).

Factors Affecting Species Environment within the Action Area

The Lakalaho LAU includes many diverse forest types that provide habitat for lynx, including subalpine fir, Engelmann spruce, Douglas fir, lodgepole pine, and a small component of whitebark and western white pine. The Flathead National Forest developed a lynx habitat GIS layer associated with the Forest Plan revision, and updated the data for this project based on field review, as detailed in the biological assessment (USDA Forest Service 2019). About 94% of the Lakalaho LAU is currently mapped as “lynx habitat” (Table 3). Denning habitat is well

distributed throughout the LAU and most denning areas have feeding habitat nearby (USFS 2019).

Table 3. Baseline condition of lynx habitat by structural stage within the Lakalaho LAU. Acres (and % of lynx habitat) shown represent the existing baseline, considering the Taylor Hellroaring project.

LAU Name	LAU Total Acres	Total Lynx Habitat Acres	Stand Initiation¹ Acres (% of lynx habitat)	Early Stand Initiation² Acres (% of lynx habitat)	Multistory³ Acres (% of lynx habitat)	Other⁴ (does not provide forage e.g. stem exclusion) Acres (% of lynx habitat)
Lakalaho	22,456	21,103	1,836 (8.7%)	1,744 (8.3%)	9,391 (44.5%)	8,132 (38.5%)

¹Stand initiation structural stage that currently provides year-round snowshoe hare habitat because the trees have grown tall enough to protrude above the snow in winter.

²Stand initiation structural stage where the trees have not grown tall enough to protrude above the snow in winter but can provide snowshoe hare habitat during the non-winter months and is typically moving toward year-round snowshoe hare habitat.

³Multistory structural stage with many age classes and vegetation layers that provide year-round snowshoe hare habitat via dense horizontal cover.

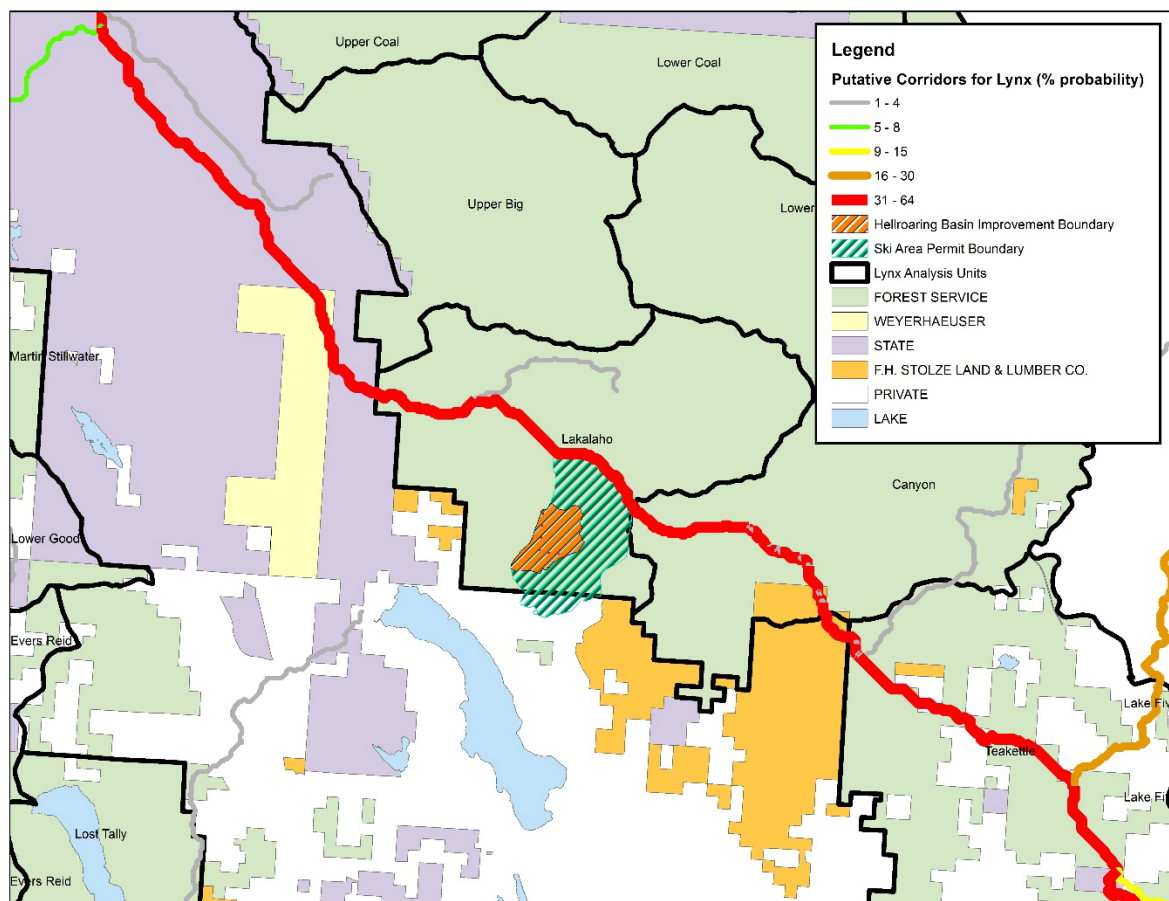
⁴Other –Closed canopy lacking dense horizontal cover; does not provide snowshoe hare habitat due to lack of dense horizontal cover; e.g. Stem Exclusion Structural Stage.

