South Plateau Landscape Area Treatment Project

Wildlife Report

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1 Introduction

The purpose of this report is to provide an analysis of anticipated effects of the South Plateau (SPLAT) Project on wildlife resources. It also serves as the Biological Evaluation for the project, as required in Forest Service Manual 2672.4 (USDA Forest Service 2002). Figure 1 displays the Project Area for the South Plateau Project Area. The Project area lies within the Madison, Henrys Lake, and Gallatin Mountains Geographic Area (Custer Gallatin Forest Plan, USDA 2022).While management areas no longer exist under the 2022 Forest Plan, the Project Area includes the Black Sands Springs Special Area, Whiskey Springs Municipal Watershed, and a portion of the Hebgen Winter Recreation Emphasis Area.

The purpose and need of the SPLAT Project is to:

- Increase resistance to natural disturbances in the suitable timber base, in particular mountain pine beetle and dwarf mistletoe impacts (FW-DC-TIM-02). Current conditions inthe South Plateau show an extremely high risk of a high-severity mountain pine beetle outbreak. The project area also has high levels of lodgepole pine dwarf mistletoe infections which causes physiological stress, growth loss, general decline, and potential mortality in host trees.

- Promote vegetation conditions that support natural fire regimes except in the wildland-urban interface and adjacent to infrastructure where vegetation conditions support low-intensity fire where necessary in order to reduce negative impacts to values at risk (FW-DC-FIRE-02). Current fuels conditions indicate large areas of crown fire and high intensity surface fire which will limit safe and effective suppression action near numerous values at risk including municipal watershed, private lands, numerous structures, critical infrastructure, and ecosystem concerns. Nearly all the values at risk (with the exception of ecosystem values) are likely to be negatively impacted by fire at any fire intensity level.

- Achieve timber production and harvests that contribute to ecological sustainability and ecological integrity while contributing to economic sustainability, providing jobs, and income to local economies (FW-DC-TIM-03). Currently, the only forest products being produced from this landscape are for personal use providing no direct benefit to local economies as selling these products is prohibited under the personal use permit.

- Maintain or create habitat conditions that contribute to the recovery of listed species by improving the condition of secure habitat in Bear Management Subunits identified as needing improvement (FW-DC-WL-02 and FW-DC-WLGB-01). Current conditions for secure habitat are in need of improvement in the Henry's Lake #2 and Madison#2 Subunits.

The Proposed Action for the South Plateau Project includes a number of potential activities. Table 1 provides a summary of the potential activities and the amount of area that would be affected by each activity. (**Note: The maximum treatment extent for the project is 16,462 acres; analysis was based on the 19,696 acres preliminarily identified as suitable for treatment or "stand pool".)** Table 1 also provides the amount of temporary road that would be constructed under the Proposed Action. Figure 2 displays the Proposed Action by treatment type for the current stand pool. The stand pool and individual unit boundaries will be refined further during layout; the units and acreage displayed in Figure 2 and the table below represent a maximum amount of treatment that would be refined during layout to meet design features (listed in Appendix B of the Environmental Assessment, also known as "sideboards"), and other requirements.

The "stand pool"

Up to 56.8 miles of temporary road would be constructed under the Proposed Action to access all the proposed treatment units in the current stand pool. The mileage of temporary road proposed for construction is based on the most current information available – it represents a combination of field verified temporary routes and proposed temporary routes identified using GIS and other methods. This set of temporary routes is generally considered the "worst case" scenario, or the maximum mileage of temporary routes that would be constructed under the project. Because sideboards (including Conservation Strategy and Forest Plan standards for projects that temporarily reduce secure habitat below baseline levels), design features, and other factors would reduce the amount of treatment that would occur in the project area, the actual mileage of temporary roads constructed is expected to be lower than this maximum level.

Worst case

Table 1: Summary of Activities and Acreage under the Proposed Action

Action	Proposed Action
Total Treatment	16,462 acres
Commercial Thinning	5,793 acres
Non-commercial Thinning	2,514 acres
Clearcut Harvest	5,551 acres*
Fuels Treatment	1,048 acres
Douglas-fir Thinning	800 acres
Burning	594 acres
Aspen Enhancement	162 acres
Temporary Road	56.8 miles

** While 8,787 acres were identified as suitable for clearcut in areas preliminarily identified as suitable for treatment (or in the stand pool), clearcut harvest would be limited to 5,551 acres by design features. This includes a maximum of 4,600 acres in lynx habitat and approximately 951 acres outside of lynx habitat.

Making clear 4,600 acres is not the limit

The SPLAT Project was designed, in part, to benefit wildlife resources. Specifically, the components of this project that address wildlife include the following:

- Identify opportunitities to maintain or enhance the value of unique habitats for wildlife and increase their persistence on the landscape. Specifically, opportunities to enhance aspen and whitebark pine stands would be considered where these habitats are encountered.

- Identify opportunities to maintain or improve the condition of lynx habitat in the project area. Where feasible and where fuels concerns are addressed, seek out opportunities to enhance future snowshoe hare foraging habitat in stands that are not currently providing sufficient horizontal cover to support primary lynx prey (i.e. thinning in stem exclusion stands to encourage understory development and multistory conditions). Look for opportunities to maintain existing patches of multistory lynx habitat and their connectivity where compatible with fuels management goals and where alternative opportunities are present.

- Identify opportunities to reduce disturbance impacts and sedimentation in streams in the project area. The lower portion (about 2.7 miles) of the South Fork Madison River Road (478) has been identified as a source of sediment to the South Fork Madison River. The road is also situated in the riparian area where a number of species, including grizzly bears, moose, and elk congregate due to the availability of water and green forage. The SPLAT Project would close and decommission a segment of the South Fork Madison River Road (478) and open a portion (about 3.6 miles) of two administrative roads (1704 and 6786) in the uplands to provide continued public access. These changes would result in increased secure habitat for grizzly bears in the Henry's Lake #2 and Madison #2 Bear Management Subunits. The1752 road (about 0.3 miles), which is

currently open to the public, would be closed to the public, but would remain open for periodic administrative use. Three additional administrative roads (1704B, 2543A, and 2543B, which total about 5.5 miles) in the Henry's Lake #2 Bear Management Subunit would be decommissioned to improve secure habitat conditions in this Subunit. These changes would result in a ned reduction of 8.2 miles of road available for administrative or public motorized use.

The Forest also proposes to update the Motor Vehicle Use Map to correct an inconsistency found during reconnaissance. It was found that road 1756 (designated seasonally open in the Travel Plan and the GYE Access database) was not drivable and that the 1756-N (no designation in the Travel Plan and "decommissioned" in the GYE Access database) was being used by the public as the open route. Under this project this inconsistency would be corrected – the currently used road segments would be adopted in both the Travel Plan and grizzly bear access database. The 1756-N would be the open route, the 1756 would be fully decommissioned, and a portion of the mis-mapped 1756 designated an administrative route to maintain connection to the 1757 road, which is also an administrative route. Road 1756-N will be open to all wheeled vehicles with a seasonal designation of 06/16 to 12/01. The overall impact of this correction would be a reduction in routes open to administrative or public use of 0.28 miles when compared to the current designations.

Table 2 lists the components of the project specifically proposed to benefit wildlife resources. While only some of the proposed action was proposed to benefit wildlife resources, all components of the proposed action were included in this analysis, as all components have the potential to affect wildlife resources.

Table 2: Wildlife-specific action in the South Plateau Project.

Action	Primary Objective
Decomission Admin Roads 1704B, 2543A, 2543B	Improve Grizzly Bear Secure Habitat

The Custer Gallatin Land Management Plan (USDA 2022) was developed under the 2012 Planning Rule (36 CFR Part 219). The 2012 Planning Rule calls for the use of a coarse-filter/fine-filter management approach to provide for the persistence of all native species (within Forest Service authority and the inherent capability of the land) in the plan area (i.e. the Forest scale). Coarse-filter plan components are designed to provide for the maintenance and restoration of the ecological integrity and diversity of ecosystems in the plan area. By providing for ecological integrity and diversity, the plan will support the long-term persistence of most native species (those that are common and secure). Fine-filter provisions are intended to provide protections for those species whose specific habitat needs or other requirements may not be fully met through implementation of coarse-filter plan components. The 2012 Planning Rule adopts a complementary ecosystem and species-specific approach, also known as a coarse-filter or fine-filter approach, to provide for the diversity of plant and animal communities and the long-term persistence of native species in the plan area. The ecosystem plan components are designed to maintain or restore ecological conditions for ecosystem integrity and plant and animal diversity on the Custer Gallatin. Species-specific plan components are designed to provide for additional specific habitat needs for native animal species when those needs are not met through the ecosystem plan components. Since habitat for wildlife is composed of both physiological and biological conditions on the landscape, most of the ecosystem plan components that benefit wildlife are found throughout the "ecosystems" section of the plan, under headings for air quality, soils, watershed, aquatic, riparian, and terrestrial vegetation. Species-specific components are included in the wildlife section to address factors that affect the animals

themselves, or to address specific habitat conditions that may not fall within the ecosystem considerations.

The 2012 Planning Rule requires the development of coarse-filter plan components and fine-filter plan components (where necessary) to provide the conditions necessary to maintain viable populations of Species of Conservation Concern within the plan area, or to contribute to maintaining a viable population of a Species of Conservation Concern across its range where outside the Agency's authority or beyond the inherent ecological capability of the plan area. Species of Conservation Concern are those plant and animal species that are known to occur in the plan area that the Regional Forester has, through the use of the best available scientific information, identified a substantial concern about the species' capability to persist over the long term in the plan area. Species of Conservation Concern are thus similar to Regional Forester's Sensitive Species. Under the 2012 Planning Rule there is no requirement for the designation of either Regional Forester's Sensitive Species (RFSS) or Management Indicator Species (MIS). As a result, there is no longer specific analysis of RFSS or MIS in this document, as these designations no longer exist. Effects to species previously identified as RFSS or MIS, such as Rocky Mountain elk, may be analyzed, where necessary, to assess project compliance with course and fine-filter components of the 2021 Forest Plan. Effects to former RFSS and MIS may also be considered in the Migratory Bird Species of Concern section of this document. Emphasis on species of conservation concern is more focused than the viability provisions under the1982 rule (''provide for adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species,''), which included all vertebrate species whether there was concern about their persistence in the plan area or not.

Wildlife resources analyzed in this report included federally listed species (including Proposed and Candidate species), Custer Gallatin National Forest Species of Conservation Concern (Marten 2021), migratory bird Species of Concern (SOC), and Birds of Conservation Concern (BCC, USDI 2021). Species analyzed in this report are listed in Table 3 along with their status and determination of effects, where appropriate.

Table 3: List of species considered for analysis.

Status	Species Common Name	Species Scientific Name	Effects Determination
Federally Listed- Threatened	Canada lynx	*Lynx canadensis*	May affect, likely to adversely affect
Federally Listed- Threatened	Grizzly bear	*Ursus arctos horribilis*	May affect, likely to adversely affect
Proposed for Federal Listing	North American wolverine	*Gulo gulo luscus*	Not likely to jeopardize the continued existence of the species
Custer Gallatin National Forest Species of Conservation Concern	Greater sage-grouse	*Centrocercus urophasianus*	No impact
Custer Gallatin National Forest Species of Conservation Concern	White-tailed prairie dog	*Cynomys leucurus*	No impact
Species of Interest with No Special Designation	Big Game (elk, moose, deer)	*Cervus canadensis, Alces alces, and Odocoileus hemionus*	n/a
Species of Interest with No Special Designation	Bald eagle[1]	*Haliaeetus leucocephalus*	n/a
Migratory Bird Species of Concern[3]	Brown creeper	*Certhia americana*	n/a
Migratory Bird Species of Concern	Cassin's finch	*Haemorhous cassinii*	n/a
Migratory Bird Species of Concern	Clark's nutcracker	*Nucifraga columbiana*	n/a
Migratory Bird Species of Concern	Evening grosbeak	*Coccothraustes vespertinus*	n/a
Migratory Bird Species of Concern	Great gray owl	*Strix nebulosi*	n/a
Migratory Bird Species of Concern	Calliope hummingbird	*Selasphorus calliope*	n/a
Migratory Bird Species of Concern	Williamson's sapsucker	*Sphyrapicus thyroideus*	n/a
Migratory Bird Species of Concern	Olive-sided flycatcher	*Contopus cooperi*	n/a
Migratory Bird Species of Concern	Pacific wren	*Troglodytes pacificus*	n/a
Migratory Bird Species of Concern	Rufous hummingbird	*Selasphorus rufus*	n/a
Migratory Bird Species of Concern	Broad-tailed hummingbird	*Selasphorus platycercus*	n/a
Migratory Bird Species of Concern	Veery	*Catharus fuscescens*	n/a
Migratory Bird Species of Concern	Northern goshawk[2]	*Accipiter gentilis*	n/a
Migratory Bird Species of Concern	Black-backed woodpecker[1]	*Picoides arcticus*	n/a

[1] Formerly RFSS on Gallatin NF
[2]Formerly MIS on Gallatin NF
[3]Includes Montana State Species of Concern and Birds of Conservation Concern with a potential to occur in the project area.

2 Regulatory Framework

This section discusses the regulatory framework for wildlife management on the Custer Gallatin National Forest (CGNF).

2.1 Custer Gallatin National Forest Land and Resource Management Plan (2021)

The Custer Gallatin National Forest (CGNF) Land Management Plan (hereinafter referred to as the Forest Plan or FP) guides all natural resource management activities and establishes management standards for the CGNF. It describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management. The FP provides management direction through goals, objective, standards, and guidelines that apply either at the Forest-wide level, or that are applicable to different geographic areas. Geographic areas are smaller components of the Forest that have their own distinctive roles and contributions and that have their own unique management desired conditions, standards, and objectives. The proposed treatments lay entirely within the Madison, Henry's Lake, and Gallatin Mountains geographic area (Figure 1).

A *goal* is a statement describing desired results and/or conditions in general terms (USDA Forest Service 2015b). No time period for achievement is specified. Goals are listed to identify the overriding purpose of more specific objectives, standards, and guidelines designed to maintain or improve environmental conditions. *Objectives* are brief summaries of how the various resources and activities will be managed under the FP (USDA Forest Service 2015b). *Standards* are binding limitations placed on management activities, not already covered by law or regulation, that are designed to maintain a specified minimum level of resource protection (USDA Forest Service 2015b). Forest-wide standards are those that apply universally over most, if not all, of the Forest. *Guidelines* are defined in USDA Forest Service (2015b) as preferable or advisable limits placed on management activities. Guidelines are similar to standards except they are non-binding. If an action does not meet the letter of the guideline, they must must meet the intent of the guideline.

The previous version of the Forest Plan was amended over time, with the last time in 2015. While the previous version of the Plan (and its amendments) is no longer valid, several guiding documents, including the Northern Rockies Lynx Management Direction and the Conservation Strategy for Yellowstone Grizzly Bears were brought forward into the new plan and will be applied in the same fashion.

2.2 Federal Law

2.2.1 National Forest Management Act

The National Forest Management Act (NFMA) directs the Forest Service to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." [16 U.S.C. 1604(g)(3)(B)]. The 2012 planning rule (USDA Forest Service 2012) makes it clear that the intent of the NFMA requirement would be met at the planning unit scale through the implementation of the FP. The Forest Service meets this requirement by managing for the diversity of plant and animal communities and the long-term persistence of native species in the plan area. This project was designed under the direction of the FP and is in compliance with all FP direction and is, therefore, in compliance with the NFMA.

2.2.2 Endangered Species Act

The ESA of 1973 as amended, requires the Forest Service to insure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. It also requires the Forest Service to confer on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (USDI Fish and Wildlife Service 1973). Effects of the proposed alternatives on federally listed species are analyzed in this document, and consultation with USFWS will be completed once an alternative has been selected.

2.2.3 International Migratory Bird Treaty Act and Executive Order 13186

The IMBTA implements various treaties and conventions between the United States, Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. A migratory bird is any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle. Under the Act, it is unlawful to pursue, hunt, take, or capture a migratory bird except as permitted by regulation (16 U.S.C. 703-704). The regulations at 50 CFR 21.11 prohibit the take, possession, import, export, transport, sale, purchase, barter, or offering of these activities, or possessing migratory birds, including nests and eggs, except under a valid permit or as permitted in the implementing regulations.

Executive Order (EO) 13186 (66 Fed. Reg. 3853, January 17, 2001) clarified the responsibilities of federal agencies in providing for the conservation of migratory bird species under the IMBTA. This EO requires agencies to ensure that environmental analyses evaluate the effects of federal actions and agency plans on migratory birds, with emphasis on species of concern. The Forest Service is required to evaluate and balance the long-term benefits of projects against any short- or long-term adverse effects of actions, and to consider approaches for identifying and minimizing take that is incidental to otherwise lawful activities. This report considered effects of this action as required under the EO.

2.2.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

"Disturb" means: “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

Effects of the project on bald eagle were considered, and a design feature was included during project development to protect bald eagle nests (if found in the project area) and minimize potential disturbance in order to comply with the BGEPA.

2.3 Other Guidance

2.3.1 Grizzly Bear Conservation Strategy

The 1993 Grizzly Bear Recovery Plan called for development of a conservation strategy to outline habitat and population monitoring after recovery (USDI Fish and Wildlife Service 1993, pg. 16). To fulfill this obligation, the Interagency Conservation Strategy Team was formed in 1993, and the *Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area* (GBCS) was finalized in 2003 and updated in 2007 (Interagency Conservation Strategy Team 2007) and 2016 (ICST 2016). This document was designed to provide adequate regulatory mechanisms after delisting and ensure long-term maintenance of the recovered population (USDI Fish and Wildlife Service 2017, pg 30515). The GBCS is generally considered the best, most current reference with respect to grizzly bear management. Upon its finalization, the Forest Service signed an MOU agreeing to implement all aspects of the GBCS to maintain and enhance the recovered status of the grizzly bear (Interagency Conservation Strategy Team 2007). Guidance included in the GBCS was rolled into the 2022 Custer Gallatin Forest Plan; all habitat standards and application rules present in the previous Forest Plan are included in the 2022 Plan.