Forest structural stages that provide the best winter forage—stand initiation and multistory—comprise over half (54%) of the lynx habitat within the LAU and are well distributed throughout, including large, connected areas of mature multistory lynx habitat (see maps in biological assessment, US Forest Service 2019). The abundance and distribution of winter foraging habitat and the abundance and connectivity of mature forest indicates that the LAU is in good condition for lynx occupancy and use by lynx, including reproductively successful female lynx (Holbrook et al. 2019).

The existing Whitefish Mountain Resort has likely affected lynx habitat and use of the area for the past several decades. Applying the findings from recent research on the effects of developed ski areas on lynx in Colorado (Olson et al. 2018), it is likely that any lynx in the area avoid the existing developed portion of the permitted ski area (roughly 1,200 acres), particularly in the winter. There have been occasional reports of lynx sightings in and amongst the runs, particularly at night when runs are being groomed. Thus, it is not likely complete avoidance, but some level of underuse of the existing developed area that reduces the amount of accessible habitat. While some of the area is not mapped as lynx habitat, other portions are considered lynx habitat (see map in Appendix 5 of the biological assessment).

The Lakalaho LAU is bisected by one of the most probable corridors lynx connectivity in western Montana. Squires et al. (2013) used empirical models of both broad-scale resident habitat and fine-scale movement behavior to collectively identify functional corridors for lynx conservation. They concluded that connectivity between lynx habitat in Canada and that in the conterminous United States is facilitated by only a few putative corridors that extend south from the international border. They proposed that connectivity of lynx in the Northern Rockies is maintained by a primary north–south corridor that extends from the Canadian border and proceeds south along the west side of the Bob Marshall Wilderness Complex. The corridor runs directly to the north of the ski area permit boundary, as shown in Figure 4. Maintaining the integrity of these connectivity corridors is of primary importance to lynx conservation in the Northern Rockies (Squires et al. 2013), and thus the Lakalaho LAU is potentially a very important area for connectivity for lynx.

Figure 4. Putative corridors for movement and connectivity of lynx (Squires et al. 2013) in relation to the proposed Hellroaring Basin Improvement area and the Whitefish Mountain Resort ski area boundary.



None of the other factors listed as possibly affecting lynx are of substantial concern in the Lakalaho LAU. Therefore, the general discussion of factors affecting lynx in the biological

opinion for the Revised Forest Plan for the Flathead National Forest is referenced (USFWS 2017).

C. Effects of the Action

“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 CFR § 402.02 (2019).

Activity Categories

For the Hellroaring Basin Improvement project, creating new ski runs and lifts requires a variety of activities that would affect lynx. To efficiently analyze the effects of all activities for the proposed action, activities were categorized into the following Activity Categories based on the similarity or interrelationship between effects of these activities.

- Vegetation Alterations
- Implementation/Development
- Long-term Recreational Use
- Road Construction and Use
- Snow Compaction and Blasting

Effects of Vegetation Alterations

The proposed action would involve thinning and/or removing trees and shrubs to varying degrees within the proposed ski runs, gladed areas, lift corridors, and terrain modification areas. The effects of the vegetation alterations would be to the structural stage, which highly influences the foraging and denning potential for lynx. Because the permit for the use of the area for skiing would span 15 years or more, the changes to vegetation would be considered permanent, as defined in the glossary for Appendix A of the Flathead National Forest Plan (US Forest Service 2018).

Within ski runs and lift corridors, trees and shrubs would be cut to ground level, which would remove horizontal and canopy cover. These conditions would be maintained in a state in which no vegetation would protrude above the snow in winter. The intent is to maintain this condition indefinitely, thus we consider this action to be a permanent removal of lynx habitat, as the vegetation would not be allowed to grow back to its potential.

Within gladed areas, the vegetation would be thinned, but some trees would be left and the result would be to reduce stand density, converting or maintaining these areas as “Other” or “Stem Exclusion” lynx habitat. Horizontal cover would be kept low enough that the areas would not provide high quality habitat for snowshoe hares, and thus would not provide high quality foraging habitat for lynx.

The biological assessment (U.S. Forest Service 2019) provides detailed information regarding the changes to lynx habitat. Terrain modification outside of existing ski runs would change 1 acre of multistory forage and 1 acre of “other” to early stand initiation. Partial vegetation removal for glading and edge feathering would change 26 acres of multistory forage and 4 acres of stand initiation to “other.” Clearing for ski runs and ski lifts would permanently remove 43 acres of lynx habitat (4 acres of early stand initiation, 3 acres of stand initiation, 21 acres of “other”, and 15 acres of multistory forage). In total, 49 acres of lynx habitat that currently provide high quality winter forage (i.e. multistory forage and stand initiation) would no longer provide foraging habitat for the term of the permit (15 years).

Squires et al. (2010) reported that winter forage may be a limiting factor for lynx in Montana. Lynx depend on a winter prey base at or slightly above the threshold required for persistence; minor reductions in hare density could disproportionately impact lynx. Lynx that use the Hellroaring Basin area for foraging would be adversely affected by the loss of habitat, as it would reduce their potential to access food resources. These changes could adversely affect individual lynx in terms of limiting the individual’s ability to obtain adequate food resources, impairing an individual’s normal reproductive potential, and/or decreasing resiliency to other stressors

Table 4. Summary of estimated changes to potential lynx habitat by structural stage through proposed ski area development in the Lakalaho Lynx Analysis Unit (LAU), shown in increases (+) and decreases (-) in total acres.

	Stand Initiation¹ (winter forage)	Early Stand Initiation² (not providing winter forage)	Multistory³ (forage)	Other⁴ (non-feeding)	Not Lynx Habitat (due permanent clearing)
Change	+ 0 acres - 7 acres	+ 2 acres - 4 acres	+ 0 acres - 42 acres	+30 acres - 23 acres	+ 43 acres - 0 acres
Net change	- 7 acres	- 2 acres	- 42 acres	+ 7 acres	+ 43 acres

¹Stand initiation structural stage that currently provides year-round snowshoe hare habitat because the trees have grown tall enough to protrude above the snow in winter.

²Stand initiation structural stage where the trees have not grown tall enough to protrude above the snow in winter but can provide snowshoe hare habitat during the non-winter months and is typically moving toward year-round snowshoe hare habitat.

³Multistory structural stage with many age classes and vegetation layers that provide year-round snowshoe hare habitat via dense horizontal cover.

⁴Other –Closed canopy lacking dense horizontal cover; does not provide snowshoe hare habitat due to lack of dense horizontal cover; e.g. Stem Exclusion Structural Stage.

Table 5. Estimated post-project potential lynx habitat by structural stage, in acres (and % of lynx habitat) in the Lakalaho LAU.

LAU Name	LAU Total Acres	Total Lynx Habitat Acres	Stand Initiation¹ Acres (% of lynx habitat)	Early Stand Initiation² Acres (% of lynx habitat)	Multistory³ Acres (% of lynx habitat)	Other⁴ (does not provide forage e.g. stem exclusion) Acres (% of lynx habitat)
Lakalaho	22,456	21,060	1,829 (8.7%)	1,742 (8.3%)	9,349 (44.4%)	8,139 (38.6%)

¹Stand initiation structural stage that currently provides year-round snowshoe hare habitat because the trees have grown tall enough to protrude above the snow in winter.

²Stand initiation structural stage where the trees have not grown tall enough to protrude above the snow in winter but can provide snowshoe hare habitat during the non-winter months and is typically moving toward year-round snowshoe hare habitat.

³Multistory structural stage with many age classes and vegetation layers that provide year-round snowshoe hare habitat via dense horizontal cover.

⁴Other –Closed canopy lacking dense horizontal cover; does not provide snowshoe hare habitat due to lack of dense horizontal cover; e.g. Stem Exclusion Structural Stage.

Vegetation alterations that occur in Multistory and Other structural stages would affect lynx denning habitat by reducing coarse woody debris, root wads, and other features that could provide den structures. Because denning habitat is abundant and well-distributed throughout the LAU (U.S. Forest Service 2019), and because denning habitat is not a limiting factor to lynx (unlike winter forage), we expect the effects to denning habitat to be insignificant.

Effects of Implementation/Development

Implementation and development of the new ski runs, gladed areas, lifts, and other proposed features would require the use of ground-based heavy equipment (e.g. logging equipment, excavators) as well as the use of helicopters and lighter/hand-held equipment (e.g. chainsaws, weed eaters). Anecdotal information suggests that lynx are quite tolerant of humans, although individuals may behave differently in response to human presence (ILBT 2013). We do not expect the effects of human disturbance on lynx associated with construction of infrastructure in the Hellroaring Basin to be substantial or significant.

Although some evidence suggests that female lynx may shift their behaviors if human activity occurs around a den site, the likelihood of the proposed action's construction affecting a lynx den is extremely low. Lynx are rare, den sites are rare and are typically not re-used year to year, multiple den sites are used each year, and denning habitat is not limited in the Lakalaho LAU (USFS 2019). If human activities or presence near den sites disturbed lynx, it is unlikely that a

lynx would select a site near a construction site or a new or existing developed area. We expect the likelihood of the proposed action disturbing a lynx or lynx den site to be so unlikely as to be discountable.

Effects of Disturbance from Long-term Recreational Use

Development of the Hellroaring Basin area would primarily be done to facilitate winter skiing on ski runs and in gladed areas in the upper part of the basin. At developed ski areas in Colorado that are similar in size and amount of human use to Whitefish Mountain Resort, lynx tend to avoid the developed ski area during the ski season (Olson et al. 2018, Olson, personal communication, September 2019) and snowshoe hare use of inter-run islands appears to be greatly diminished when those islands are skied (cited in U.S. Fish and Wildlife Service 2013).

Olson et al. (2018) compared the impacts of developed and dispersed winter recreation on lynx in Colorado. They found that lynx did not exhibit strong negative responses to dispersed recreation, but instead altered their behavior and temporal patterns in a nuanced response to dispersed recreation, perhaps to decrease direct interactions with recreationists. However, at developed ski resorts, lynx appeared to spatially avoid the ski area, and to temporally adjust their activity to avoid high traffic times when they did go near it, even after controlling for differences between the ski area and its surroundings. On weekends, lynx use of ski areas increased with month as months became warmer and winter recreation declined, so that predicted use on June weekends was 4.7 times that of February weekends. The researchers concluded there may be a threshold of human disturbance above which lynx cannot coexist with winter recreation.