2.3.2 Montana Bald Eagle Management Guidelines: An addendum to Montana Bald Eagle Management Plan (1994)

This addendum was prepared in cooperation with the Montana Bald Eagle Working Group to address federal bald eagle regulations that were put in place after the bald eagle was delisted from the threatened and endangered species list. The guidance in this document (Montana Bald Eagle Working Group 2010) will be implemented in the event that a bald eagle nest is discovered in the Project Area (see project design features).

3 Project Design Features and Mitigation

3.1 Species-Specific Mitigation Measures

The following species-specific mitigation measures would be implemented to minimize effects on the identified species.

3.1.1 Grizzly Bear

To reduce impacts on grizzly bear, the following sideboards/design features will be implemented.

- No other projects that affect secure habitat below baseline levels will be implemented in the Madison #2, Henry's Lake #2, or Plateau #1 Bear Management Subunits (BMS) until this project has been completed (or those activities affecting secure habitat below baseline are completed and temporary roads effectively decommissioned to restore secure habitat to pre-implementation conditions).
- Use of project roads will be limited to administrative purposes associated with project activities.
- Project roads that affect secure habitat below baseline levels in the Madison #2, Henry's Lake #2, or Plateau #1 Subunits, collectively, will be available for project use for no longer than 3

consecutive years and then closed to all motorized travel. Project roads that affect secure habitat below baseline levels will be decommissioned such that secure habitat will be restored within one year after road closure. The total acreage of secure habitat affected within a Bear Management Unit will not exceed 1% of the acreage in the largest subunit within that Bear Management Unit.

- Any permanent changes in secure habitat must be replaced by creating secure habitat of equivalent habitat quality and quantity (through road/motorized trail closure and decommissioning) in the same Bear Management Subunit. For those Subunits in need of improvement (including Madison #2 and Henry's Lake #2), secure habitat, OMARD, or TMARD will meet or be better than the level under full implementation of the Gallatin Travel Plan.

- Use of temporary project roads (including temporary roads constructed for the project, restricted roads used exclusively for administrative use, decommissioned routes, etc.) would be limited to administrative purposes associated with project activities. No public motorized use of temporary or administrative roads would be allowed.

- Temporary project roads would be obliterated when no longer needed. This may include slashing, downed wood placement, ripping/subsoiling, etc. Utilize berms, kelly humps, and/or downed woody material to block and/or mask the location where these temporary routes meet routes that are open to public use. The goal is to make these routes not drivable to all motorized users.

3.1.2 Bald Eagle

Although no known nests are present, the following mitigation measures will be incorporated into the project to reduce impacts on bald eagle, in the event a nest is discovered:

- In the event a bald eagle nest is discovered in the Project Area, appropriate seasonal restrictions and distance buffers would be applied. The Montana Bald Eagle Management Guidelines (2010) would be consulted for appropriate protection measures.

3.1.3 Northern Goshawk

To reduce impacts on northern goshawk, the following mitigation measures will be implemented:

- No ground-disturbing activities may occur at any time of the year within 745 feet (~40-acre buffer) of an occupied nest. A nest is considered unoccupied when it has been monitored during the breeding season and determined to have been inactive every year for at least five years.

- No ground-disturbing activities will occur within an active post-fledging area (PFA) from 15 April to 15 August. An active PFA is one in which goshawks are exhibiting breeding behavior that year. The PFA will be determined by a FS biologist.

- Adapt thinning prescriptions in treatment units closest to known, occupied nest sites so that the proportion of closed canopy (> 50% canopy cover, > 5" diameter) habitat in an estimated goshawk home range is within the range of habitat conditions (37-69%) reported in the Northern Region Overview for goshawks (Brewer et al. 2009).

3.1.4 Big Game

To reduce potential impacts to big game the following mitigation measures will be implemented:

- To minimize disturbance of big game (elk, moose, and deer) on winter range during the winter when energy demands are high, management activities (vegetative treatment) would not occur in winter range (moose and elk) between December 1 and April 30.

- Retain patches of coniferous forest in moose winter range in the project area to provide snow interception, winter forage, and thermal regulation for wintering moose to address FW-GDL-WLBG-01. Patches of untreated forest should range from 0.5 acres up to 5 acres in size, with a preference for larger patches. Patches should be provided in mid-aged and older mixed conifer/subalpine fir/lodgepole pine stands that have multiple canopy layers and good levels of regeneration within 5 meters of the ground; these patches should be situated near riparian willow communities where possible to reduce energy expenditures when moose move between these two habitat types. Patches would be retained in appropriate conifer stands on at least 20% of proposed treatment acres. Patches should be situated in a manner that does not conflict with fuels reduction needs adjacent to private lands, strategic roads, or values at risk (at least 100-200 feet from these features).

3.1.5 Old Growth and Dead Wood

- Treatments in old growth stands must retain minimum old growth structure (Green et al. 1992) post-treatment. In warm dry broad potential vegetation types, treatments in old growth are limited to material less than 8” in diameter. In cool moist or cold broad potential vegetation types, treatments in old growth are not to occur except where they occur in areas of fuels concern such as private land boundary, strategic roads, or values at risk (infrastructure such as powerlines, structures, etc.). Where old growth is adjacent to these features, treatment would occur in the 100-200 feet adjacent to the boundary, strategic road, or value at risk. Type and extent of this treatment would be determined by the fuels specialist based on site specific conditions. Underburning is not permitted within old growth.

- A minimum of 10 tons/acre of Coarse Woody Debris (CWD) will be retained in vegetation management units after implementation. 15 tons/acre CWD is preferred. In units with insufficient projected post-implementation CWD, desired levels will be reached through backhauling material from landings, accounting for recruitment trees through the vegetation management prescription, and the option of recruitment tree felling and girdling in deficient units. The largest diameter material is preferred. Fuels, Wildlife, Silviculture, and Soil specialists will be consulted when backhauling or dropping trees in units post-implementation.

- Retain all snags >20 inches dbh in treatment units. When feasible (and where they do not pose a safety risk), protect these legacy large snags from operational removal, burning, and other activities.

4 Methodology

4.1 Project Area Boundary

The term “project area” is used in a variety of documents relevant to the South Plateau Project. For the purposes of this Wildlife Specialist report, the “project area” refers to the largest area that has the potential to be directly affected by proposed treatments. For this reason, the “project area” refers to the area encompassed by the Proposed Action unit boundaries. See Figure 1, which depicts the Proposed Action treatment boundaries, which defines the “project area” for this analysis. It should be noted that the Proposed Action treatment boundaries depicted in this Figure are the current pool of potential treatment

units. In order to meet project sideboards, design measures, and other requirements, treatment acres will be reuced during project layout to some degree. The current pool of potential treatments therefore represents a maximum number of acres that would be affected; the actual treatment is expected to impact fewer acres.

4.2 Information Sources

Data used for this analysis are listed in Table 4.

Table 4: Data sources used for the wildlife analyses

Data	Information
Motorized Access Model	Made available by Interagency Grizzly Bear Study Team (IGBST) database coordinator Lisa Landenburger. Contains most current road layer for the CGNF that is updated regularly to store motorized access values for every route on the Forest within bear management units. This data was updated to account for new methodology for secure habitat delineation ("footprint" methodology for some developed sites) – see grizzly bear section for explanation of this change.
R1vMap2015	The 2015 Region 1 (R1) VMAP product, developed by the Forest Service Region One Geospatial Services Group, was used to estimate vegetation conditions such as dominance type, canopy cover, and tree size class. The VMAP version utilized for this analysis was based on 2013 imagery. Documentation can be found at http://www.fs.usda.gov/detailfull/r1/landmanagement/gis/?cid=stelprdb5331054&width=full
Potential Vegetation Type (PVT)	PVT mapping units delineate areas having similar biophysical environments (e.g., similar climate and soil characteristics). PVT was modeled from spatially referenced field data having a reference to habitat type. Documentation can be found at http://www.fs.usda.gov/detailfull/r1/landmanagement/gis/?cid=stelprd3852570&width=full
FS Activity Tracking System (FACTS)	The Forest Service Activity Tracking System (FACTS) is an activity tracking system for all levels of the Forest Service. It supports timber sales in conjunction with TIM Contracts and Permits; tracks and monitors NEPA decisions; tracks KV trust fund plans at the timber sale level and reporting at the National level; and, it generates National, Regional, Forest, and/or District Reports. The database is accessible through an internal server.
Monitoring Trends in Burn Severity (MTBS)	Multi-year project led by USGS that was developed to consistently map the burn severity and perimeters of fires across the United States. More information can be found here: http://www.mtbs.gov/
FSVeg Spatial	Contains stand level data that have been collected over time using Forest Service stand exam protocols.

4.3 Effects of Alternative 1 (No Action)

Some of the effects of selecting the No Action Alternative are common to all analyses provided in this report. These effects are presented here and referred to later so as to avoid redundancy in each section.

Not implementing any of the proposed action could result in a variety of conditions on the landscape depending on the timing, intensity, and scale of disturbance events. These include the following:

- The Forest Service will continue to have an aggressive suppression response to wildfire, including in the South Plateau and Targhee Pass areas, which is likely to continue to exclude fire from the landscape.
- The potential for a large, uncontrolled fire event in the area south and west of the Town of West Yellowstone would not be reduced. Many factors associated with fire could influence resulting

vegetative composition and structure, including fire location, fire intensity, fire severity, tree species resistance, species adaptive traits, etc. These will not be discussed in detail due to the number of unknown factors and the fact that aggressive fire suppression is expected to continue under this alternative.

- As stated in the Forest Vegetation Specialist Report (Demastus 2022), it is expected that aspen would decline over time; as field observations indicate that conifer encroachment represents the greatest threat to aspen sustainability within the analysis area. Conifers can shade out aspen and severely limit the possibility of aspen suckering (Shepperd et al. 2006). Where aspen is replaced by conifer, conifer species (primarily Douglas-fir, lodgepole pine, and spruce) representation would increase. Aspen stands that are not experiencing encroachment by conifers but also not successfully regenerating would likely convert to grass/meadow lands. Browsing is unlikely to result in a species conversion. If experienced, drought could also contribute to reductions of aspen, as it has been found to be a major contributor to aspen decline, especially in drier regions (Worrall et al. 2013).

- As stated in the Forest Vegetation Specialist Report (Demastus 2022), continued susceptibility and mortality of host species from insect and disease pathogens is expected.

Effects of the No Action Alternative for each species or issue considered in this report will be considered under the context, then, that these stated effects may result.

5 Federally Listed Animal Species

Federally listed species are those species that are listed as endangered, threatened, or proposed under the ESA. A list of threatened, Endangered, and Proposed Species was requested for the project, and was accessed on and is dated June 8, 2022 (USDI 2022a). Two federally listed animal species may be present in the project area: grizzly bear and Canada lynx. One species proposed for federal listing under the ESA is present: North American wolverine. This section discusses potential effects of the project on these three species.

5.1 Grizzly Bear

5.1.1 Issue

Grizzly bear was listed as a threatened species under the ESA in 1975, mainly due to population declines caused by human activities resulting in mortality and displacement (Interagency Conservation Strategy Team 2007 pg. 39). Population recovery began in the 1980's, grew robustly in the 1990's, and has slowed since the early 2000's. The slowing of population growth is believed to be a density-dependent phenomenon, and may be indicating that grizzly bears are reaching some carrying capacity in the GYE (Interagency Grizzly Bear Study Team 2016 and van Manen et al. 2015). A proposed rule to remove the GYE population of the grizzly bear from the endangered species list was published in March 2016 (USDI 2016a). The Final Rule removing the Greater Yellowstone Ecosystem Population of Grizzly Bears from the Federal List of Endangered and Threatened Wildlife was published in the Federal Register on June 30, 2017 (82 FR 30502) and became effective on July 31, 2017 (USDI 2017). On September 24, 2018, US District Court Judge Dana Christensen vacated the June 30, 2017 Final Rule of the United States Fish and Wildlife Service delisting the Greater Yellowstone Ecosystem population of grizzly bears and restored Endangered Species Act status to the Greater Yellowstone grizzly bear population. In July 2020 the 9th Circuit affirmed the 2018 District Court ruling.

The grizzly bear was also identified in the FP Cleanup Amendment as a management indicator species (MIS) for threatened and endangered species (USDA Forest Service 2015a, pg. 31). Under the 2022 Forest Plan this designation no longer exists. Please refer to discussion of the 2022 Forest Plan above.

According to the GBCS, at minimum, grizzly bears need food, seasonal foraging habitat, denning habitat, and security in an area of sufficient size for survival. The project has the potential to affect these factors.

5.1.2 Resource Indicators and Measures

Because the project has the potential to affect the minimum survival requirements of grizzly bears (food, seasonal foraging habitat, denning habitat, and security), these were the resource indicators selected for this analysis.

There are no established thresholds for seasonal foraging habitat quality (measured by comparing expected effects of the project on ungulates, whitebark pine, aspen, riparian areas, alpine meadows, and forest understory vegetation) that the Forest uses as a target level for which to manage, and the FP does not contain any quantitative standards specific to these indicators. The conclusion of how changes in these indicators would affect grizzly bears was, therefore, qualitative in nature.

The scientific literature does not provide a threshold for the amount of denning habitat that is adequate for meeting grizzly bear survival needs. This analysis considers how the project may affect denning habitat, both quantitatively and spatially, and a determination of how those changes may affect grizzly bear survival based on the amount and spatial juxtaposition of denning habitat that would still be available following treatment.

Security for grizzly bears is often associated with the presence of roads, and reduction in security has been associated with increases in displacement and mortality risk for bears. Effects on security were, therefore, evaluated using indicators based on road density and placement. The measures used to quantify effects of roads on grizzly bear security, specifically, included the following:

- Grizzly Bear Secure Habitat – areas greater than 10 acres in size that are more than 500 meters from an open or gated motorized access route or reoccurring helicopter flight line. Secure habitat, for the purposes of this discussion, is one measure of overall security for grizzly bears.
- Total Motorized Access Route Density (TMARD) – proportion of a Subunit that exceeds 2 mi/mi^2 of open and restricted roads.
- Open Motorized Access Route Density (OMARD) – the proportion of a Subunit that exceeds 1 mi/mi^2 of open roads (those that are open to the general public during the period when bears are active).

The literature and the FP contain standards specific to management of grizzly bear secure habitat. The FP does not contain standards specific to management of TMARD or OMARD. The Amended Incidental Take Statement for the Gallatin National Forest Travel Plan (2006) states that the Forest shall follow access management as proposed under the Travel Plan (full implementation), including "meeting or being better than the OMARD, TMARD, and secure habitat resulting from full implementation as calculated by the updated ACCESS model" for those Subunits where incidental take is expected (USDI 2013). These include the Henry's #2 and Madison #2 Subunits, which were identified as Subunits in need of improvement, and that lie within the project area for the South Plateau Project. Term and Condition #2 in the Biological Opinion for the 2022 Forest Plan states that "Within the GYE recovery zone, the CG Forest shall meet or improve 1998 baseline levels of OMARD greater than 1.0 $mile/mile^2$ and TMARD greater

than 2.0 miles/mile^2. As the requirements of the 2013 Amended ITS are more restrictive (i.e. require meeting full travel plan implementation levels as opposed to improving upon the 1998 level), these levels will be considered in the effects analysis of OMARD and TMARD.

Table 5: Resource indicators and measures for assessing effects on grizzly bear.

Issue	Resource Indicator	Measure- No Action	Measure- Proposed Action	Used to adress P/N or key issue?	Source
Grizzly Bear Food and Seasonal Foraging Habitat	Effect on Ungulate Displacement	1) Ongoing Fire Suppression Leads to Long-Term Increase in Displacement; 2) Continued Insect/Disease Leads to Reduction in Displacement	1) Short Term Diplacement of Ungulates; 2) Long-term Benefit to Ungulates due to Increased Forage	No	Literature Review
Grizzly Bear Food and Seasonal Foraging Habitat	Effect on Whitebark Pine	1) Ongoing fire suppression leads to ongoing reduction; 2) Insect/disease increase leads to ongoing reduction in whitebark pine.	Up to 72 acres of whitebark pine enhanced	No	Literature Review
Grizzly Bear Food and Seasonal Foraging Habitat	Effect on Aspen	1) Ongoing fire suppression leads to ongoing reduction; 2) Insect/disease increase leads to enhancement over time.	Aspen enhancement in 162 acres. Additional aspen would be enhanced where encountered in proposed units.	No	Literature Review
Grizzly Bear Food and Seasonal Foraging Habitat	Effect on Riparian Areas	1) Ongoing fire suppression leads to ongoing reduction; 2) Insect/disease increase leads to improvement over time, depending on intensity and scale.	Structure and function protected through project design. Treatments may occur in riparian areas where they benefit riparian habitat conditions.	No	Literature Review
Grizzly Bear Food and Seasonal Foraging Habitat	Effect on Forest Understory Vegetation	1) Ongoing fire suppression leads to reduction over time; 2) Insect/disease increase leads to increase.	Up to 16,462 acres affected where understory production would increase.	No	Literature Review

Denning Habitat	Amount of Denning Habitat	1) Ongoing fire suppression is neutral; 2) Insect/disease increase leads to reduction.	1) Up to 6.7% of denning habitat in the analysis area affected; 2) Negligible temporary reduction relative to the scale of the subunits and availability of suitable denning habitat in the immediate vicinity.	No	Podruzny (2002)
Secure Habitat	Secure Habitat Reduction Below Baseline	No Change	**1) Plateau #1** – No reduction below 1998 baseline. 1.3% temporary reduction from existing condition. **2) Madison #2** – There would be a temporary 0.3% reduction from the existing condition and a 0.3% temporary reduction in secure below baseline (0.2% reduction below baseline relative to the acreage of the largest Subunit in the BMU). **3) Henry's #2** – There would be a temporary 2.7% reduction from the existing condition and below baseline. This a 1.9% reduction below baseline relative to the acreage of the largest Subunit in the BMU, although sideboards would limit this impact to no greater than 1% at any point in time. **4) Permanent Increase-** There would be a permanent 1.2% (+1,109 acres) increase in secure habitat in the Henry's Lake #2 Subunit and a slight (.0171% or 16 acre) permanent increase in secure habitat in the Madison #2 Subunit through decommissioning of a portion of the South Madison River Road (currently open to the public), opening a portion of the Courrett Ridge Road to the public (currently open for Administrative use only), and decommissioning of the 1704B, 2543A, and 2543B (currently all open to Administrative use only). **5) Complies with FP.**	No	2022 Custer Gallatin Forest Plan