Therefore, we can expect that lynx may avoid and/or under-utilize the 430 acre area that is proposed for development in Hellroaring Basin, at least during winter. In the summer months, lynx use of the area may return to existing levels of use, as human disturbance in the Hellroaring Basin would be minimized (see project design features, and discussion of summer use of the Basin in the grizzly bear BO). During summer months, lynx would likely be able to forage on snowshoe hares within the remaining snowshoe hare habitat in Hellroaring Basin.

The lower elevations of Hellroaring Basin, where the existing Hell Fire Run and chairlift currently exist, would be abandoned, which would return over 300 acres of the lower portion of the ski area to very little recreation use. While the lack of disturbance in those lower elevations may be beneficial for lynx, much of the habitat in the lower elevations is currently composed of Stem Exclusion and “Other” Mature forest stands, which do not currently provide high quality foraging habitat for lynx, with some mature multistory foraging habitat interspersed. Therefore, the abandonment of the lower runs and lift would not, in the near future, provide a substantial offset of undisturbed high quality habitat for the disturbance that would occur to lynx habitat in the upper elevations.

The increased disturbance that could cause lynx to avoid or partially avoid up to 430 acres of the newly developed areas in Hellroaring Basin would result in a functional loss of those 430 acres (2% of the LAU), at least in the winter months when habitat is most limited (Squires et al. 2010). We do not expect that the development in Hellroaring Basin will result in an increase in out-of-area skiing that would substantially increase areas that lynx may avoid (A. Jacobs, personal

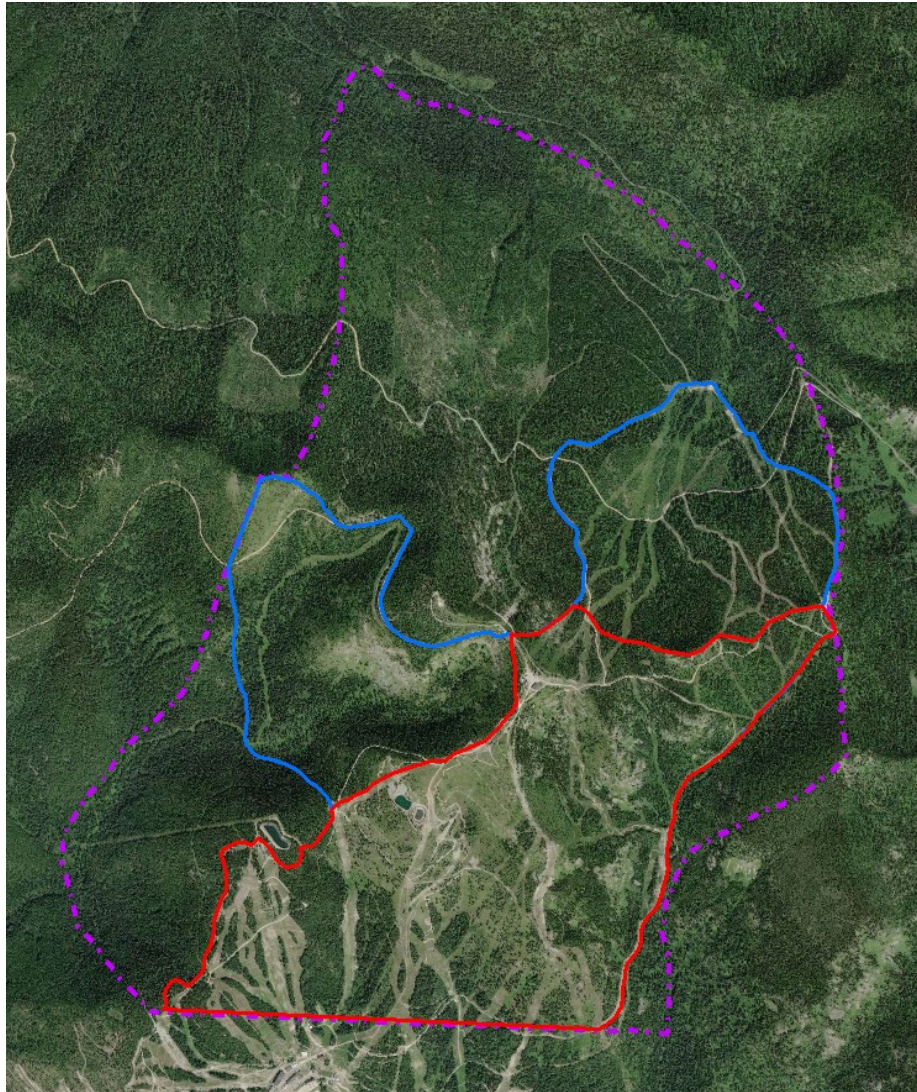
communication, August 2019). This 430 acres would be additive to the existing developed areas within the Whitefish Mountain Resort permit area. About 1/3 of the permit area (roughly 1,000 acres) will remain relatively undisturbed once the Hellroaring Basin Improvement Project is implemented (Figure 5). Thus, we estimate that the amount of area that is likely functionally unavailable for lynx, at least during the winter when intensive winter recreation occurs, would be about 1,630 acres once the Hellroaring Basin Improvement Project is implemented. Therefore, we assume that the proposed action would increase avoidance of 2% of the LAU, for a total of 10% of the LAU that is functionally unavailable for lynx during winter months.

An LAU approximates a home range for a female lynx, but may or may not actually constitute an actual home range. Lynx are highly territorial and defend their home ranges, while relying upon core use areas for the majority of their daily needs (Kosterman et al. 2018, Holbrook et al. 2019). If an individual lynx currently relies upon habitat in the Hellroaring Basin as part of its core use area, or if it regularly defends the Hellroaring Basin area, then the increased development and recreation could cause that individual to have to shift its use of resources, resulting in adverse effects to feeding, sheltering, and/or defense.

As discussed above, lynx foraging habitat is currently abundant and well-dispersed throughout the Lakalaho LAU. Winter foraging habitat in Stand Initiation and Multi-story mature forest stands comprises over 11,000 acres of the LAU, most of which is outside of the 3,100 acre permit area for the Whitefish Mountain Resort. Therefore, although lynx may avoid and thus experience a reduction in potential foraging within the additional 430 acres that would be developed under the proposed action, a substantial amount of other winter foraging habitat would still be available within the LAU for lynx to continue to use the LAU in winter, when food resources are most limited (Squires et al. 2010). Because conditions within the LAU are not currently limiting for lynx foraging, denning, or travel habitat, we do not expect the effects to rise to the level of abandonment of the LAU. However, any lynx that currently use could cause stress to the individual and a reduction in food resources. We do not know the effects that stress and reduction in the food resources would have on an individual. The individual may be able to quickly adjust, and learn to utilize other resources and areas within the LAU, or the individual may experience decreases in fitness or reproduction, at least until the adjustments are made.

We do not expect the effects of recreational use in the proposed Hellroaring Basin Improvement area to affect the putative corridor for connectivity of lynx that bisects the Lakalaho LAU. The corridor is roughly a mile to the north of Hellroaring Basin (Figure 5), and would not be directly affected by skiers in the Basin. Although development of Hellroaring Basin may lead to overall more skiers at Whitefish Mountain Resort overall, we do not expect that increase in skiers to affect the corridor, either, given the topography and the terrain that make it difficult to access the putative corridor area. Given the ability for lynx to move across the landscape, the unaffected area to the north of the permit area, the high amount and connectivity of mature forest that would remain in the LAU, and the genetic evidence showing high connectivity between lynx in western Montana and Canada (Schwartz et al. 2002), we expect the effects to lynx connectivity to be insignificant.

Figure 5. Classification of use areas for the Whitefish Mountain Resort permitted ski area. Purple dashed line shows the permit boundary. Red outline shows the highest-use area. Blue outlines show relatively lower use areas, including the existing developed north side of the mountain and the western Hellroaring Basin area proposed for development. The putative corridor for lynx follows the northernmost boundary of the permit area.



Effects of Road Construction and Use

Road and cat track construction effects on lynx habitat were expressed by linear distance passed through areas of habitat in the biological assessment (see Table 6 in USFS 2019). Up to 0.5 miles of multistory habitat and 1.0 miles of “Other” habitat would be affected, which at roughly 15 feet of clearing, which equals approximately 0.8 acres and 1.6 acres, respectively. Beyond

those insignificant effects to vegetation composition, no additional effects to lynx are expected due to road and cat track construction or use. Extensive (>600 km) backtracking studies found that lynx did not avoid gravel forest roads (Squires et al. 2010). Trails are typically narrow routes with a native surface; there is no information to suggest that trails have negative impacts on lynx. Thus we expect the insignificant overall effects to lynx from the construction and use of maintenance roads and the cat track.

Effects of Snow Compaction and Blasting

Use and grooming of the proposed ski runs, access roads, and cat track would compact snow. The best scientific information available concludes that coyotes do not require compacted snow routes to access winter snowshoe hare habitat (ILBT 2013), so increased competition with other predators is not likely. Currently there is no evidence that packed snow trails facilitated competition to a level that negatively affects lynx or lynx populations, and thus effects of snow compaction in terms of competition with other predators is discountable.

Some evidence from Colorado indicates a reduction in snowshoe hare use of inter-trail islands when snow is compacted by skiers (USFWS 2013). We have already established that we do not expect habitat within the developed portion of Hellroaring Basin to continue to provide foraging habitat for lynx, and thus those effects have already been considered above. Blasting for avalanche control may be one of the many factors that causes a lynx to avoid developed ski areas, although there is no direct data to support this theory. Because we already have considered the Hellroaring Basin developed area to be functionally lost in winter for lynx, any effects of blasting have already been considered above. We do not expect blasting or snow compaction to disturb lynx outside of the Hellroaring Basin Improvement Area (as shown in Figure 3).

D. Cumulative Effects to Lynx

The implementing regulations for section 7 define cumulative effects as “...those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation.” (50 CFR 402.02). 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. It is important to note that the section 7 definition (related to the Act) is not the same as the definition of “cumulative effects” under the National Environmental Policy Act.