Total Motorized Access Road Density	Change in TMARD from 1998 level (Full Travel Plan Implementation for Henry's #2 and Madison #2)	No Change	TMARD would temporarily increase in all three Subunits (from 0.5% to 5.7% if all treatment and temporary roads were implemented at the same time, which they would not) due to temporary road impacts. Decommissioning a portion Road 478 (currently open to the public), opening of a portion of the 1704 and 6786 Roads to the public (currently Admin use only), closing Rd 1752 to public access (currently open to the public), and decommissioning of Roads 1704B, 2543A, and 2543B (currently Admin use only) would: **1)** Permamently decrease TMARD in the Henry's Lake #2 Subunit 2% (from 28.1% to 26.1%); **2)** Maintain existing TMARD levels in the Madison #2 (a very slight decrease) and Plateau #1 Subunits.	No	Interagency Grizzly Bear Committee 2016 and 2013 Amended ITS for the Gallatin Travel Plan
Open Motorized Access Road Density	Change in OMARD from 1998 level (Full Travel Plan Implementation for Henry's #2 and Madison #2)	No Change	Decommissioning a portion of Road 478 (currently open to the public), opening a portion of Roads 1704 and 6786 to the public (currently admin use only), and closing Rd 1752 to public access (currently open to the public) would: **1)** Permanently increase OMARD in the Henry's Lake #2 Subunit 0.7% (from 40.6% to 41.3%); OMARD would meet the full Travel Plan implementation level (41.3%); **2)** Permanently decrease OMARD in the Madison #2 Subunit 0.3% (from 32.0% to 31.7%). The full Travel Plan implementation level for the Madison #2 Subunit is 32.0%; **3)** Have no impact on the existing level of OMARD in the Plateau #1 Subunit.	No	Interagency Grizzly Bear Committee 2016 and 2013 Amended ITS for the Gallatin Travel Plan

5.1.3 Methodology and Information Sources

5.1.3.1 Spatial and Temporal Context for Effects Analysis

The project is located within the Greater Yellowstone Ecosystem (GYE) Grizzly Bear Recovery Zone. The GYE Recovery Zone is divided into bear management units (BMUs) for habitat evaluation and population monitoring (USDI Fish and Wildlife Service 1993 pg. 17). Bear Management Units (BMUs) are further subdivided into Subunits to allow better resolution of habitat measurement (Interagency Conservation Strategy Team 2016). BMUs approximate the lifetime size of a female's home range, while subunits approximate the annual home range of adult females (USDI Fish and Wildlife Service 2017 pg. 30509). Subunits provide the optimal scale for evaluation of seasonal feeding opportunities and landscape patterns of food availability for grizzly bears (USDI Fish and Wildlife Service 2017 pg. 30509). The bear management units and subunits were identified to ensure that habitat for grizzly bears is well distributed across the recovery area (Interagency Conservation Strategy Team 2016 pg. 22). The project area lies within the Madison #2, Henry's #2, and Plateau #1 Subunits (Figure 3, Table 6). Because Subunits provide the optimal scale for evaluating seasonal feeding opportunities and landscape patterns of food availability, the spatial boundary for analyzing the effects to grizzly bear is the area that consists of the three Subunits that are intersected by the project area: the Madison #2, Henry's #2, and Plateau #1 Subunits.

Effects of the project on grizzly bear are expected to be measurable from project initiation to as long as 20 years after project completion. It will take at least this amount of time for existing whitebark pine regeneration that may be present to reach cone-bearing age (refer to Vegetation Report). Responses in understory vegetation would require less time to occur. The temporal bounds for the grizzly bear analysis were, therefore, the time from the present until 20 years after completion.

Table 6: Subunits that make up the grizzly bear analysis area and their size in acres (excluding lakes).

Bear Management Subunit	Acres
Henry's Lake #2	89,754
Madison #2	95,630
Plateau #1	183,214

5.1.3.2 Methods Used for Analysis

5.1.3.2.1 Food and seasonal foraging habitat quality

Anticipated effects of the Proposed Action on aspen and whitebark pine is provided in the Forest Vegetation Specialist Report (Nosal and Demastus 2022). Pertinent literature was also reviewed to evaluate possible impacts associated with the proposed action alternatives and their consequences on grizzly bear food sources and foraging habitat.

5.1.3.2.2 Denning habitat

Podruzny (2002) modeled suitable grizzly bear denning habitat across the GYE. This model was used to identify existing denning habitat and areas where this habitat may change as a result of implementation of the Proposed Action.

5.1.3.2.3 Security

The most recent Motorized Access Database, maintained by the IGBST, was used to model changes in the motorized access resource indicators (secure habitat, TMARD, and OMARD) for the Proposed Action for each of the affected Subunits. The IGBST is an interdisciplinary group responsible for long-term monitoring and research of effects on grizzly bears in the GYE, and the Motorized Access Model is the standard for measuring and tracking the motorized access indicators in the GYE as required in the GBCS (Interagency Conservation Strategy Team 2016).

Pertinent literature was also reviewed to obtain information on displacement and mortality risk of grizzly bears in response to human-induced changes on the landscape.

5.1.4 Affected Environment

5.1.4.1 Existing Condition

In general, the entire analysis area provides suitable habitat for and is occupied by grizzly bears. The IGBST ran an analysis to estimate the presence of grizzly bears with home ranges that potentially overlap the project area (Karabensh et al. 2019). They concluded that the area is well-used by grizzly bears. Specifically, they stated that:

> Grizzly bears of both sexes and all age classes were documented within the analysis area encompassing the proposed South Plateau project area during 2009-2018. Grizzly bears occurred in the analysis area during all seasons. Grizzly bear location data indicate the proposed site is located within the home ranges of a substantial number of individual male and female grizzly bears of all age classes. Viewed collectively, these data indicate frequent, consistent, and long-term use of the area by all cohorts of grizzly bears.

5.1.4.2 Food and Seasonal Foraging Habitat Quality

Grizzly bears are opportunistic omnivores and will feed on almost any food available, which includes a wide variety of animals and plants (Van Manen et al. 2013, USDI Fish and Wildlife Service 2017 pg. 30509). Four food sources in the GYA have long been considered important to grizzly bear survival in the GYE (USDI Fish and Wildlife Service 2007c pg. 14867). These foods include army cutworm moths, native cutthroat trout, ungulates, and whitebark pine nuts. Army cutworm moths are utilized by bears primarily in the eastern portion of the GYE, and cutthroat trout are important primarily around Yellowstone Lake in Yellowstone National Park. Neither of these food items are, therefore, major food items for grizzly bears in the project area. Winter-killed ungulates and whitebark pine nuts are important to grizzly bears in the northwestern portion of the ecosystem, where this project is located. The US Fish and Wildlife Service Proposed Rule to Delist the Grizzly Bear (USDI 2016) states that food items utilized by bears also includes a wide variety of plants (grasses, sedges, horsetail, and forbs), colonial insects (ants and wasps), fungi, berries (huckleberry, whortleberry, and gooseberry), and small mammals (voles, ground squirrels, and pocket gophers). The 2017 Final Rule to Delist the Yellowstone grizzly bear (USDI 2017) also stated that the combination of food sources in the GYE grizzly bear, including army cutworm moths, whitebark pine, cutthroat trout, and ungulates comprises a unique ecological setting because no other population utilizes this combination of food resources.

Despite the importance of meat and whitebark pine to grizzly bears in the affected subunits, grizzly bears are omnivores that utilize a wide variety of plants. Gunther et al. (2014) documented use of greater than 266 animal and plant species consumed by grizzly bears in the GYE. This dietary flexibility both

enhances grizzly bears' ability to occupy diverse habitats over large spatial scales as well as allows them to cope with perturbations in the abundance of their preferred foods (Gunther et al. 2014 pg. 69). Research also suggests that in response to changes in availability of food sources grizzly bear shift use to other available forage items within their home ranges (Costello et al. 2014). While this research indicates that grizzly bears may not be dependent upon any particular food resource or resources, it does suggest that the more productive and biodiverse an area is, the more likely it is to provide the vast array of food resources used by grizzly bears. Areas that support a wide diversity of plant and animals species are likely to be preferred foraging areas for bears. Aspen and riparian areas are considered the most biologically diverse communities in the West. These areas, therefore, likely provide some of the most important foraging areas on the landscape for grizzly bears.

5.1.4.2.1 Ungulates

All of the project area lies within general or summer range habitat for Rocky Mountain elk. Montana FW&P indicates that the lowest elevation areas in the project area, primarily west of the South Fork of the Madison River and in the lower reaches of the East and West Fork of Cream Creek and the East Fork of Buttermilk Creek, provides winter range for elk. This same area provides winter range for moose. Although mule deer and whitetail deer use portions of the project area on an occasional basis during the winter, the project area does not contain identified winter range for deer. Grizzly bears rely on winter-killed ungulates throughout the project area for forage early in the spring when they emerge from their dens. Moose and elk are important food items across the project area.

5.1.4.2.2 Whitebark Pine

Whitebark pine is present in the highest elevations of the project area near the Idaho-Montana border at elevations above 8,000 feet. Whitebark pine nuts provide an important fall food source for grizzly bears during years of high cone production. As stated in Demastus (2022), within the GYE, whitebark pine communities have suffered large scale mortality due to a recent mountain pine beetle outbreak, wildfire, and, to a lesser extent, blister rust. Costello and others (2014) found that grizzly bear did not change mobility (distance traveled to find food) during whitebark pine declines; individuals foraged on alternative foods within their home ranges. Whitebark pine seeds (nuts) are high-energy foods rich in fats, carbohydrates, and protein, and are, thus, highly sought-after by grizzly bears whose home ranges include this habitat in the fall when bears are fattening up for the winter denning season. Grizzly bears are unable to obtain whitebark pine nuts from the tree canopies in an efficient manner, however, and must rely on red squirrels to collect the nuts, split them open, and then concentrate them in ground middens. Grizzly bears can then efficiently "harvest" sufficient quantities of whitebark pine nuts by raiding these red squirrel middens. Red squirrels do not inhabit pure whitebark pine stands. This is because whitebark cone production does not occur on a reliable or predictable basis. Red squirrels, instead, forage in mixed forest stands that include whitebark pine, where forage opportunities are more reliable. Grizzly bears, therefore, also tend to forage in mixed stands because of their reliance upon red squirrels to obtain and concentrate the whitebark pine nuts.

5.1.4.2.3 Aspen

Aspen stands are important to grizzly bears, because they provide increased foraging opportunities for both grizzly bears and their prey species. These communities are rich in insect and plant diversity, both of which contribute directly to the diet of grizzly bears. Ungulate species such as moose and elk rely heavily on young aspen shoots for forage, and aspen, therefore, contributes to the diet of important prey species. Aspen is scattered throughout the lower elevations of the project area but is most notable in the vicinity of the South Fork of the Madison, Cream Creek, and Buttermilk Creek. Field observations indicate that

aspen sustainability in the project area is threatened by competition with encroaching conifers, primarily Douglas fir, lodgepole pine, and spruce. Observations in some stands have noted varying levels of browse.

5.1.4.2.4 Riparian Areas

Riparian areas, as with aspen stands, provide important food sources for grizzly bears due to their high diversity of plant and insect populations and the fact that prey species tend to rely on these areas as well. Riparian areas are often favored by bears as travel routes across the landscape, because they provide good forage opportunities in areas characterized by higher levels of hiding cover. Riparian areas in the vicinity of the project area are abundant in a portion of the area and include ponds and wetlands in the South Fork Madison River area, and smaller wetlands and riparian areas along the forks of Cream Creek and Buttermilk Creek. Generally, the area west and north of the South Fork Madison has a good distribution of water; the area south and east of the South Fork tends to be much drier, and water sources are scarce. These include a small number of springs and several ponds, one of which is located across the state line in Idaho.

5.1.4.2.5 Forest Understory Vegetation

Most of the project area is heavily forested (primarily lodgepole pine) and consists mostly of mid-seral stands dominated by lodgepole pine. Small patches of Douglas-fir are found in the lower elevations near the valley bottom. Subalpine fir, Engelmann spruce, and whitebark pine are relatively scarce at mid and low elevations; they are restricted to a relatively small proportion of the landscape along the Idaho-Montana border and in the northwestern portion of the project area. Berry producing shrubs such as grouse whortleberry, huckleberry, buffalo berry, and snowberry are scattered in the understory across most of the project area. Grizzly bears rely on the berries produced by these shrubs as an important food source in some areas. Mattson (1997) examined grizzly bear use of lodgepole pine habitat in the Greater Yellowstone Ecosystem. He found that grizzly bear use of any given cover type in the lodgepole pine habitat types was quite variable (used less than, more than, or in proportion to availability) based on the year, location, and stand-level factors such as age, stand structure/composition, and other structural features (Mattson 1997). A portion of the project area (generally north of the South Fork Madison and the 6973 Road) lies within an obsidian sands geology. The obsidian sand flats support lodgepole pine with sagebrush and bitterbrush in the understory, which are not berry-producing and are not major food sources.

5.1.4.3 Denning Habitat

According to the IGBST suitable grizzly bear denning habitat model, Grizzly bear denning habitat is not limited in any of the Subunits, although the majority of denning habitat in the Madison #2 Subunit is located on NPS lands (Podruzny 2002) (Figure 4). Contributing variables determined to be important to den habitat selection were mean elevation, slope, solar radiation, and percent of forested cells (Podruzny 2002) .

Table 7 shows the amount of denning habitat available in each Subunit.

Table 7: Acres of denning habitat currently available in each Subunit within the Project Area

Bear Management Subunit	Acres of Denning Habitat	% of Subunit in Denning
Henry's Lake #2	64,913	72.3%
Madison #2	22,484	23.5%
Plateau #1	121,279	66.2%

5.1.4.4 Hiding Cover

Hiding cover is abundant in the action area. Analysis of elk hiding cover in the Henry's Mountains Elk Analysis Unit, which encompasses all of the Henry's Lake #2 and portions of the Madison #2 and Plateau #1 Subunits indicates that the existing proportion of vegetation cover types capable of providing hiding cover) with at least 40% canopy cover that currently function as hiding cover is 95.3%. Analysis of hiding cover at the Subunit scale found that about 46,390 acres, 35,257 acres, and 111,780 acres that meet the definition of hiding cover are present in the Henry's Lake #2, Madison #2, and Plateau #1 Subunits, respectively. This equates to 193,427 acres of existing hiding cover in the three Subunits. Within the three Subunits there are approximately 293,534 acres capable of providing hiding cover.

5.1.4.5 Grizzly Bear Security and Displacement/Mortality Risk

Grizzly bears avoid human activities and developments, preferring to forage in remote, undisturbed areas, less impacted by the influence of humans. Displacement is often associated with avoidance of roads, but grizzly bears are disturbed by the activities associated with those roads, not just the roads themselves. Roads, therefore, serve as a suitable metric for avoidance, but disturbance from human activities is also an important consideration, even when those activities take place in areas that are not roaded.

Motorized access has been shown to influence grizzly bears at the individual and population levels by affecting habitat use, home-range selection, movements, causing fragmentation, and affecting demography (Proctor et al. 2020). Research has shown that grizzly bears select habitat adjacent to motorized routes less frequently than areas farther from those routes, even when the motorized use on those routes is relatively low (Lamb et al. 2018, Mattson et al. 1987, McLellan and Shackleton 1988, Aune and Kasworm 1989, Kasworm and Manley 1990, Mace and Manley 1993, and Mace et al. 1996, all as cited in USDI Fish and Wildlife Service 2007) or when the habitat quality along these routes is high (USDI Fish and Wildlife Service 2007). Wielgus and others (2002) found that while grizzly bear avoided open roads, and in some cases closed roads, they did not avoid roads used intermittently solely for forestry access (timber harvest and administration). Wielgus and Vernier (2003) had similar results in the Selkirk Mountains of Idaho. They found that grizzly bears selected against open roads (and adjacent closed roads) and that forestry activities by themselves (managed forests, restricted roads) had no discernable negative effect on grizzly bear habitat use. In southern Alberta, researchers found that roads closed to the public were not avoided by bears, and habitats near those roads were used at similar levels to unroaded areas (Northrup et al. 2012). Northrup and others (2012) also found that bears avoided roads with moderate to high traffic levels, but selected areas near low traffic volume roads. If human-related disturbance is prolonged, grizzly bear use of an area may be lost for several generations, because females pass on the avoidance behavior to their cubs (Aune and Kasworm 1989 as cited in USDI Fish and Wildlife Service 2007).

The importance of cover to grizzly bears has been documented in the scientific literature (USDI Fish and Wildlife Service 1993). Cover can influence selection of foraging habitats and bed locations (USDI Fish and Wildlife Service 1993, Serrouya et al. 2011) and can even increase foraging in areas that would otherwise be avoided because of their proximity to roads (Gibeau et al. 2002). The scientific literature does not provide specific definitions or thresholds for suitable or adequate amounts of cover for grizzly bears, but it is understood that timber management has the potential for reducing thermal, resting, and security cover for bears (USDI Fish and Wildlife Service 1993).

Roads negatively affect grizzly bears through displacement and increased mortality risk (Claar et al. 1999, USDI Fish and Wildlife Service 2007a and 2017, Mace et al. 1996, Schwartz et al. 2010, Interagency Conservation Strategy Team 2016). USFWS provided an extensive review of the effects of motorized access on grizzly bears in the Biological Opinion (BO) on the GNF Travel Plan (USDI Fish and Wildlife Service 2007a). Much of the pertinent information is summarized here, but, for the full analysis, please refer to that document, which is contained in the project record.