Because the entire action area is managed by the Flathead National Forest, there are no cumulative effects anticipated within the action area. Future growth on private lands at or near Whitefish Mountain Resort is outside of the action area, but is a consideration for this project. With increased development and human use comes increased opportunities for habitat modifications and effects to connectivity for lynx. However, given the lower elevations of the private lands outside of the LAU at the base of the ski area, effects to lynx habitat are not anticipated.

F. Effects to Lynx Critical Habitat

PCE1a, the presence of snowshoe hares and their preferred habitat conditions, would be reduced by approximately 49 acres through vegetation removal for ski area development (42 acres of multistory and 7 acres of sapling hare habitat). Because these acres would no longer provide the potential for snowshoe hare habitat, and would be considered non-lynx habitat, this would be a conversion from PCE1a to PCE1d, matrix habitat. The reduction of PCE1a would be approximately 0.2% of the estimated PCE1a conditions in critical habitat in the Lakalaho LAU. Thus we expect adverse effects in terms of permanent removal of the 49 acres of PCE1a from the proposed action, but do not expect those effects to rise anywhere near the level of destruction or adverse modification of critical habitat at the scale of the critical habitat unit.

Up to 115 acres of newly compacted area would be created by grooming and skiing on runs and cat tracks. Other areas under lifts and in gladed areas could still have non-compacted snow in winter. Considering these acres in addition to those that already experience snow compaction due to developed ski runs and groomed snowmobile runs in the permit area and elsewhere in the LAU, the LAU will still mostly consist of areas with deep fluffy snow conditions in winter. Thus we expect insignificant effects to PCE1b.

PCE1c, denning habitat, would be reduced by approximately 64 acres by ski area development. Stand conditions with PCE1c attributes exist in both multistory forage and other (stem exclusion) habitats with high amounts of down woody debris. The reduction of PCE1c would be less than 0.4% of the estimated PCE1c in the Lakalaho LAU. Denning habitat is not limiting within this action area (U.S. Forest Service 2019). Project design features would retain down woody debris in some areas as well as larger diameter snags, retaining some denning structures useable for lynx denning. Thus we expect insignificant effects to PCE1c.

The project proposes 35 acres of vegetation treatment in matrix habitat (PCE1d). An additional 43 acres of matrix habitat would be created by permanent vegetation removal for ski runs and lift line clearing, all in thin linear shapes (discussed above). Lynx movement patterns through the developed ski area may change as a result of vegetation removal and recreation-related activities, but matrix habitat would continue to support the ability of lynx to travel within their home range. Avoidance of the developed ski area during high use times in winter would not substantially reduce the potential for lynx to move thru or between the LAU and other areas. Thus we expect insignificant effects to PCE1d.

In summary, although critical habitat elements would be altered thru the proposed action, the physical and biological features would not be altered to an extent that would appreciably reduce the conservation value of critical habitat for lynx. PCEs would continue to function at the scale of the Lakalaho LAU and across critical habitat Unit 3.

G. Cumulative Effects to Lynx Critical Habitat

The implementing regulations for section 7 define cumulative effects as "...those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation." (50 CFR 402.02).

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. It is important to note that the section 7 definition (related to the Act) is not the same as the definition of “cumulative effects” under the National Environmental Policy Act.

Because the entire action area (Lakalaho LAU) is managed by the Flathead National Forest, there are no cumulative effects anticipated within the action area. Future growth on private lands at or near Whitefish Mountain Resort is outside of the action area, but is a consideration for this project. With increased development and human use comes increased opportunities for habitat modifications and effects to connectivity for lynx. Given the lower elevations of the private lands outside of the LAU at the base of the ski area, and other areas that are effects to lynx habitat are not anticipated. However, some of the anticipated future development of private lands to the south of the LAU has the potential to affect the margins of lynx habitat or to affect connectivity to the south. Potential additive effects include habitat conversion and fragmentation, and reduced habitat effectiveness and habitat connectivity, and road kill. None of these effects are expected to greatly impair habitat effectiveness and habitat connectivity and or the ability of the Lakalaho LAU to support a lynx home range.

H. Conclusion for Lynx and Lynx Critical Habitat

Lynx

After reviewing the current status of the Canada lynx, 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 proposed Hellroaring Basin Improvements Project are not likely to jeopardize the continued existence of the Canada lynx. Regulations implementing section 7 of the Act 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 survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.” (50 CFR 402.02). The best information suggests that implementation of the Hellroaring Basin Improvements Project would not appreciably reduce the likelihood of survival and recovery of Canada lynx. Our conclusion is based on the literature and information referenced in this document, meetings and discussions with FNF, discussions with Canada lynx experts, the information in the biological assessment (USFS 2019), and information in our files.

Adverse effects are likely to a very few individual lynx from the permanent removal of 43 acres of habitat, and the functional loss of the 430 acre area to be developed in Hellroaring Basin. However, the scale of the proposed action is small within the context of an individual lynx home range (represented by the LAU). Because the rest of the LAU is in good condition with high amounts and connectivity of lynx habitat and low amounts of disturbance, the LAU should be able to support and sustain the ability for an individual lynx or pair of lynx (given that male home ranges often overlap female home ranges; Vashon et al. 2007, Olson et al. 2018).

We find that the proposed action may result in adverse effects to individual lynx within the 430 acre development area in Hellroaring Basin in the Lakalaho LAU. We have examined the impacts of the proposed action on individual lynx within the action area. We conclude that the proposed action would not appreciably reduce the numbers or distribution of lynx on the Flathead National Forest or the Northern Rocky Mountains Region (Unit 3) of the DPS. 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 existing of the contiguous United States Canada lynx DPS.

Our conclusion is based primarily on the information presented in the biological assessment and biological opinion on the effects of the Revised Forest Plan on lynx critical habitat (USFS 2017, USFWS 2017), which set the context for the entire Flathead National Forest. This project meets all of the standards and guidelines of the Revised Forest Plan. We also based our conclusion on information provided in the biological assessment for the proposed action (USFS 2019), information in our files, and informal discussions between the Service, the Forest, and other experts. We conclude that the Hellroaring Basin Improvement Project is not reasonably expected to reduce appreciably the likelihood of both the survival and recovery of lynx populations in the wild. Our rationale for the conclusion is based on, but not limited to the following factors summarized below, as detailed earlier in this biological opinion:

- The proposed project would result in permanent loss of 43 acres of lynx habitat due to the creation of cleared areas for ski runs and lift corridors.
- We anticipate lynx will avoid or partially avoid the 430 acres to be developed in the upper elevations of Hellroaring Basin, particularly in winter when skier use is highest.
- The amount of lynx habitat remaining in the Lakalaho LAU would be abundant and well-distributed throughout the rest of the LAU, and the current structural stage composition provides ample winter foraging opportunities for lynx.
- The project would not alter physical or biological features that would appreciably reduce the conservation value of the Lakalaho LAU for lynx, including the use of the LAU for a home range for an individual lynx.
- The project would not hinder connectivity along the mapped putative connectivity corridor to the north of the ski area.
- Habitat for lynx would remain abundant and well distributed across the project LAU and across the Flathead National Forest before, during, and after implementation.

Lynx Critical Habitat

After reviewing the current status of designated lynx critical habitat, 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 proposed Hellroaring Basin Improvement Project 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” (50 C.F.R. § 402.02). 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 and 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 Hellroaring Basin Improvement Project will not preclude continued adequate amounts of snowshoe hare habitat needed to sustain lynx in the LAUs within the action area and thus, critical habitat in the LAUs would remain functional. When added to the status of the critical habitat units, the effects of the proposed action are such that the conservation role of 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 Hellroaring Basin Improvement Project may result in some level of adverse effects to lynx critical habitat, the level of adverse effects are not reasonably expected to alter the physical and biological features to an extent that appreciably reduces the conservation value of critical habitat for the lynx DPS.

Our conclusion is based primarily on the information presented in the biological assessment and biological opinion on the effects of the Revised Forest Plan on lynx critical habitat (USFS 2017, USFWS 2017), which set the context for the entire Flathead National Forest. This project meets all of the standards and guidelines of the Revised Forest Plan. We also based our conclusion on information provided in the biological assessment for the proposed action (USFS 2019), information in our files, and informal discussions between the Service, the Forest, and other personnel. Our rationale for the no destruction or adverse modification conclusion is based on, but not limited to the following factors summarized below, as detailed earlier in this biological opinion.

- As described in our biological opinion, we anticipate adverse effects to lynx critical habitat from those actions that occur within snowshoe hare habitat and impact PCE1a within the action area. The proposed project would decrease snowshoe hare habitat (PCE1a) in designated lynx habitat and in Canada lynx critical habitat by 49 acres (0.2% of PCE 1a in the LAU).
- PCE1b (deep fluffy snows) would not be adversely affected by this proposal. All proposed activities would occur inside the Resort’s existing permit area, which concentrates activities in existing developed areas.
- The proposed project would decrease lynx denning habitat (PCE1c) by 35 acres. Denning habitat is not a limiting factor in the Lakalaho LAU.

- PCE1d (matrix habitat) would increase by 43 acres. PCE1d (matrix habitat) would continue to support the ability of lynx to travel within and between LAUs and other parts of the Critical Habitat Unit.
- The project would not alter physical or biological features that would appreciably reduce the conservation value of critical habitat for lynx.
- All PCEs would remain abundant and well distributed across the project LAU and across Critical Habitat Unit 3 before, during, and after implementation.

I. Incidental Take Statement for Canada Lynx

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as an intentional or negligent act or omission which creates the likelihood of injury to 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 ESA provided that such taking is in compliance with the terms and conditions of an incidental take statement.

In general, an incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize the impacts of the take and sets forth terms and conditions which must be complied with in order to implement the reasonable and prudent measures.

Amount or Extent of Take Anticipated

The existing Forest plans and policies, combined with the proposed conservation measures of the Hellroaring Basin Improvement Project, would remove the risk of direct take (i.e. mortality) of lynx. Based upon the scientific information available on the effects of disturbance on lynx, it is the biological opinion of the Service that the potential displacement of lynx from portions of the action area is likely to affect very few adult female lynx attempting to use this area and could result in some impairment of feeding and/or breeding. However, there is no scientific or commercial information available as to the numbers of females whose home range involves the action area. The extent of the Lakalaho LAU represents a potential single female adult lynx home range, which may also be occupied by an adult male. Some changes in feeding and behavioral patterns of individual lynx are likely to occur due to the direct habitat loss and indirect effects of the proposed action (functional habitat loss thru skier use and subsequent lynx avoidance). These changes could harm a very few individual lynx in terms of failure to obtain adequate food resources, impair an individual's normal reproductive potential or decrease

resiliency to other stressors, at least in the short-term (one to a few years) while the individual learns to adapt and respond to the changes in its home range. Due to the current and future anticipated condition of the LAU, in which lynx habitat is abundant and well-dispersed, the direct habitat loss and indirect effects of the proposed action is unlikely to result in significant impairment that would rise to the level of mortality or home range abandonment for an individual in the action area.