Roads have been shown to increase mortality risk to individual grizzly bears, either directly, through motor vehicle collisions and illegal shooting, or, indirectly, through habituation to human presence, which increases the potential for conflicts between humans and grizzly bears (USDI Fish and Wildlife Service 2007 and 2017). Habituated grizzly bears tend to experience higher mortality rates, as they generally get removed from the population through management actions or are more vulnerable to illegal shootings because of their higher exposure to people (USDI Fish and Wildlife Service 2007a). Mace et al. (1996) found that grizzly bear deaths were often directly influenced by road access due to illegal killing and management removal of bears conditioned to human foods in developed areas. Schwartz et al. (2010) found that grizzly bear mortality was best explained by the level of human development of the landscape within the home ranges of bears. Survival improved as secure habitat and elevation increased but declined as road density, number of homes, and site developments increased. Their research strongly supported findings that roads and developed sites present hazards to grizzly bear survival. Amount of secure habitat and density of roads in non-secure habitat were determined to have the greatest effect on grizzly bear survival. Ungulate hunting was also found to negatively affect survival, with increased mortality associated with hunters defending a camp, carcass, or themselves when charged by a grizzly bear. An additional concern was increased mortality risk for grizzly bears in poor whitebark pine seed years, because grizzly bears tend to move to lower elevations in these years in search of forage, where the presence of human-related hazards increase. It is important to note that the authors reported that open road density was more important in explaining grizzly bear mortality risk than total road density, because open roads provide more access to the public, which exacerbates the risk to grizzly bears. Due to the general scientific consensus regarding the effects of motorized access on grizzly bear survival, management of roads is considered to be one of the most important factors in grizzly bear habitat conservation (USDI Fish and Wildlife Service 2007a; Interagency Conservation Strategy Team 2016). The direction for road and access management on the GNF has changed over time.

Access management guidance for grizzly bears was first provided in 1994 by the Interagency Grizzly Bear Committee (IGBC) Taskforce (Interagency Grizzly Bear Committee 1994). This guidance referred to management of core (now referred to as “secure”) habitat and road density measures (OMARD and TMARD). Secure habitat is defined in the GBCS as areas more than 500 meters from an open or gated motorized access route or reoccurring helicopter flight line that are greater than or equal to 10 acres in size (Interagency Conservation Strategy Team 2016). Secure habitat is reported as the proportion of a given BMS that meets this definition. OMARD was defined in the Taskforce Report as a measurement that includes open roads and open motorized trails (those that are open to the general public) where density is displayed as a percentage of an analysis area in a defined density category. TMARD was defined as a measurement that includes open and restricted roads and motorized trails where density is

displayed as a percentage of an analysis area in a defined density category. Mace and Manley (1993) found that grizzly bears used habitat less than expected when total road densities exceeded 2 mi/mi^2 and open road densities exceeded 1 mi/mi^2.

The GBCS was finalized in 2003 and updated in 2007 and 2016 (Interagency Conservation Strategy Team 2016). This document was designed to provide adequate regulatory mechanisms after delisting and ensure long-term maintenance of the recovered population (USDI Fish and Wildlife Service 2017). The GBCS incorporates the best and most current scientific information with respect to grizzly bear management. The Forest Service signed an MOU agreeing to implement all aspects of the GBCS to maintain and enhance the recovered status of the grizzly bear (Interagency Conservation Strategy Team 2016). The GBCS acknowledged that grizzly bear researchers and managers now generally agree that secure habitat is especially important to the survival and reproductive success of grizzly bears, especially adult female grizzly bears (Interagency Conservation Strategy Team 2016). In recognition of this, the GBCS contains recommended standards for threshold values of secure habitat but not for OMARD and TMARD. Rather, it recommended that these access management values be monitored and reported annually (Interagency Conservation Strategy Team 2016, page 70).

In response to the updated science and management recommendations included in the GBCS, the GNF amended its FP in 2015 to replace the outdated language for grizzly bear management with this most current guidance as standards. The Record of Decision for the revised Forest Plan for the Custer Gallatin National Forest (USDA 2022) was signed in January 2022. The new Forest plan largely incorporates the direction provided in the 2016 Conservation Strategy, but does include a slightly different methodology for secure habitat assessment. The Interagency Developed Sites Technical Team (Tech Team) was established and tasked with examining alternative scenarios and recommending appropriate changes to the habitat standards and application rules in the Conservation Strategy that would provide added management flexibility to address demands associated with increased public visitation. The Tech Team recommendations include revising the definition for secure habitat as "any contiguous area > 10 acres in size and > 500 meters from an open or gated motorized route, recurring low level helicopter flight line, **or perimeter of a prescribed developed site footprint**" (Landenburger 2019, unpublished). Previously, developed sites of this type were a point on a map; under the "footprint" methodology these highly developed areas are now represented as a polygon. Rather than buffering off existing roads, the "footprint" of the site would be buffered. This will allow for potential future expansion to accommodate increased recreational demands. At the same time, this will result in a decrease in the proportion of a Subunit that is secure. As a result, both the baseline level of secure and the existing condition would be slightly different than levels calculated under the previous Conservation Strategy and Forest Plan methodology. For a complete discussion of this change, please refer to the Biological Assessment for the Custer Gallatin Forest Plan (USDA 2020). The GBCS recommended that habitat conditions for grizzly bears be managed at or above levels that existed in 1998 (Interagency Conservation Strategy Team 2016), for all but three Subunits. This year was selected as a baseline for habitat management because all demographic recovery criteria for grizzly bear had been met by 1998 (Interagency Conservation Strategy Team 2016). In addition, the grizzly bear population had been increasing throughout the 1990's, and levels of secure habitat and the number and capacity of developed sites had changed little from 1988 to 1998 (Interagency Conservation Strategy Team 2016, USDI Fish and Wildlife Service 2017). The GBCS recognized that three Subunits had the potential for improvement in the amount of grizzly bear secure habitat above 1998 levels, and it stated that the quantity and timing of improvement for these Subunits would be determined by the GNF Travel Plan, which would be followed by an amendment to the FP that would set a baseline for these Subunits (Interagency Conservation Strategy Team 2007, pg. 44). The 2015 Cleanup Amendment ensured that the levels of secure habitat according to full Travel Plan implementation in these Subunits are now the new baseline; the 2022 Forest Plan also incorporated this caveat in Standard FW-STD-WLGB-01. The Madison #2 and Henry's Lake #2 Subunits both fall within

the SPLAT project area. Both were identified as Subunits in need of improvement in the GBCS (ICST 2016). For these Subunits, the baseline level of secure habitat is the level calculated for when the travel plan is fully implemented within that Subunit. It is important to note that the concept of a "baseline" level is only true for secure habitat. The Forest Plan (USDA 2022) provides no direction or thresholds for OMARD and/or TMARD. While not a Forest Plan standard or guideline, OMARD and TMARD can be useful in providing context for the analysis of effects to grizzly bears. Because the proposed action has identified a number of access changes, including decommissioning of open roads, openings administrative routes to the public, closing an open route to the public, and decommissioning several administrative routes, OMARD and TMARD will be assessed with regard to compliance with the 2013 Amended Incidental Take Statement for the Gallatin Travel Plan (USDI 2013), which requires that OMARD and TMARD meet or be better than the full Travel Plan implementation level in Subunits that are in need of improvement.

Table 8 shows baseline levels of secure habitat, existing (2021) levels, and the difference between these values for each of the Subunits affected by the project. Secure habitat levels are based on the most recent grizzly bear access model data (2020), but also incorporate changes since this data was updated. For this analysis, this includes decommissioning of one road (2545) in the Henry's Lake #2 Subunit in summer 2021. This data was also updated to account for the new "footprint" methodology for secure habitat delineation for some developed sites. The baseline for the Plateau #1 Subunit is the 1998 level, while the baseline for the Madison #2 and Henry's Lake #2 Subunits is the level at full GNF Travel Plan implementation, as explained above. Secure habitat is reported as the proportion of the Subunit that is secure.

Table 8: Baseline levels, 2021 levels, and the difference between these levels of secure habitat in each Subunit affected by the project. 2021 levels are the most recent data available.

Bear Management Subunit	Baseline[1]	Existing (2021)	Difference Between Baseline and Existing
Henry's Lake #2	52.0%	52.0%	0 (they are the same)
Madison #2	67.4%	67.4%	0 (they are the same)
Plateau #1	68.6%	70.6%	+2.0%

[1]Baseline levels of secure incorporate the new footprint methodology used in the 2022 Custer Gallatin Forest Plan. As developed sites where footprints were drawn existed in 1998, this methodology changed the baseline conditions in some Subunits. A similar situation exists for those Subunits where the full Travel Plan implementation level provides the baseline.

Does this mean that the FS can't cause any harm to secure habitat for bears in these subunits?

Table 9 shows 1998 levels of TMARD, 2021 levels, and the difference between these values for each of the Subunits affected by the project. TMARD is defined and reported as the proportion of the subunit with total motorized route densities (including roads open to the public and administrative routes used during the season when bears are active) that exceeds 2 mi/mi^2. In all three Subunits, TMARD is currently below 1998 levels and meets or is better than the full implementation level provided by the Gallatin Travel Plan (USDA 2006).

Table 9: 1998 levels, 2021 levels, and the difference between these levels of TMARD in each Subunit affected by the project. 2021 levels are the most recent data available.

Bear Management Subunit	1998 level	Existing (2021)	Difference Between 1998 and Existing
Henry's Lake #2[1]	35.2%	28.1%	-7.1%
Madison #2[1]	24.0%	21.6%	-2.4%
Plateau #1	12.9%	10.3%	-2.7%

[1]Full Travel Plan implementation levels for the Madison #2 and Henry's #2 Subunits is 21.7% and 30.5%, respectively.

Existing levels are below mandated levels, which is a good thing.

Table 10 shows 1998 levels of OMARD, 2021 levels, and the difference between these values for each of the Subunits affected by the project. OMARD is defined and reported as the proportion of the subunit with motorized route densities (including only those routes open to the public during the season when bears are active) that exceeds 1 mi/mi^2. In all three Subunits, OMARD is currently below 1998 levels and meets or is better than the full implementation level provided by the Gallatin Travel Plan (2006).

Table 10: 1998 levels, 2021 levels, and the difference between these levels of OMARD in each Subunit affected by the project. 2021 levels are the most recent data available.

Bear Management Subunit	1998 level	Existing (2019)	Difference Between 1998 and Existing
Henry's Lake #2	49.9%	40.6%	-9.4%
Madison #2	33.7%	32.0%	-1.7%
Plateau #1	22.2%	19.0%	-3.3%

[1]Full Travel Plan implementation levels for the Madison #2 and Henry's #2 Subunits is 32.0% and 41.3%, respectively.

Existing levels are below mandated levels, which is a good thing.

Grizzly bear mortality data was provided in the Summary of Verified Grizzly Bear Occurrences Report provided to the Project biologist by the Interagency Grizzly Bear Study Team. This report indicates for the period from 2009-2018, there have been 22 grizzly bear mortalities (6 at conflict sites, 6 in self-defense, 5 accidents, 2 mistaken identity, 2 related to livestock depredation, and 1 illegal killing) within a 24 kilometer buffer of the South Plateau Project area. None of the hunting or assumed hunting-related mortalities in this report occurred in the South Plateau Project area. However, there was a grizzly bear mortality in the summer of 2019 immediately adjacent to the town of West Yellowstone that was a case of mistaken identity by a black bear hunter.

5.1.5 Environmental Consequences

5.1.5.1 Direct and Indirect Effects

5.1.5.1.1 Food and Seasonal Foraging Habitat Quality

The project has the potential to affect grizzly bear food and seasonal foraging habitat quality. Resource indicators used to evaluate this potential consist of how the project will affect ungulates (including their food resources and potential displacement), whitebark pine, aspen, riparian areas, and understory vegetation. This section discloses effects of the project on these resource indicators.

5.1.5.1.1.1 Alternative 1 – No Action

Not implementing any of the proposed activities could result in a variety of conditions on the landscape depending on the timing, intensity, and scale of disturbance events.

Ongoing fire suppression would have mixed effects on grizzly bear habitat. Understory vegetation would diminish as conifers would continue to grow and shade out other plant species. This would also affect distribution of ungulates. Both of these outcomes would diminish foraging opportunities for grizzly bears. Whitebark pine stands in the highest elevations within the SPLAT project area would be expected to continue to decrease as a result of competition from more shade tolerant species. This would reduce the availability of this important food source for grizzly bears. As this food resource is relatively limited in the SPLAT area, it is unlikely that this further reduction would appreciably impact grizzly bear in the analysis area. Foraging opportunities for grizzly bears in aspen stands would also decrease, as these stands convert to less diverse, conifer-dominated communities in the absence of fire. Water storage capacity in the project area would diminish, as increasing tree density would result in higher rates of transpiration and loss of water to the atmosphere, which would cause a decline in distribution and vigor of riparian habitats. This would also reduce foraging habitat quality for grizzly bears.

Continued susceptibility and mortality of trees from insects and disease and high severity wildfire in the forested communities across the analysis area would also be expected under this alternative. Effects of insect and disease on understory vegetation could be beneficial. As trees die and eventually fall, there would be potential for additional forage to be created since more open canopies allow greater light penetration that would stimulate production of understory vegetation. This could increase foraging opportunities for ungulate species. Increases in dead wood in affected stands would also increase potential forage for grizzly bears (insects and other dead-wood dependent organisms). All of these outcomes would benefit grizzly bears. Whitebark pine would be expected to continue to diminish over time, due to continued susceptibility to insects and disease. Aspen could benefit due to reduced competition with conifer species. Riparian areas may also improve, as a reduction in conifers would increase the amount of water available in the system.

5.1.5.1.1.2 Proposed Action

5.1.5.1.1.2.1 Ungulate Displacement

Project activities would not lessen the presence or abundance of ungulate prey species across the analysis area, but the proposed activities could alter their distribution in the vicinity of the project area. Project activities would be expected to cause some disturbance and displacement of big game, but these effects would be limited to areas where treatments take place. Impacts would also depend on how proposed treatments would affect areas where ungulates are most likely to occur. Montana FWP indicates that the majority of ungulate usage occurs in the northwestern portion of the project area (generally north and west of the South Fork of the Madison River). While collar data does not indicate that the area east of the South Fork Madison is used extensively by elk, they are present in the area. Elk displaced in this area would likely move elsewhere in the project area where activities are not occurring, east into the Park, or west toward the Idaho-Montana divide. Because grizzly bears operate at such a large scale, bears would be able to adjust to alterations in big game distribution (as well as changes in other food resources), and effects on grizzly bears are expected to be relatively minor due to the availability of forage elsewhere in individual home ranges and within the larger Subunits.

In the longer term, treatment activities would permit more light to penetrate dense conifer stands, potentially improving growing conditions for understory vegetation. Nutrients and water would also be

more available to understory grasses, shrubs, and forbs. Treatment units may be more desirable to grazing ungulates post-treatment.

5.1.5.1.1.2.2 Whitebark Pine

Treatment activities would be consistent with measures for protecting and restoring whitebark pine described by Keane and others (2012) and the Whitebark Pine Strategy for the Greater Yellowstone Area (GYCC 2011). Because grizzly bears forage for whitebark pine nuts in mixed stands where red squirrels create their middens, treatments in mixed forest stands that are designed to enhance whitebark pine have the potential to reduce the quality of grizzly bear foraging habitat in the short term. There are a total of 72 acres of potential treatment in the whitebark pine zone within the project area (Demastus 2022). Additional whitebark, if discovered during recon, may be treated in existing mapped units. The majority of whitebark observed in the project area were less than 6 inches in diameter. The treatment matrix indicates that where a stand within a mapped potential treatment unit has >25% whitebark pine, other conifers within and near healthy whitebark pine would be removed. As whitebark does not appear to be a widespread species in much of the project area, treatment specifically to clear around whitebark is relatively unlikely to occur over a large area; the most likely scenario is that small areas around whitebark pine patches would be cleared. These treatments would be similar to a daylighting treatment designed to reduce competition for sunlight and other resources in the immediate vicinity of whitebark pine. As a result, residual stand composition is not expected to appreciably change. Stands would be maintained in a mixed conifer condition and support potential prey/cone-caching species such as red squirrel.

In the long-term treatments designed to enhance whitebark pine would benefit grizzly bears by enhancing the persistence of this important food source, even though this activity would occur on a very small portion of the landscape in small patches. Keane and others (2012) note that whitebark pine must attain a good canopy volume in order to have high cone production. Removing overstory competition and releasing small diameter whitebark pine, which do not grow well under full shade, will allow trees to add volume to their crowns and ultimately become good seed producers. This would enhance the potential for whitebark pine trees to continue to persist as a component of the ecological communities in the project area, and, ultimately, this would present a long-term benefit to grizzly bears. The South Plateau Project would also create openings that may be used by seed-caching bird species, potentially increasing regeneration of whitebark pine in the future.

The proposed actions could in the long-term help to maintain the overall capacity of these stands to sequester carbon by increasing vigor and resilience of whitebark. Pro-actively managing forests to increase their resilience is the best approach for confronting an uncertain future (Millar et al. 2007). Increased resilience would reduce the probability and severity of disturbances such as wildfire and pest outbreaks.

5.1.5.1.1.2.3 Aspen

Aspen enhancements would benefit grizzly bears by enhancing foraging opportunities for individual bears and their prey species, such as moose and elk. The proposed treatments would reverse past declines in this habitat type resulting from competition with conifers and other factors, provide for a mosaic of habitat types and species compositions that promote high quality grizzly bear habitat, and provide for the persistence of this species in treated stands. Known aspen enhancement treatments would occur on approximately 162 acres in the project area; in addition, where aspen is encountered in proposed units it would be treated to improve aspen habitat quality.

5.1.5.1.1.2.4 Riparian Areas

Riparian areas would be protected through project design and development of mitigation measures that would be applied during implementation. Treatments would be reduced, altered, or eliminated, to avoid or

reduce impacts to riparian areas. Vegetation management would only occur in the inner riparian management zone if the purpose is to restore or enhance the ecological integrity of aquatic and riparian-associated resources. These activities would be planned in collaboration with the project hydrologist and/or fisheries biologist. In additiona, a design criteria was included in the project that states that clear-cut harvest should not occur in the riparian management zone. See White (2022) and Stringer (2022) for water quality, riparian, and aquatic habitat design features and mitigation measures. If treatment were to occur in the inner riparian zone, the structure and function of the riparian area (including large woody material inputs) would be maintained. Treatments in the outer riparian zone would be designed to ensure the protection of ecosystem functions of the inner riparian management zone. Overall, wetlands, complexes of wet areas (including wet meadows), springs, ponds, and other wet areas would be protected. All wetlands and/or complexes of wet areas/fens/peatlands greater than one acre and man-made and natural ponds (no size requirement) shall be buffered a minimum of 100 feet. Wetlands and/or complexes of wet areas/fens/peatlands less than one acre and springs, wallows, and other wet areas less than one acre shall be buffered a minimum of 50 feet to protect these features and surrounding habitat. This design feature would retain structure in the vicinity of water sources that tend to be limited in portions of the project area. These design features and mitigation measures would protect riparian habitat function for grizzly bear and other wildlife.

5.1.5.1.1.2.5 Forest Understory Vegetation

Research indicates that tree removal for thinning or timber harvest and prescribed burning can result in localized increases in bear foods through increased growth of grasses, forbs, and berry-producing shrubs (Zager et al. 1983). Nielsen and others (2004) demonstrated that grizzly bears selected for clearcut areas within a lodgepole pine community. They speculated that due to the homogeneous makeup of lodgepole pine forests, clearcuts may have offered the only open habitat type, making bear selection of clearcuts within the study area less profound. Mattson (1997) and Milakovic et al. (2012) noted that grizzly bears take advantage of early successional habitat. Mattson (1997) noted that grizzly bear use of any given cover type in the lodgepole pine forest type was variable. Mattson (ibid.) found that grizzly bear grazing on grasses and forbs were both positively associated with young lodgepole pine forest (less than 40 years old and dominated by grasses, forbs, shrubs, and small diameter regenerating trees) and a mosaic of lodgepole pine forest and nonforest cover types and with mesic and wet habitat types, and negatively associated with mature lodgepole pine stands and dry types (Mattson 1997). The predominant habitat type of lodgepole pine stands in the South Plateau project area is classified as “cool and dry to moist” according to the project silvicuturist, so there is a spectrum of drier stands as well as more mesic stands. Created openings in all of these stands would encourage the growth of grasses and forbs that may be utilized by grizzly bears, especially in the spring and early summer. In the Island Park area (primarily the Caribou-Targhee National Forest) Rossi and others (2020, draft, publication pending) found that grizzly bears selected for clearcut and non-conifer mix over conifer forests during spring, but avoided clearcuts during the early hyperphagia period. Increased grass, forb, and shrub production would occur in areas where the forest canopy is opened enough to stimulate growth of understory production. The proposed activities would damage individual plants and shrubs, but there would be an overall net gain of understory vegetation. The amount and diversity of understory production would vary depending on the site potential and vegetation type.

Under the existing condition, much of the project area is comprised of a monoculture of young and middle-aged lodgepole pine stands. Given the fact that treatment would create a mosaic of created openings, thinned stands, and untreated stands, it may result in a wider distribution of bears across the landscape due to improved understory forage and potential prey/carrion (ungulates).

5.1.5.1.2 Denning Habitat

5.1.5.1.2.1 Alternative 1 – No Action

Under the No Action Alternative, there could be mixed effects to denning habitat. Fire suppression would inhibit losses of denning habitat by maintaining, and, likely increasing, cover on the landscape. Ongoing susceptibility of trees to insect and disease pathogens could result in greater losses of forested cover in the treatment units; however, increased dead wood may contribute to potential denning habitat suitability. Denning habitat is available in all three affected subunits and has not been identified as a limiting factor for grizzly bears in the area. Small temporary reductions in denning habitat resulting from implementation of the no action alternative would, therefore, be minor.

5.1.5.1.2.2 Proposed Action

Table 12 lists the amount of grizzly bear denning habitat affected by the Proposed Action. Suitable denning habitat affected by the Proposed Action would be spread throughout the project area. Although not all treatments are expected to temporarily convert suitable denning habitat to unsuitable denning habitat, some treatments would have more of an effect than others. The forested stands suitable for denning and proposed for regeneration harvest (primarily clearcut harvest) would temporarily no longer provide denning habitat due to loss of cover. Table 12 below displays the acres of treatment in potential denning habitat. It should be noted that 8,787 acres of clearcut harvest has been preliminarily identified in the project area. While this amount of clearcutting is proposed, a maximum of 4,600 acres of regeneration harvest would be allowed in lynx habitat in the LAU (see *Canada Lynx* section) to be in compliance with NRLMD standard VEG S2. The draft treatment matrix would identify where clearcut harvest would be appropriate (based on size, age, composition of stand and other factors) and sideboards and design criteria/features would dictate the size and distribution of potential clearcut harvest. The maximum size of clearcuts would be 40 acres, their shapes would be variable (irregular shapes preferred), and at least 500 feet of untreated vegetation would separate individual regeneration harvest units. As a result, it is expected that actual acres of denning habitat affected by implementation would be less than what is shown in Table 11 below.

Table 11: Acres of grizzly bear denning habitat affected by the proposed action by treatment type and percent of all denning habitat available

BMS[1]	Clearcut	Thinning	Other Treatments	Total Denning Habitat Affected	% Denning in Subunit Affected
Madison #2	324	233	77	634	2.8%
Henry's #2	3,200	1,299	1,898	6,397	9.9%
Plateau #1	4,550	1,667	834	7,051	5.8%
Total	8,074	3,199	2,809	14,082	6.7%

Regular human use of an area in the winter time in areas otherwise suitable for denning may cause bears to avoid or abandon den sites (Linnell et al. 2000). Winter logging has some risk, then, of reducing denning opportunities even where habitat is suitable, if activities occur early enough in the season, when grizzly bears are selecting a den location. Winter harvest is not proposed in the SPLAT area; design features would be implemented that mandate no snow plowing, harvest, or hauling of material from November 1-April 30. Wildlife design features state that there would be no vegetative treatment activities in big game winter range from December 1-April 30 as well. As a result, there would be no project-related activities during the denning season that would disturb denning grizzly bears. These design features would also reduce disturbance during den emergence. Given the amount of denning habitat available in

the three Subunits, as well as untreated areas within the project area, it is expected that grizzly bears would be able to find suitable denning sites post-implementation. Any temporary reduction of denning habitat would be negligible when considered relative to the scale of the three affected subunits and availability of suitable denning habitat in the immediate vicinity of proposed treatments.

5.1.5.2 Hiding Cover

5.1.5.2.1 Alternative 1 – No Action

Under the No Action Alternative, there could be mixed effects to hiding cover. Fire suppression would maintain or increase hiding cover on the landscape. Ongoing susceptibility of trees to insect and disease pathogens could result in greater losses of forested cover in the treatment units in the future. These stands would become more susceptible to these agents in the future as well. Hiding cover is available in all three affected subunits and has not been identified as a limiting factor for grizzly bears in the area. Temporary reductions in hiding cover resulting from implementation of the no action alternative would be expected to be minor at the scale of the three affected subunits.

5.1.5.2.2 Proposed Action

In many cases, treatments in the project were designed to alter existing forest structure and species composition. Forested cover would be reduced in all three affected Subunits under the Proposed Action. For purposes of analysis, all treatment types overlapping hiding cover were assumed to change these stands to a condition that would not be effective hiding cover for the short and mid-term. It is expected that some areas in treated stands would continue to provide hiding cover (prescribed burn units, patches of cover retained in winter range for big game, etc.). In addition, the application of sideboards, design features, and other restrictions is expected to reduce impacts to hiding cover since there would be a number of acres of treatment that would be dropped from consideration. Hiding cover would be most impacted in regeneration harvested stands; retention of buffers between regeneration harvested patches (a maximum of 40 acres) would provide for screening vegetation in these areas that could be used to escape predators or other disturbance. Based on GIS data used for the big game effects analysis in the Project Environmental Analysis, there would be approximately 7,868 acres, 2,913 acres, and 7,598 acres of hiding cover impacted by treatment activities in the Henry's Lake #2, Madison #2, and Plateau #1 Subunits, respectively, under this project. This would equate to a 16.9% reduction in hiding cover in the Henry's Lake #2 Subunit, an 8.3% reduction in the Madison #2 Subunit, and a 6.8% reduction in the Plateau #1 Subunit.

Ingrowth of small diameter vegetation and trees over a period of years would provide low-level structure that would provide screening at this time scale. Because grizzly bears operate at the landscape level, changes in forested cover at the stand level would not be expected to have a notable effect on their behavior when considered across the subunits. On a local level, however, changes in cover are likely to influence individual grizzly bears in some portions of the project area. Across all of the affected Subunits, effects of these changes in cover would largely be insignificant. Bears would be able to alter their habitat use within the project area and larger Subunits to find untreated stands that provide cover.

5.1.5.2.3 Grizzly Bear Security and Displacement/Mortality Risk

Resource indicators used to evaluate effects of the project on grizzly bear security and displacement/mortality risk consist of effects to grizzly bear secure habitat (relative to the 1998 baseline or full implementation level for the Gallatin Travel Plan) and changes in TMARD and OMARD (relative to the 1998 level or full Travel Plan implementation level).

5.1.5.2.3.1 Alternative 1 – No Action

Under the No Action Alternative, there would be no effects on grizzly bear secure habitat nor would there be any changes in TMARD or OMARD.

5.1.5.2.3.2 Proposed Action

The miles of temporary road proposed for construction and the temporary effects to secure habitat and TMARD presented below are based on the most current information available and represent a combination of field verified temporary routes and temporary routes identified in the office; this set of temporary routes is generally considered the "worst case" scenario, or the maximum mileage of temporary routes that would be constructed under the project. Because sideboards (including Conservation Strategy and Forest Plan standards for projects that temporarily reduce secure habitat below baseline levels), design features, and other factors would reduce the amount of treatment that would occur in the project area, actual project impacts are expected to be lower than those presented here.

Up to 56.8 miles of temporary road would be constructed under the Proposed Action to access all of the proposed treatment units in the current stand pool. Some project routes would be constructed in areas that are already considered non-secure due to the presence of roads open to the public or administrative use. Others would create additional areas of non-secure habitat during implementation, as they would affect areas outside of the 500 meter buffer zones around existing open and administrative routes.

Figure 5 displays existing secure habitat and the effects associated with implementation of the Proposed Action on secure habitat. Table 12summarizes the effects of the Proposed Action on access management values within the three affected Subunits. The current stand pool for the Proposed Action would temporarily reduce secure habitat by 2.7% in the Henry's Lake #2 Subunit; this level would be below the baseline by 2.7%. Secure habitat in the Madison #2 Subunit would be temporarily reduced by 0.3%; the Subunit would be 0.3% below the secure habitat baseline as a result. Secure habitat in the Plateau #1 Subunit would be reduced by 1.3% from the existing condition. Secure habitat would only be reduced below baseline levels in the Henry's Lake #2 and Madison #2 Subunits; the secure habitat reduction in the Plateau #1 Subunit would not result in the Subunit dropping below the baseline level.

Table 12: Effects of the Proposed Action on secure habitat in the three affected Subunits during implementation and comparison of these values with baseline levels for each subunit and current conditions (as of 2021) for each subunit.

Subunit	Baseline[1]	Existing (2021)[2]	Implementation[3]	Difference from Baseline[4]	Difference from 2021
Henry's Lake #2	52.00%	52.00%	49.30%	-2.70%	-2.70%
Madison #2	67.40%	67.40%	67.10%	-0.30%	-0.30%
Plateau #1	68.60%	70.60%	69.30%	0.70%	-1.30%

[1] Baseline for Henry's Lake #2 and Madison #2 refers to access management values at full Travel Plan implementation. Baseline for Plateau #1 is the secure habitat level present in 1998.

[2] 2021 is the year when the analysis was completed; the most recent grizzly bear access database (2020) was used. Additional changes made since 2020 data was made available were also incorporated, including use of the "footprint" methodology for some developed sites.

[3] Values refer to those during implementation of vegetation treatments. Values would return to the existing condition at project completion when temporary project roads are effectively decommissioned.

In order to minimize the effects on grizzly bears that could occur by affecting secure habitat below baseline, the GBCS included a standard and associated application rules for habitat management with

respect to secure habitat. The GBCS standard allows for temporary reductions in secure habitat below baseline for individual Subunits, as long as a series of application rules are followed. This standard and associated application rules were incorporated into the Gallatin Forest Plan as part of the 2015 Cleanup Amendment (USDA 2015a) and were rolled over into the revised 2022 Custer Gallatin Forest Plan (USDA 2022) in their entirety. The Secure Habitat standard requires that only one project affecting secure habitat below baseline may be active within any Subunit at any one time. A portion of the Project lies in the Madison #2 Subunit. This Subunit also lies within the North Hebgen Project area. The North Hebgen Project would reduce secure habitat below the baseline when implemented. Activities on this project will be coordinated to ensure that impacts to secure habitat below baseline on the North Hebgen Project are complete and temporary roads affecting secure effectively decommissioned prior to activities affecting secure habitat below baseline in the Madison #2 Subunit within the South Plateau project area being implemented. The standard (FW-STD-WLGB-03) for temporary effects to secure habitat below baseline also states that "The total acreage of secure habitat affected within a given Bear Management Unit will not exceed 1 percent of the acreage in the largest subunit within that Bear Management Unit." This standard was incorporated into the sideboards for the South Plateau Project. If the entire existing stand pool were treated at once, the Project would not be in compliance with this Standard for the Henry's Lake #2 Subunit. As noted in Table 13 below, the reduction in secure in the Henry's Lake #2 Subunit below baseline is 1.9% of the acreage of the largest Subunit in the BMU when the entire current stand pool and set of temporary roads are factored in. Reductions in the Madison #2 and the Plateau #1 Subunits would be in compliance with the 1% Rule (see Table 13 below).

In order to be compliant with this Standard, the acreage of secure habitat affected below baseline within a Bear Management Unit would not exceed one percent of the acreage of the largest Subunit in the Bear Management Unit. In order for the Henry's Lake #2 Subunit to be compliant with the 1% Rule, this would require one or a combination of the following actions to occur:

- Drop treatment acres and associated temporary project roads to reduce the impact to secure below baseline to less than 1% of the acreage of the largest Subunit in the BMU, or
- Implement activities affecting secure habitat below baseline in the Subunit in stages (i.e. build temporary roads, complete work, and effectively decommission those temporary roads before moving to the next set of temporary roads/units affecting secure in a manner such that the impact to secure habitat below baseline never exceeds the 1%). If this option is chosen, the Standard for timing of construction/use/decommissioning of temporary roads for a project (which states that the "collective set of temporary roads that affect secure habitat below baseline levels shall be closed to all motorized use after three years. Temporary roads shall be decommissioned such that secure habitat is restored within one year after closure.") would be adhered to and implementation closely monitored. Refer to discussion of this standard below.

Table 13: Amount of secure habitat affected below baseline and the proportion of that reduction in relation to the largest Subunit in the BMU

Subunit	Baseline[1] Acres[2]	Baseline[1] %[3]	Temporary Reduction in Secure During Implementation[4] (Acres)[5]	Difference from Baseline (Acres)[6]	% of Largest Subunit[7]
Henry's Lake # 2	46,672	52.0%	2,417	-2,426	1.0%
Madison #2	64,455	67.4%	228	-248	0.2%
Plateau #1	125,685	68.6%	2,328	1,317	Not Applicable

Notes:

[1] Baseline for the Plateau #1 Subunit is the 1998 secure habitat level. Baseline for Henry's Lake #2 and Madison #2 Subunits is the secure habitat level at full travel plan implementation for those Subunits (USDI 2013).

[2] The square miles of secure habitat reported in the 2020 IGBST Annual Report (IGBST 2021) for the year 1998 (for Plateau #1) or full Travel Plan implementation (Henry's Lake #2 and Madison #2) was converted to acres, as adjusted for changes in methodology for calculating secure ("footprint" methodology, see Affected Environment section above).

[3] Reported in the 2020 IGBST Grizzly Bear Annual Report (IGBST 2021) and updated based on use of the "footprint" methodology for some developed sites. New baseline levels were calculated for the new Forest Plan Biological Assessment. Refer to the Forest Plan BA (USDA 2020) and USFWS BO (USDI 2022) for additional information regarding this new methodology.

[4] Refers to temporary effects during implementation, assuming all acres in stand pool are treated at the same time or at all. Levels will return to current levels at project completion, as all temporary roads affecting secure would be decommissioned/obliterated such that they would not be usable to motorized use.

[5] Acreages were calculated using model runs performed for this project on 10 January 2022. Proposed Action secure habitat acreage was subtracted from the existing condition of secure habitat to get acres of secure affected. Results of this model run are included in the project record.

[6] Baseline secure habitat level minus Proposed Action secure habitat level

[7] Calculated when the action will result in a temporary reduction in secure habitat below baseline. The largest subunit in the Madison BMU is 145,847 acres, the Henry's Lake BMU is 128,549 acres, and the Plateau BMU is 275,711 acres. As secure habitat in the Plateau #1 Subunit would not be reduced below the baseline level under the Proposed Action, this is Not Applicable to this Subunit. The Henry's Lake #2 Subunit would be 2,426 acres below the baseline level (resulting from a temporary reduction of 2,417 acres under the Proposed Action and an existing deficit of 9 acres below the baseline under the existing condition). This would equate to a reduction of 1.9% below the baseline level over the life of the project relative to the largest subunit in the BMU. While this is in excess of the 1% permitted in the Forest Plan, there would be no more than a 1% reduction in secure below baseline at any one time. By phasing the project and restoring secure habitat in one phase (through effective obliteration of temporary roads affecting secure) prior to moving to the next phase, the Forest will ensure that temporary effects to secure habitat below baseline never exceed the 1% threshold.

As the 1% Rule is measured at the scale of the entire BMU (not the Subunit scale), coordination with adjacent Forests will occur (i.e. the CTNF York Creek Project affecting secure habitat below baseline on up to 1% in the Henry's Lake #1 Subunit must be completed and temporary roads decommissioned prior to South Plateau affecting secure habitat below baseline in the Henry's Lake #2 Subunit). In addition, Standard FW-STD-WLGB-03 requires that the collective set of project roads that affect secure habitat below baseline levels (in a particular Subunit) will be in place and used for no more than 3 years, and that project roads will be effectively decommissioned within 1 year to restore secure habitat. All temporary project roads that would impact secure habitat below baseline in the Henry's Lake #2 and Madison #2 Subunits would be in compliance with this Standard.