The Service anticipates that incidental take of lynx will be difficult to quantify and detect for the following reasons:

- Lynx are wide-ranging and not easily detected in the wild.
- Although we have a general understanding of where lynx population centers are within the action area, the distribution of individual lynx across the Flathead National Forest or at smaller scales within the action area is not known.
- Information required to accurately quantify snowshoe hare and alternate prey needed for the survival of adult lynx or kittens is not available.
- 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.
- Thus, we lack information to predict with precision the densities of hares in various habitat and forest stands within the home range of individual females, before and after specific treatments.
- Discovery or detection of lynx injury or mortality attributed to habitat alteration is very unlikely.

In addition to the difficulties outlined above, to capture and collar any lynx that occur within the Lakalaho LAU to monitor behavior pre- and post- development would be difficult, very expensive, and lead to a small sample size (one to a few individuals), from which very little scientifically valid information could be gained. For these reasons, direct monitoring is not practical or reasonable.

In cases such as these, Service policy, as stated in the Endangered Species Consultation Handbook (USFWS and NMFS 1998) (Handbook), is to provide some detectable measure of effect, 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.

The number of lynx that use the action area is unknown but is expected to be low since lynx occur at relatively low densities across the landscape and are territorial with non-overlapping territories within the sexes. Therefore, the Service anticipates only a low level of incidental take of lynx would occur in the form of harm from Hellroaring Basin Improvement project-related activities. Because of the difficulty of estimating the precise number of lynx that would experience take in the manner described above, we have developed surrogate measures to estimate the amount of anticipated take:

- the number of acres of lynx habitat permanently converted into non-lynx habitat (43 acres);
- the total area of new development within the permit area as a surrogate measures of the anticipated incidental take of lynx (430 acres).

If activities associated with the Hellroaring Basin Improvement Project result in effects that exceed the spatial and temporal surrogate measures above, then the level of incidental take we anticipated in this biological opinion would be exceeded and therefore the level of take exempted would be exceeded. Under CFR 402.16 (1), if any of the above scenarios occur, reinitiation of formal 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 would likely be to just one or a few individual lynx, and is not expected to result in mortality of any lynx. Rather, some low level of effect on the normal behavior and use of the area could be expected, which could have minor effects to reproductive potential and/or feeding patterns of individual lynx in the area. The best information indicates the overall status of lynx distribution and abundance in the contiguous United States Distinct Population Segment (DPS) is not substantially reduced from historical conditions (U.S. Fish and Wildlife Service 2018). Impacts on the lynx population, including anticipated levels of incidental take as a result of the Hellroaring Basin Improvements project, will not appreciably reduce survival or the recovery of the species. Further, considering the lynx conservation and protection strategies in the Flathead

National Forest Plan and other Federal land management plans throughout the DPS, incidental take of lynx in the action area would not affect the recovery of the DPS.

Reasonable and Prudent Measures

The Service has not identified any reasonable and prudent measures necessary and appropriate to minimize impacts of incidental take of lynx beyond what is included in the proposed action.

Terms and Conditions

Because no Reasonable and Prudent Measures have been identified for Canada lynx, there are no Terms and Conditions to implement with the proposed action.

Closing Statement

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 Incidental Take Statement, and possible addition of 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.

In this biological opinion, the Service relied on best available scientific information to assess effects of developed ski areas on lynx. This information came from research on lynx in Colorado, at and near at least one ski area that is comparable in size to Whitefish Mountain Resort (WMR), but where annual use of the ski area may be greater than at WMR. The Service encourages the Forest to develop monitoring strategies to assess applicability of the scientific conclusions from Colorado to the Hellroaring Basin area.

Because capture, collaring, and monitoring individual lynx is expensive and logistically difficult, the Forest could develop other measures of habitat quality to assess. For example, the Forest could monitor snowshoe hare use (using pellet counts or other indices) within islands of multistoried lynx habitat at Whitefish Mountain Resort. Comparing these densities to those outside of the permitted ski area could allow the Forest and the Service to better understand whether hare densities are affected by the fragmentation of habitat and/or skier use of the area.

Monitoring skier use of edges and fringe areas would help determine whether the increased infrastructure leads to an increase in out-of-area skiing.

Reinitiation Notice

This concludes consultation on the action outlined in your requests for consultation on the effects of the Hellroaring Basin Improvement Project on Canada lynx, and designated lynx critical habitat. As provided in 50 C.F.R. § 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Thank you for your continued assistance in the conservation of endangered, threatened, and proposed species. If you have any questions or comments on this biological opinion, please contact Carly Lewis, USFS/USFWS Liaison, at (406)329-3091 or carly.lewis@usda.gov.

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