Implementation of vegetative treatment activities (clearcutting, thinning, fuels treatment, etc.) would have no impacts on OMARD, as temporary project roads would be effectively closed to the general public (administrative use does not affect this parameter). The vegetative treatment portion of the project would result in temporary increases in TMARD. Table 14 below shows the project impacts on TMARD in the three affected Subunits. TMARD would increase from 0.5% to 5.7% in the affected Subunits, assuming that all of the proposed temporary project roads would be constructed and used at the same time. This would not be the case in the Henry's Lake #2 Subunit, as the Forest Plan Standard and Conservation Strategy Application Rules for temporary impacts to secure habitat below baseline limit the temporary impacts to secure to one percent of the acreage of the largest Subunit in the Bear Management Unit. As either treatment (and associated temporary project roads) would be dropped, or treatment and temporary road construction/use would be done in stages, impacts to TMARD are expected to less than displayed in Table 14. Given that TMARD values are dependent on the densities of roads open to motorized use, and it is unknown what temporary project roads would be in use at what time, the worst case scenario (representing TMARD values if all temporary roads were constructed and used at the same time) is shown in Table 14. Under this scenario, TMARD would temporarily increase above the existing level but would be maintained below 1998 levels in the Henry's Lake #2 and Madison #2 Subunits. TMARD in the Plateau #1 Subunit would temporarily be above the existing and 1998 level under this scenario. Existing TMARD and impacts on TMARD associated with implementation of the Proposed Action are displayed in Figure 6.

Table 14: Effects of the Proposed Action on TMARD in the three affected Subunits during implementation and comparison of these values with 1998 levels for each subunit, and current conditions (as of 2021) for each subunit.

Subunit	1998 Level[1]	Existing (2021)[2]	Implementation[3]	Difference from 1998	Difference from 2021
Henry's Lake #2	35.2%	28.1%	33.8%	-1.4%	+5.7%
Madison #2	24.0%	21.6%	22.1%	-1.9%	+0.5%
Plateau #1	12.9%	10.3%	13.7%	+0.8%	+3.4%

Notes:

[1] There is no baseline level for TMARD; the 1998 level is provided for context. TMARD is reported as the proportion of the subunit that exceeds a total road density of 2 mi/mi^2.

[2] 2020 is the most recent year for which access data is available; updates have been incorporated into the database since this last release to provide the most up-to-date existing condition possible.

[3] Values refer to those during implementation of vegetation treatments. Values would return to the existing condition at project completion when temporary project roads are effectively decommissioned.

Disturbance associated with project activities throughout the proposed treatment areas could result in bears moving to adjacent areas in the subunits with less disturbance while implementation is occurring. As stated previously, the IGBST has established that the project area is located within the home range of a substantial number of grizzly bears and that the project area has long been used frequently and consistently by all cohorts of grizzly bears (Karabensh et al. 2019). The amount of displacement would vary across the project area, depending on the timing, extent, type of treatment, and amount of use on forest roads. It is expected that bears would avoid roads receiving moderate to high traffic (>20 trips per day) and may shift use patterns to be more active at night (Northrup et al. 2012). Based on the typical way operations occur and the limited number of operators in this area, it is not likely that operations would occur across the project area all at once. Implementation would likely occur under several individual timber sales. These sales would be implemented in portions of the project area in the shortest timeframe possible before they move into new areas. Displacement would, therefore, be limited in extent at any one time. While short-term disturbance of grizzly bear would occur during implementation to some degree (dependent on site factors such as screening vegetation, distance to roads, and type of treatment that occurs), it would be temporary. Once activities are completed, associated disturbance ends, and temporary roads are effectively decommissioned, bears would again utilize these areas.

Temporary project impacts would have localized effects on individual grizzly bears. Temporary reductions in secure habitat and temporary increases in TMARD may result in displacement of grizzly bears from areas where road use is occurring, and bears may retreat to less disturbed areas across the subunits during project implementation. While bears may move in response to proposed treatments (and associated temporary reductions in secure habitat and increases in TMARD), grizzly bears operate at a landscape level in the GYE. Given the temporary nature of silvicultural projects, bears can accommodate this at the project level, even at higher densities, by adjusting their spatial and/or temporal use patterns within their home range (van Manen 2016, personnel communication) and within the larger Subunits. Grizzly bear space use is very fluid and dynamic; there is a high degree of overlap among home ranges. The dietary plasticity of the grizzly bear allows it to occupy diverse habitats over large spatial scales and to cope with perturbations in the abundance of food (Gunther et al. 2014 pg. 69). Research suggests that in response to changes in food availability grizzly bears will shift their use to other available forage items within their home range (Costello et al. 2014). Suitable alternate habitats are widely available in the

immediate vicinity of treatment units located in the Madison #2, Henry's Lake #2, and Plateau #1 Subunits. Untreated areas outside of mapped treatment units as well as areas that would not be treated inside boundaries of proposed units (e.g. dropped due to the 40-acre maximum size of clearcuts or to provide at least 500 feet between regeneration harvested stands; see Design features) would be available for foraging during implementation. Created openings, thinned stands, and untreated areas would contribute to a mosaic of habitat conditions and potential food resources for grizzly bears post-implementation.

In the Henry's Lake #2 Subunit, the area immediately adjacent to private land and other values at risk would be treated more intensively to reduce the risk of wildfire in these areas and provide for defensible space and firefighter and public safety. Bears moving in response to these activities would have to move south or north to higher elevation areas in the Henry's Mountain Range. As heavy bear use in that area generally occurs in the early spring/summer and late fall, activities would potentially result in avoidance for a relatively short period of time, as there would be no operations during the winter season and operations during spring break-up and late fall are also unlikely given ground conditions during these time periods. Winter harvest would not occur in the SPLAT Project. Snow plowing, harvest, and hauling would not be allowed between November 1 and April 30. Vegetative treatment activities would also not be allowed in big game winter range between December 1 and April 30 to protect wintering big game (elk and moose). Should any treatment (i.e. activities other than timber harvest/haul/plowing such as small diameter thinning, some fuels treatments) occur after November 1, impacts to denning activities are expected to be minor given that this would likely occur at the lowest elevations in the project area for a short period.

Because increased access has been shown to increase mortality risk to grizzly bears, the temporary reduction in secure habitat and temporary increase in TMARD in the three affected Subunits through implementation of vegetative treatments indicates that the project has the potential to increase mortality risk to individual grizzly bears. Increased human presence in the project area increases the potential for conflicts between humans and grizzly bears. Under the Proposed Action, treatment activities are fairly widespread in the affected Subunits. While this increase in human activity may increase the likelihood of chance encounters or negative interactions, design features would be enforced to reduce this potential. Use of project roads would be restricted to administrative access; these temporary project routes would be effectively closed to the general public during implementation and decommissioned once they are no longer used for implementation. In addition, the Custer Gallatin food storage order would be implemented and enforced for all activities associated with this project (applies to agency personnel, operators, contractors, etc.), so the risk of conflicts would be minimized. In addition, disturbance from project activities would move bears away from the area, so the risk of a surprise encounter would likely be reduced in areas where implementation is actively occurring.

Ongoing recreational use of decommissioned temporary project roads and/or skid trails, especially by ungulate hunters, could have a longer-term effect on increased mortality risk for grizzly bears. This use would be non-motorized. Because ungulate hunting has been found to negatively affect grizzly bear survival (Schwartz et al. 2010), this longer-term increased access for hunters may result in more negative encounters with grizzly bears over time. The proposed treatment activities are not expected to appreciably impact human use in the area. While motorized use on open routes is relatively high during the non-denning season, other uses, including hunting, fishing, and hiking are less popular than other areas on the District.

Under the Proposed Action, changes in the access designation of Roads 478, 1704, 6786, 1752, 2543A, 2543B, 1704B, 1756, and 1756-N would permanently alter grizzly bear habitat in the Henry's Lake #2, Madison #2, and Plateau #1 Subunits. The lower portion of the South Fork Madison River Road (478) has

been identified as a source of sediment to the South Fork Madison River. The road is also situated in the riparian area utilized by a number of species including grizzly bears, moose, and elk due to the availability of water and green forage. The SPLAT Project would close and decommission and/or obliterate a segment of Road 478 (currently open to the public) and open a portion of two administrative roads (1704 and 6786) in the uplands to public use to provide continued public access, including a connection to the adjacent Caribou-Targhee National Forest. These changes would alleviate sediment concerns, remove motorized use along approximately 2.7 miles of riparian area adjacent to the South Fork Madison River, and maintain public opportunities for accessing the Reas Pass area. These changes would likely result in avoidance of the section of the 1704 and 6786 roads during the non-denning season due to expected traffic volumes. Conversely, elimination of traffic on the 478 road through obliteration would eliminate disturbance along this section of the South Fork Madison River, which currently receives high levels of traffic during the non-denning season.

The 1752 road (currently open to the public) would be closed to public use, but would remain open for periodic administrative use (including activities permitted under special use authorizations). Three additional roads (1704B, 2543A, and 2543B) currently open to administrative use in the Henry's Lake #2 Subunit were identified as roads not necessary for the administration of NFS lands. These roads (administrative routes totalling about 5.5 miles) would be decommissioned and/or obliterated to improve grizzly bear secure habitat conditions in this Subunit. These access changes would be implemented once project activities using these routes are completed. These proposed access changes are displayed in Figure 7.

Overall, the changes in access designations would consolidate motorized use, as approximately 8.2 fewer miles of road would be available for motorized travel (public and administrative). Corrections in the grizzly bear access database to match the road system currently in use would also result in a reduction in motorized routes open to administrative and public use of approximately 0.28 miles. As noted, this change would reflect what is currently present on the ground, so while calculations show a minor improvement in secure habitat, TMARD, and OMARD, they actually represent the current condition on the ground. The proposed access changes would result in a permanent increase in secure habitat in the Henry's Lake #2 Subunit of approximately 1,109 acres. Three new areas providing secure habitat would be created; they would be 62.5 acres, 441.5 acres, and 604.9 acres in size. There would also be an increase in secure habitat in the Madison #2 Subunit of approximately 16.4 acres; this represents a modest improvement that would not change the overall percent of the Madison #2 Subunit that provides secure habitat. These changes would improve the environmental baseline (existing condition) in the Henry's Lake #2 and Madison #2 Subunits, both of which have been identified as needing improvement with respect to secure habitat. This permanent improvement in secure habitat is displayed in Figure 8. Permanent impacts to Secure, TMARD, and OMARD are displayed in Tables 15, 16, and 17 below.

Table 15: Permanent effects of the Proposed Access Changes (Implemented After Vegetation Treatments) on Secure in the three affected Subunits and comparison of these values with baseline and existing (2021) levels for each subunit.

Bear Management Subunit	Baseline[1]	Existing (2021)	Secure Post-Access Changes	Change from Baseline	Change from Existing
Henry's Lake #2	52.0%	52.0%	53.2%	+1.2%	+1.2%
Madison #2	67.4%	67.4%	67.4%[2]	No Change[2]	No Change[2]
Plateau #1	68.6%	70.6%	70.6%	No Change	No Change

[1] Baseline for Henry's Lake #2 and Madison #2 refers to access management values at full Travel Plan implementation. Baseline for Plateau #1 is the secure habitat level present in 1998. Baseline levels are slightly different than those used in previous planning efforts due to changes in secure habitat delineation methodology used in the 2022 Forest Plan.

[2] While no change in the overall percentage in secure habitat is apparent using a single decimal point, there would be an increase in secure of 16.4 acres in the Madison #2 and 18.1 acres increase in the Plateau #1 following implementation of access changes.

Table 16: Permanent effects of the Proposed Access Changes (Implemented After Vegetation Treatments) on OMARD in the three affected Subunits and comparison of these values with 1998 and existing (2021) levels for each subunit.

Bear Management Subunit	1998 Level	Existing (2021)	OMARD[2] Post-Access Changes	Change from Existing	Meets Full Travel Plan Implementation Level[1]?
Henry's Lake #2	49.9%	40.6%	41.3%	+0.7%	Yes
Madison #2	33.7%	32.0%	31.7%	-0.3%	Yes
Plateau #1	22.2%	19.0%	18.9%	-0.1%	NA

[1]Full Travel Plan implementation levels for the Madison #2 and Henry's #2 Subunits is 32.0% and 41.3%, respectively.
[2] OMARD is defined as the proportion of the subunit with motorized route densities (including only those routes open to the public during the season when bears are active) that exceeds 1 mi/mi^2.

Table 17: Permanent effects of the Proposed Access Changes (Implemented After Vegetation Treatments) on TMARD in the three affected Subunits and comparison of these values with 1998 and existing (2021) levels for each subunit.

Bear Management Subunit	1998 Level	Existing (2021)	TMARD[2] Post-Access Changes	Change from Existing	Meets Full Travel Plan Implementation Level[1]?
Henry's Lake #2	35.2%	28.1%	26.1%	-2.0%	Yes
Madison #2	24.0%	21.6%	21.6%	No Change[3]	Yes
Plateau #1	12.9%	10.3%	10.2%	-0.1%	NA

[1] Full Travel Plan implementation levels for the Madison #2 and Henry's #2 Subunits is 21.7% and 30.5%, respectively.
[2] TMARD is defined as the proportion of the subunit with total motorized route densities (including roads open to the public and administrative routes used during the season when bears are active) that exceeds 2 mi/mi^2.
[3] While no change in the overall TMARD percentage is apparent using a single decimal point, TMARD would decrease (improve) slightly from 21.6025% to 21.5846% in this Subunit following implementation of access changes.

While a permanent increase in OMARD in the Henry's Lake #2 Subunit would occur, OMARD would permanently be reduced in the Madison #2 and Plateau #1 Subunits and TMARD permanently reduced in the Henry's Lake #2 and Plateau #1 Subunits. Although not apparent in Table 17 there would also be a very slight reduction in TMARD in the Madison #2 Subunit. These permanent impacts to OMARD and TMARD are displayed in Figures 9 and 10. Because increased access has been shown to increase mortality risk to grizzly bears, the permanent change in OMARD in the Henry's Lake #2 Subunit may slightly increase mortality risk to individual grizzly bears to a small degree. Reductions in TMARD in the Henry's Lake #2 Subunit (and very small reductions in TMARD in the Madison #2 Subunit) and the reduction in OMARD in the Madison #2 Subunit indicate that mortality risk would be reduced to some degree as a result of these access changes. Overall impacts to potential mortality of individual grizzly bears as a result of these changes are expected to be neutral or decrease, as there would be an overall reduction in routes available for motorized use. The proposed permanent changes related to access designations in the Henry's Lake #2 and Madison #2 Subunits would meet or be better than the full Travel Plan implementation level identified in the 2013 Amended ITS for the Travel Plan (USDI 2013). For this reason, the expected impacts associated with this change are within the range of impacts and incidental take analyzed in the 2013 Amended ITS (USDI 2013).

5.1.5.3 Cumulative Effects of the Proposed Action

5.1.5.3.1 Food and Seasonal Foraging Habitat Quality

Past actions that have affected grizzly bear food and seasonal foraging habitat include timber harvest on public land (Lonesomewood 2 and North Hebgen), willow enhancement treatments to improve riparian areas, wildfires (including the 2016 Maple and Boundary Fires), prescribed burns, noxious weed control, wildlife habitat enhancement activities, and bison management. Whitebark pine stands have been reduced due to the combined effects of insect and disease and fire suppression, which has reduced forage opportunities across the Madison #2, Henry's Lake #2, and Plateau #1 Subunits. The Maple Fire burned a portion of the Madison #2 Subunit in Yellowstone National Park in 2016. The fire created or enhanced habitat heterogeneity and complemented a mosaic of habitat conditions. Forage for bear and potential prey (elk and other large ungulates) will be enhanced post-fire through mortality of dense regenerating conifers (allowing grass and forb production) and consumption of above-ground litter (stimulating sprouting of grasses, forbs, and shrubs). Within the analysis area, the Forest Service has completed implementation of the Rendezvous Ski Trails Project, Buffalo Summer Home Project (CTNF), and the Lonesomewood 2 Project, which were designed to address forest health and insect concerns and alter fuels and fire conditions in specific areas. Wildlife habitat enhancement included installation of water guzzlers to improve the distribution of water (and wildlife) in the Flats portion of the Madison #2 Subunit.

Wildfires are expected to also occur into the future. Past and future timber harvest, wildfires, and prescribed burns activities have had and will continue to have mixed effects on food and seasonal foraging habitat at the local level for grizzly bears and their prey. In some cases, these events have created conditions favorable for stimulating understory vegetation, which increases food and foraging opportunities. In some cases, however, where ground disturbance has been more severe or where fires have burned at extreme temperatures, the return of understory vegetation has been prolonged or inhibited. These types of events will continue to have similar effects into the future across the landscape. The North Hebgen Project would also occur in the Madison #2 Subunit in the future. This project includes vegetative treatment (regeneration harvest and thinning) designed to promote resilience to insects, disease, and wildfire. These activities would generally improve seasonal foraging habitat quality by promoting growth of herbaceous vegetation and shrubs and maintaining or improving the health of aspen stands in the Madison #2 Subunit.

Ongoing treatments in riparian areas have enhanced conditions for willow by reducing competition with incoming conifers. These treatments have improved riparian habitats. Ongoing noxious weed control has protected native understory vegetation, which enhances biodiversity and broadens foraging opportunities for grizzly bears and their prey. Bison management activities have variable impacts on foraging opportunities for grizzly bears. A portion of the Madison #2 Subunit lies within the Governor's expanded tolerance zone for bison; currently, hazing of bison only occurs when bison are present outside the year-round tolerance zone (after May 15) in order to ensure spatial and temporal separation between bison and domestic cattle on private and NFS lands. As a result, bison are provided a greater opportunity to use National Forest System lands year-round. Bison hunting (Montana FWP and Tribal entities) is occurring in the analysis area, and affects the distribution of bison and the availability of forage (calves and carcasses).

Cumulatively, all of the actions listed above in addition to implementation of any of the Proposed Action, would result in mixed effects on grizzly bear food and seasonal foraging habitat quality. In general, this project would benefit grizzly bear food and seasonal habitat quality by creating a mosaic of stand

structures and compositions and promoting the growth of herbaceous vegetation and shrubs utilized by grizzly bear.

5.1.5.3.1.1.1 Ungulate Displacement

Other projects in the analysis area (Henry's Lake #2, Madison #2, and Plateau #1) that have had temporary impacts on ungulate distribution include the Lonesomewood 2, Bighorn (CTNF), and Rendezvous Trails Thinning Projects. As these projects have been completed, they are having no residual impacts with regard to ungulate displacement. Future projects include the North Hebgen Project and the Black Mountain salvage project (CTNF). These projects would result in temporary impacts to ungulates in the Madison #2 and Henry's Lake #2 Subunits; displacement or other avoidance of project activities would be temporary. A variety of factors affect how ungulates use the landscape within the affected Subunits in space and time. Food availability, human presence, predator cycles, time of year, and climate all play a role in determining the presence of ungulates in a given place or at a given time. Cumulatively, this project would add to any factors that currently displace or are likely to displace ungulates in the future. Mule deer and elk already avoid roaded areas and human activities, especially during hunting season, so this project would further displace animals from treatment units, which are all adjacent to already roaded areas. These effects would be limited to the duration and extent of project activities. At the scale of the three affected Subunits, the effects of this project would have a relatively minor cumulative effect on the overall landscape distribution of big game herds when combined with other future projects in the analysis area. Grizzly bears would be able to adjust to these changes and alter their foraging patterns to match any shifts in ungulate distribution resulting from project implementation.

5.1.5.3.1.1.2 Whitebark Pine

The current condition for whitebark pine described earlier took into account the past and current activities affecting this valuable food resource for grizzly bears. As also discussed in that section, whitebark pine in the GYE is declining due to the combined effects of white pine blister rust, mountain pine beetle, and lack of fire. Whitebark pine stands in the project area are generally restricted to the upper elevations of the Henry's Lake #2 and Plateau #1 Subunits. Whitebark pine presence in the Madison #2 Subunit is very limited. The North Hebgen Project also lies within the Madison #2 Subunit. The beneficial effects of the proposed treatments on whitebark pine will slightly diminish the overall decline of whitebark in the three affected subunits. The scale at which treatments will take place is very small when compared to the affected Subunits. Other than minor impacts associated with the portion of the North Hebgen Project in the Madison #2 Subunit (where whitebark presence is highly limited), there would be up to 72 acres affected in potential whitebark stands under the proposed action. As a result, the cumulative impact would be negligible.

5.1.5.3.1.1.3 Aspen

Lack of wildfire has resulted in conifer encroachment in aspen stands where they occur in the Subunits. Past aspen restoration activities in the analysis area include thinning (commercial and non-commercial) of encroaching conifers in the Lonesome Wood 2 Project in the Henry's Lake #2 Subunit and felling of competing conifers in the Edwards Peninsula area in the Madison #2 Subunit. Future actions to benefit aspen would include approximately 750 acres of conifer encroachment thinning in the North Hebgen Project, primarily in the vicinity of Horse Butte (Madison #2 Subunit). Cumulatively, the proposed treatments (178 acres of aspen enhancement) would slightly diminish the overall decline of aspen on the landscape. The scale at which treatments will affect aspen is very small when considered in the context of the entire analysis area. Individual grizzly bears that use these aspen stands would benefit, primarily in the Henry's Lake #2 Subunit, due to increased foraging opportunities associated with these stands.

5.1.5.3.1.1.4 Riparian Areas

The South Plateau Project would allow vegetative treatment in the inner riparian zone where the purpose is to restore or enhance the ecological integrity of aquatic and riparian-associated resources. The Lonesome Wood 2 and North Hebgen Projects were designed to largely exclude riparian areas from proposed units; where Class 1 and 2 riparian areas occurred in units, a minimum 15 foot no-cut buffer was applied. There may be a cumulative impact to forested cover in riparian areas. Treatment would promote the growth of grasses, forbs, and shrubs that would provide grizzly bear forage. The function of riparian habitat would be maintained regardless of whether treatment occurs in these areas or not.

5.1.5.3.1.1.5 Forest Understory Vegetation

Activities occurring under the Lonesome Wood 2 Project, Bighorn Project (CTNF), and Rendezvous projects enhanced understory vegetation by thinning dense stands or creating openings in the forested canopy. The North Hebgen Project would also thin or create openings in forested stands that would improve understory vegetation conditions. Cumulatively, the project would add to grizzly bear foraging opportunities in the forest understory by thinning the overstory or creating openings. Growth of grasses, form, and shrubs would be stimulated by thinning dense overstory canopies. Forage in these treated areas would compliment forage that is avaialbe in untreated areas in the three affected Subunits.

5.1.5.3.2 Denning Habitat

Past and current actions that have affected denning habitat include timber harvest on public land and wildfires (including the 2016 Maple Fire in Yellowstone NP). Snowmobiling is a popular winter recreation activity in both subunits. The number of participants has grown over time, as well as the extent of the areas that can be accessed, due to improvements in machine capability and technology. While it was determined that snowmobile activity was not appreciably reducing the likelihood of survival or recovery of grizzly bears across the GYE forests, localized effects may reduce suitability of certain areas for denning.

Snowmobiles may reduce suitability of ares for denning

Suitable denning habitat in the Madison #2 Subunit was reduced by the 1988 wildfires and the 2016 Maple Fire. Effects of the Maple Fire on denning habitat have not been quanitified; it likely caused the temporary loss of suitable grizzly bear denning habitat to a small degree. As the fire burned in a heterogeneous pattern across the landscape, it is likely that patches of denning habitat continue to be available in the burn area in close proximity to unburned and burned foraging habitat. Denning habitat in the Madison #2 has also been affected by the Rendezvous Thinning project. While not quantified in the Rendezvous analysis, approximately 18 acres of denning habitat was thinned under this project (when potential denning habitat was overlaid with the project units). The North Hebgen Project would also affect a small number of acres (107 acres) of denning habitat in the Madison #2 Subunit. Within the Henry's Lake #2 Subunit, The Lonesome Wood 2 Project and Bighorn Thinning Project (CTNF) affected approximately 1,417 acres and 146 acres, respectively (project units were overlaid with potential denning habitat). In the Plateau #1 Subunit, only the Black Mountain Blowdown Salvage project would affect potential grizzly bear denning habitat. Salvage would occur on approximately 15 acres under this project. When the impacts associated with the proposed South Plateau Project (which are likely greater than actual impacts that would occur on the ground due to sideboards, design features, and other requirements that will reduce the number of acres treated) are combined with those of past, ongoing, and reasonably foreseeable future actions in the affected Subunits, there would be a total of 7,960 acres, 759 acres, and 7,066 acres of denning habitat affected in the Henry's Lake #2, Madison #2, and Plateau #1 Subunits, respectively. This would represent 12.3%, 3.4%, and 5.8% of the denning habitat in the Henry's Lake #2, Madison #2, and Plateau #1 Subunits, respectively. As noted previously, these estimates are high due to the fact that proposed treatment units would drop in order to meet project sideboards, design features, and

other requirements. Undisturbed potential denning habitat would be available, and well-distributed in the Subunits post-implementation.

Because human use in the areas proposed for treatment may already reduce the suitability of these areas for denning, the additional impacts of this may render these areas even less desirable to bears for denning.

5.1.5.3.3 Grizzly Bear Secure Habitat and Displacement/Mortality Risk

Past actions that have caused temporary displacement and increased mortality risk include past timber harvests (thinning, sanitation, salvage and regeneration harvests) and other vegetation management activities and associated temporary road construction and use. System roads constructed for these projects that are now part of the road system (open to the public and administrative use roads) are affecting grizzly bears and are accounted for in the baseline or existing condition in the three affected Subunits. Implementation of these activities (and construction, use, and ultimately decommissioning of temporary roads) no longer has direct or indirect effects on displacement and increased mortality risk once they are completed. Some old logging roads continue to be used for non-motorized access by hunters and other recreationists, despite their being closed for motor vehicle travel, and increased access can impact grizzly bears by increasing risk of mortality due to negative encounters. In the future, the North Hebgen Project would affect secure habitat and potentially displace grizzly bears during implementation in the Madison #2 Subunit. The Black Mountain salvage project would potentially cause displacement or avoidance during implementation in the Plateau #1 Subunit; as no temporary roads would be constructed, there would be no impacts to secure habitat. The West Yellowstone to Reas Pass Rail-to-Trail Project would have a slight temporary reduction in secure habitat (12.5 acres) in the Plateau #1 Subunit during build-out of the non-motorized trail. This temporary reduction in secure would not reduce secure habitat below the baseline level for the Subunit. This trail, as well as other non-motorized recreation in the Subunit may result in disturbance to individual bears and result in potential bear-human conflics in the future. Naidoo and Burton (2020) found in their study area that recreational mountain biking resulted in avoidance of impacted trails by grizzly bears.

Road and trail use and maintenance have impacted and will continue to impact grizzly bears through displacement and mortality risk. Travel plan implementation has improved conditions for grizzly bears, with reduced road densities and increased levels of secure habitat in the affected Subunits. Current conditions meet baseline levels of secure and are consistent with full travel plan implementation levels for other parameters (OMARD and TMARD). Activities on public lands such as recreational use, outfitter and guide trips, dispersed camping, hunting, and a variety of other activities likely have increased displacement of bears from certain areas and increased mortality risk for bears where they occur, due to the higher likelihood of negative human/bear interactions.

Some actions are more permanent in nature and have likely displaced grizzly bears on a longer term basis. These include developed recreation sites; state, county, and private roads; and commercial and residential developments on both public and private lands. Grizzly bear demographic recovery (Interagency Conservation Strategy Team 2016) took place after much of this development was already in place in the Subunits.

Grizzly bear-human conflict is the primary source of known grizzly bear mortality, with self defense and management removals of bears involved in bear-human conflicts being the two primary causes of human induced bear mortality. Other sources are illegal kills, electrocution by downed power lines, mistaken identification by black bear hunters, and vehicle strikes. A primary focus of the grizzly bear recovery effort has been the management of mortality levels. Studies have shown a direct correlation between road access and bear mortalities attributed to illegal killing and management removals of food conditioned

and/or habituated bears from developed areas (Mace et al. 1996). A Food Storage Order is now in effect covering that portion of the forest where grizzly bears may be present, and proper storage of food/attractants has been regulated in the grizzly bear recovery zone for many years. Management of human related attractants has had a notable effect in reducing the number of bear-human conflicts in the GYE.

Because secure habitat is discussed in context of Bear Management Subunits, the discussion of direct and indirect effects on secure habitat was based on the effects of this project in addition to all other activities that already affect secure habitat. These past activities combined to create the existing condition of secure habitat in the analysis area. The grizzly bear population grew robustly and met recovery goals during this period despite numerous activities that had temporary and permanent impacts to secure habitat. The North Hebgen Project would affect secure habitat in the Madison #2 Subunit in the future. As only one project may reduce secure habitat below baseline in a Subunit at one time, activities proposed under this project in the Madison #2 Subunit would not occur until after activities on the North Hebgen Project have ceased and temporary project roads affecting secure habitat below baseline are effectively decommissioned (or vice-versa) and therefore would not have a cumulative impact on displacement. Ongoing activities on private lands in the Madison #2, Henry's Lake #2, and Plateau #1 Subunits that may continue in the future include residential development and occupancy, firewood gathering, and recreational activities. These activities would generally be expected to occur in areas that are already avoided by grizzly bear. For this reason, it is unlikely that bears would avoid these areas to a greater degree than is currently occurring. Overall, the temporary impacts to secure habitat associated with vegetation management activities under this project and the minor permanent increase in secure habitat associated with post-implementation access changes, would combine with expected developments on private lands to increase displacement of grizzly bears to a small extent.

In addition to the past, present, and foreseeable actions that have displaced and are expected to continue to displace grizzly bears across the analysis area, activities associated with this project would likely further temporarily displace grizzly bears into less developed areas and more secure habitat in the Subunits. Effects would be limited to the duration of project activities and the extent of areas where operations are occurring (and temporary roads are constructed/used). The spatial scale at which project activities would take place is very small in relation to the scale at which grizzly bears operate across the landscape, and displaced individual bears would be able to seek out more secure areas for breeding, foraging, and sheltering within their home ranges. The permanent increase in OMARD in the Henry's Lake #2 Subunit would be countered by the permanent reduction in OMARD in the Madison #2 and Plateau #1, permanent reduction in TMARD in the Henry's #2 and Plateau #1 Subunits, and the permanent increase in secure habitat in the Henry's #2, Plateau #1 and Madison #2 Subunits. Overall mortality risk is expected to decrease in the long term.

Cumulatively, the project would add to overall mortality risk to bears across the Subunits because it would add to the overall potential for bears to interact with humans due to the increase in human activity during implementation. Potential conflicts would be minimized through implementation of the CGNF food storage order. This increased mortality risk would largely subside after implementation is completed and be reduced after implementation of permanent access changes. Use of decommissioned temporary project roads by hunters would continue to result in an unknown increase in mortality risk for some period into the future.

5.1.5.3.4 Summary

For all aspects of grizzly bear habitat discussed, there could be combined impacts from project related activities and other past and ongoing activities. However disturbance impacts would be temporary and

limited to the duration of project activities and the extent of areas where operations are occurring. The spatial scale at which project activities would take place is relatively small in relation to the scale at which grizzly bears operate across the landscape. In all cases, combined effects to habitat would have localized effects on individual grizzly bears but grizzly bears would be expected to adapt to those changes and disturbances. At the scale of individual Subunits grizzly bear would be able to cope with disturbance. By meeting the secure habitat standard and the application rules in individual bear management subunits, there would be no substantial impacts at either the Subunit or larger scales (e.g. adjacent Bear Management Units). Meeting the secure habitat standard at the subunit level is key to maintaining carrying capacity for bears at the ecosystem level (van Manen, 2016, personal communication). Grizzly bear demographic recovery occurred across the recovery zone and within the Henry's Lake, Madison, and Plateau BMUs in the context of all these [past and ongoing] actions (Interagency Conservation Strategy Team 2016), including thinning, sanitation, salvage, and regeneration harvests in the South Plateau project area. The South Plateau Project would comply with direction in the Conservation Strategy, which is recognized as incorporating the best and most current science with respect to grizzly bear management.

5.1.6 Consistency with FP direction specific to grizzly bear

Table 18 lists the FP standards that are specific to grizzly bear habitat management. It also shows how the Proposed Action would be in compliance with those standards. When standards were used as project sideboards or design features, as they were with respect to managing for grizzly bear secure habitat, further detail is provided in the effects analysis.

Table 18: FP standards specific to grizzly bear habitat management and how the project complies with those standards.

Standard/Guideline	Compliance
FW-STD-WL-01 A food and attractant storage special order shall apply to the Absaroka Beartooth Mountains; Bridger, Bangtail, and Crazy Mountains; Madison, Henrys Lake, and Gallatin Mountains, and Pryor Mountains Geographic Areas.	A valid food storage order is in place in the proposed project area. Compliance with the food storage order will be required of all contractors and Forest personnel during all project-related activities.
FW-GDL-WL -01 To maintain or restore habitat connectivity for wildlife, management actions should not create movement barriers to wide-ranging species such as medium to large carnivores and wild ungulates, except where necessary to provide for human or wildlife safety.	The project would not create barriers to the movement of wide-ranging wildlife species or ungulates. While wildlife may avoid some areas during implementation, project activities would pose a temporary impediment to movement for some species. As project activities would be spread across the project area over time, areas with less/no disturbance and areas outside the project area would provide for connectivity during implementation. Post-implementation, the mosaic of treated and untreated habitat would provide for wildlife movement across the landscape.

Standard/Guideline	Compliance
FW-STD-WLGB-01 Inside the recovery zone/primary conservation area, management actions shall not reduce the percent of secure habitat in each bear management subunit below 1998 baseline levels. For subunits identified in the 2007 Conservation Strategy as needing improvement above 1998 levels (Gallatin #3, Henrys Lake #2, and Madison #2), management actions shall not reduce the percent of secure habitat below levels attained from full implementation of the 2006 Gallatin National Forest Travel Management Plan. See glossary: baseline levels for grizzly bears, and plan appendix F for secure habitat values. Management actions that result in temporary or permanent reduction of secure habitat below the applicable baseline are allowed so long as they follow the application rules listed in standards FW-STD-WLGB 02 and 03 below.	There would be no permanent changes to secure habitat below baseline levels (1998 or full implementation level of the Gallatin Travel Plan) under this project. Temporary effects to secure below baseline levels would occur in the Henry's Lake #2 and Madison #2 Subunits; these temporary effects would be consistent with FW-STD-WLGB-03. Permanent changes to secure habitat would also occur in all three Subunits; all changes would be consistent with FW-STD-WLGB-02.

Standard/Guideline	Compliance
FW-STD-WLGB-02 Permanent Changes in Secure Habitat. Construction of new motorized routes (roads or trails), reconstruction of existing motorized routes, or opening of a previously decommissioned motorized route inside the recovery zone/primary conservation area shall meet the following conditions: a. Replace any loss in secure habitat below baseline levels by restoring secure habitat of equivalent quality and quantity (such as through decommissioning) in the same bear management subunit. Habitat quality must be assessed based on the best collective scientific understanding of grizzly bear habitat ecology and the rationale for all mitigation measures must be fully documented. b. Replacement habitat must be in place before project implementation or concurrent with project development as an integral part of the project plan. Replacement habitat must remain in place for a minimum of 10 years (the approximate generation time of a female grizzly bear, or the time it takes to replace herself in the population). c. Emergency repairs, replacements, or realignments of existing forest system roads or trails, power lines, utilities and/or associated infrastructure shall be made in the nearest suitable location to the damaged facilities when replacement within the existing alignment is not feasible due to natural hazards such as landslides, slumps, or other conditions that render the original location unsafe or unsuitable for the intended structure. d. For activities based on statutory rights, such as the 1872 General Mining Law, where permanent reductions in secure habitat cannot be replaced within the affected subunit, then secure habitat must be compensated at a commensurate level at or above the baseline in the nearest possible subunit. Subsequent changes to secure habitat in the two affected subunits will then constitute permanent changes to the baseline. e. Proposed applications for permit to drill and operating plans within existing oil and gas leases or mine locations, shall meet the application rules for changes to secure habitat. New leases, applications for permit to drill, and operating plans shall meet the secure habitat standards.	There would be no permanent changes to secure habitat below baseline levels (1998 or full implementation level of the Gallatin Travel Plan) under the proposed project. Access designation changes would result in a 1,109 acre increase in secure habitat in the Henry's Lake #2 Subunit, a 16.4 acre increase in secure habitat in the Madison #2 Subunit, and an 18.1 acre increase in secure in the Plateau #1 Subunit. The Madison #2 and Henry's Lake #2 Subunits were identified as Subunits in need of improvement in the secure habitat conditions. As there would be no permanent changes to secure habitat below baseline levels (1998 or full implementation level of the Gallatin Travel Plan), parts (a) through (e) of standard FW-STD-WLGB-02 are not applicable. Replacement habitat would not be required under the proposed action. Access changes would be implemented when the project is complete or is largely complete in order to reduce potential safety hazards, to allow for completion of project activities along the affected routes, to provide sufficient time to install effective closure devices at the 1704-6786 junction & 1752 road, and implement decommissioning/obliteration of the lower portion of the 478 road.

FW-STD-WLGB-03 Temporary Changes in Secure Habitat. Inside the recovery zone/primary conservation area, project activities shall meet the following conditions for temporary reductions in secure habitat below baseline: a. Only one project affecting secure habitat below baseline values may be active within a given bear management subunit at any one time. b. Total acreage of secure habitat below baseline values within a given bear management unit shall not exceed 1 percent of the acreage in the largest subunit within that bear management unit. The acreage of a project that counts against the 1 percent limit (for example the amount of secure habitat affected) is measured as the acreage within the 500-meter buffer around any temporary motorized access route or low-level helicopter flight line that intrudes into existing secure habitat. c. New temporary roads shall be limited to administrative purposes associated with project activities. Project activities shall not reduce secure habitat below baseline levels for more than four consecutive years. The collective set of temporary roads that affect secure habitat below baseline levels shall be closed to all motorized use after three years. Temporary roads shall be decommissioned such that secure habitat is restored within one year after closure.	The South Plateau Project would not reduce secure habitat in the Plateau #1 Subunit below baseline, so this Standard would not apply to this Subunit. Secure habitat would be affected below baseline in the Madison #2 and Henry's Lake #2 Subunits. No other project activities affecting secure habitat below baseline will be implemented in these subunits until activities affecting secure habitat below baseline are completed and temporary project roads effectively decommissioned. This was included as a project sideboard. The North Hebgen Project would also affect secure habitat below baseline in the Madison #2 Subunit. Activities affecting secure habitat below baseline in this Subunit would not occur on these projects at the same time in order to be consistent with this Standard. In the Madison #2 Subunit, secure habitat would be reduced 248 acres below the baseline level. The largest subunit in the BMU is 145,847 acres in size. The reduction below baseline in the Madison #2 Subunit would be 0.2% of the acreage of the largest Subunit in the BMU. In the Henry's #2 Subunit, secure habitat would be reduced 2,426 acres below the baseline level if all proposed temporary roads were constructed and used at the same time, a reduction below baseline of 1.9% (relative to theacreage of the largest Subunit in the BMU). The reduction below baseline in the Henry's Lake #2 Subunit would not exceed 1% of the acreage of the largest Subunit in the BMU, as proposed treatment units (and associated temporary roads) that would affect secure (those requiring temporary roads that when buffered would be coincident with existing secure habitat) would either be dropped, or implementation of activities affecting secure below baseline staged or phased. By implementing activities in stages or phases, and obliterating temporary roads in an area before moving on to another, the impact to secure habitat below baseline would not exceed 1% of the largest Subunit in the BMU. Compliance will be ensured through application of project sideboards. The Proposed Action would meet this standard with regard to temporary project roads, as temporary roads affecting secure habitat below baseline would be in use for no more than four years (three years implementation and one additional year to ensure effective decommissioning).

Standard/Guideline	Compliance
FW-GDL-WLGB-01 Temporary Changes in Secure Habitat. To minimize human disturbance and associated displacement of grizzly bears, project activities should meet the following conditions for temporary reductions in secure habitat below baseline inside the recovery zone/primary conservation area: a. Project activities should be concentrated in space and time to minimize disturbance.	Project activities would be implemented in a manner that would minimize disturbance to the greatest extent possible. Activities will occur in portions of the project area while other areas will have no disturbance. Implementation in the active portions of the project area will occur as quickly as possible given constraints (including adherence to sideboards and design features) and temporary project roads decommissioned/obliterated before moving on to another area (to be compliant with Forest Plan direction as well as grizzly-bear specific sideboards and design features).

5.1.7 Summary of Effects of Proposed Action on Grizzly Bear

The Proposed Action would be in compliance with all FP standards related to grizzly bear. The Proposed Action would affect food and seasonal foraging habitat quality. Disturbance associated with implementation would likely displace potential ungulate prey/carrion into areas where disturbance is not occurring. Bears would also likely move to less disturbed areas in response to the sight and sound of implementation and changes in habitat/forage availability. Movements would be temporary, short distance, and at the small scale in relation to the size of the affected Subunits and the scale at which grizzly bears operate across the landscape. Increased understory vegetation production would benefit grizzly bears. Aspen and whitebark pine would be enhanced, which would benefit multiple species, including grizzly bears. The ecological function of riparian areas would be protected through project design features; any activities that occur in riparian areas would maintain the structure and function of the riparian area in the long term. The Proposed Action would result in a temporary reduction in the amount of available denning habitat or denning habitat quality in the affected Subunits. The Proposed Action vegetative treatment activities would also affect grizzly bear secure habitat by causing disturbance during project implementation and temporarily reducing secure habitat and temporarily increasing TMARD. Use of system and temporary project routes may cause individual bears to move to adjacent areas in their home range with less disturbance while implementation and road use are occurring. Temporary reductions in secure habitat would be localized and grizzly bears operate at such large scales that they would be able to adjust their use of the landscape to find areas in their home ranges away from project roads that provide security. In the context of individual Subunits, the expected level of impact would be relatively small in the short term and activities spread over a number of years (within and between Subunits). The Project would also have permanent impacts to secure habitat in the Henry's Lake #2, Plateau #1, and Madison #2 Subunits; there would be a permanent increase in secure habitat in all three Subunits under this project. OMARD would increase in the Henry's Lake #2 Subunit but decrease in the Madison #2 and Plateau #1 Subunit; the full Travel Plan implementation level of OMARD would be met in both Subunits. For the above reasons, and due to the fact that secure habitat would be temporarily reduced below the already degraded secure habitat baseline in the Madison #2 and Henry's Lake #2 Subunits, the Proposed Action may affect, and is likely to adversely affect the grizzly bear. The effects described above do not represent a significant adverse effect on this species because they would largely be temporary, would provide for diverse food resources and forest structure in the long term, and would meet all Forest Plan standards related to grizzly bear and their habitat.

5.2 Canada Lynx

5.2.1 Issue

Canada lynx (referred to herein as lynx) was listed as a threatened species in the contiguous United States under the ESA in 2000. Critical habitat has been designated for the species, but the project is not located within the critical habitat boundary. According to the most current understanding of lynx ecology and behavior, timber harvest has the potential to affect lynx productivity through impacts on foraging habitat (USDA Forest Service 2007a pg. 2; Ruediger et al. 2000).

5.2.2 Resource Indicators and Measures

Because vegetation management projects may affect lynx through impacts on foraging habitat, this factor was selected as the resource indicator for this analysis to compare effects of the alternatives on Canada lynx. Effects on foraging habitat were measured by quantifying how the project would affect lynx foraging habitat (i.e., snowshoe hare winter habitat), which includes stands in the stand initiation and multi-storied structural stages, and whether the project is consistent with FP direction.

Table 19: Resource indicators and measures for assessing effects on Canada lynx.

Issue	Resource Indicator	Measure- No Action	Measure- Proposed Action	Used to address: P/N, or key issue?	Source
Vegetation management may alter lynx foraging habitat.	Effects on lynx habitat in the stand initiation structural stage	• Ongoing fire suppression → decrease over time • Insect/Disease → increase in 15-40 years	*Regeneration Harvest:* • 69 acres treated. • Upto 4,600 acres created in about 15-40 years post-treatment (7,737 acres in stand pool; however, sideboards would reduce this to no more that 4,600 acres). *Non-commercial Thin:* • 304 acres treated. *All harvest:* • 535 acres treated.	No	NRLMD (USDA Forest Service 2007d)
Vegetation management may alter lynx foraging habitat	Effects on lynx habitat in the multi-storied structural stage	• Ongoing fire suppression → increase over time • Insect/Disease → increase in 15-40 years	*Regeneration Harvest*: • 406 acres treated. *Non-commercial Thin:* • 71 acres treated. *All harvest:* • 1,061 acres treated.	No	NRLMD (USDA Forest Service 2007d)

5.2.3 Methodology and Information Sources

5.2.3.1 Spatial and Temporal Context for Effects

In 2000, the Canada Lynx Conservation Assessment and Strategy (LCAS) recommended that Lynx Analysis Units (LAUs) be identified for all areas with lynx habitat "to provide analysis units of the appropriate scale with which to begin the analysis of potential direct and indirect effects of projects or activities on individual lynx, and to monitor habitat changes" (Ruediger et al. 2000). Lynx Analysis Units (LAUs) contain all components of lynx habitat (encompassing all seasons) and approximate the size of an area used by an individual female lynx (ILBT 2013). The LCAS indicates that LAUs should be larger in less contiguous, poorer quality, or naturally fragmented habitat. LAUs serve as the geographic areas to assess potential lynx habitat and project effects, and compliance with the standards, objectives, and guidelines of the NRLMD (USDA 2007a and 2007b). The Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team 2013) and NRLMD Record of Decision (ROD) (USDA Forest Service 2007a, Attachment 1, pg. 12) discuss the use of a lynx analysis unit (LAU) to analyze project impacts to Canada lynx. The South Plateau project lies entirely within the South Madison LAU, which is 39,944 acres in size. The South Madison LAU served as the spatial extent for the analysis of effects on the lynx. Figure 1 displays the analysis area for Canada lynx. This LAU is the appropriate effects action area for lynx because it is of a sufficient size to consider how the effects from the project could, when considered with other actions within the LAU, affect the species. It also contains all of the proposed units that fall within mapped lynx habitat.

The temporal context for the analysis would be from project implementation to approximately 40 years in the future. It would take approximately 40 years for stands experiencing intermediate thinning to enter a multistory habitat structure; regeneration harvest stands would require a minimum of 15 years to enter a structural stage that would support snowshoe hare foraging during the winter.

5.2.3.2 Methods Used for Analysis

Throughout the lynx analysis, multiple terms will be used in reference to lynx habitat. The following definitions are intended to clarify the terms:

"Lynx Habitat" is used as defined in the NRLMD (USDA Forest Service 2007a) in that it refers to mesic coniferous forest that experiences cold, snowy winters and provides a prey base of snowshoe hare. Lynx habitat generally occurs between 3,500 and 8,000 feet of elevation, and primarily consists of lodgepole pine, subalpine fir, and Engelmann spruce.

Types of lynx habitat (e.g., stand initiation, mature multi-story, etc.) are used as defined in the NRLMD ROD and were identified in the project area using the methods described below. "Stand initiation" habitat is defined in USDA Forest Service (2007a), pg. 14, as a stage that "generally develops after a stand-replacing disturbance by fire or regeneration timber harvest. A new single-story layer of shrubs, tree seedlings, and saplings establish and develop, reoccupying the site. Trees that need full sun are likely to dominate these even-aged stands."

The NRLMD ROD states that "multi-story mature" is similar to the "old multistory structural" stage. However, trees are generally not as old, and decaying trees may be somewhat less abundant (USDA Forest Service 2007a, pg. 13). The "old multistory structural stage" is defined as consisting of "Many age classes and vegetation layers mark the old forest, multistoried stage. It usually contains large old trees. Decaying fallen trees may be present that leave a discontinuous overstory canopy. On cold or moist sites

without frequent fires or other disturbance, multi-layer stands with large trees in the uppermost layer develop" (USDA Forest Service 2007a, pg. 13).

For this analysis, the amount of potential lynx habitat and existing snowshoe hare winter habitat (lynx foraging habitat) within the South Madison LAU was identified. Potential lynx habitat includes all areas that are capable of providing habitat for lynx, regardless of their current condition. Snowshoe hare winter habitat includes mature multi-storied stands and stands in the stand initiation structural stages that have regenerated between 15 and 40 years. Habitat was identified in a two-stage process: 1) GIS analysis followed by 2) field verification of the GIS data.

Over time, the methodology for delineating lynx habitat has changed as Regionally-developed and supported data layers, updated GIS analysis techniques, and guidance from recently published literature and lynx researchers has become available. As part of updating potential lynx habitat mapping, methodologies were developed to categorize potential lynx habitat into the forest structural stages commensurate with those in the Northern Rockies Lynx Management Direction (NRLMD). An updated existing vegetation layer (2015 R1VMAP) became available recently and is based on recent satellite imagery. The accuracy assessment for this layer indicates that it is very robust in classifying lifeform (tree versus grass), vegetation size class, canopy cover, and dominance type. One advancement of the VMAP used for the 2016 analysis is that the newer version picks up recent disturbance in previously forested habitats. In addition, previous queries of existing vegetation and ecological data that eliminated southerly aspects as potential lynx habitat were eliminated. Documentation of this 2016 lynx habitat mapping refinement effort for the Custer Gallatin National Forest (CGNF) is provided in Canfield (2016). The methodology and binning logic described in Canfield (2016) for identification of lynx habitat is consistent with the Regional Forester's memo dated September 6, 2016 regarding lynx habitat mapping in Region 1 (Marten 2016).

The first step in classifying lynx habitat involves using vegetation and physical parameters to identify potential habitat. Potential lynx habitat now includes all spruce and subalpine fir habitat types (where spruce and subalpine fir are the climax vegetation type), regardless of their existing cover type (largely comprised of lodgepole pine) and moist Douglas fir habitat types where it occurs within 200 meters of primary habitat, between 6,000-8,800 feet elevation (Canfield 2016). The second step of the lynx habitat classification process was to identify stands within the potential lynx habitat layer that currently provide snowshoe hare winter habitat. This process consisted of identifying stands that are either currently in the stand-initiation structural stage that provides suitable horizontal cover or that are in the multi-storied structural stage. Stands that are in the early stand-initiation structural stage that do not yet provide suitable horizontal cover were also identified. The process of parceling stands out into these structural stages was based on history of disturbance or current vegetation condition within stands. Current vegetation condition was determined using 2015 R1VMap.

It was assumed in the classification process that regenerating stands in potential lynx habitat take at least 15 years to provide enough horizontal cover to support snowshoe hares in the winter. It was also assumed that stands that have regenerated longer than 40 years have entered the stem exclusion stage and no longer provide enough horizontal cover to support snowshoe hares in the winter.

What impact will snowmobiles have on this habitat?

Based on that assumption, to identify stands within potential lynx habitat that are currently in the stand initiation structural stage that does not yet provide snowshoe hare winter habitat (herein referred to as "early stand initiation"), the GNF FACTS database (the Forest's record of forest management actions) was used to query stands that were treated with regeneration harvest activities that occurred within the last 15 years (after the year 2000). The Region 1 MTBS fire history layer was also used to identify stands that burned at a severe intensity within the last 15 years. Current vegetation condition within areas identified as potential lynx habitat was also used to identify areas that are in the early stand initiation structural

stage. This included areas that are sparsely vegetated or dominated by grass or shrubs. It also included areas where average tree size is 0-5″ DBH and tree canopy cover is less than 60%.

To identify stands within potential lynx habitat that are currently in the stand initiation structural stage that does provide snowshoe hare winter habitat (herein referred to as “stand initiation”), the GNF FACTS database was used to query stands that were treated with regeneration harvest activities that occurred between 15 and 40 years ago (between 1975 and 2000). The Region 1 MTBS fire history layer was also used to identify stands that burned at a severe intensity between 15 and 40 years ago. Current vegetation condition within areas identified as potential lynx habitat was also used to identify areas that are in the stand initiation structural stage. This included areas where tree size is 0-5″ DBH and tree canopy cover is at least 60%.

To identify multi-storied stands that currently provide snowshoe hare winter habitat, the binning logic included stands where trees are greater than 10″ DBH in size and tree canopy cover is at least 40%. An exception was made for stands dominated by lodgepole pine with a canopy cover of at least 60%. These stands were assumed to be in the stem exclusion stage and were not considered to provide enough horizontal cover to support snowshoe hares in the winter.

After selection and binning of stands was completed, field verification was performed to verify the results. Coverboard analyses were conducted throughout the project area in the summer of 2019, according to the protocol outlined in Bertram and Claar (2009). Coverboard survey points were randomly assigned to mapped multistory habitat in the LAU. The threshold value referenced in Bertram and Claar (2009) is 48%. Approximately 80% of the mapped multistory stands had sufficient horizontal cover to provide snowshoe hare forage. The model tended to over-estimate multi-storied habitat in the project area, i.e., it identified areas as multi-storied when they don’t actually provide sufficient cover to support snowshoe hare in the winter. This is acceptable, as effects on lynx foraging habitat were, therefore, likely to be over-estimated.

5.2.4 Affected Environment

5.2.4.1 Regulatory Framework

The USFWS listed Canada lynx as a threatened species in March 2000. USFWS determined that the main threat to lynx was the “lack of guidance for conservation of lynx and snowshoe hare habitat in National Forest Land and Resource Plans and BLM Land Use Plans (USDI Fish and Wildlife Service 2000 pg. 8).

In 2007, the Forest Service completed the Northern Rockies Lynx Management Direction Final Environmental Impact Statement (FEIS) (USDA Forest Service 2007b). The NRLMD incorporated conservation measures from the Lynx Conservation Assessment and Strategy (Reudiger et al. 2000, updated in 2013). In March of 2007 the FS issued the NRLMD ROD (USDA Forest Service 2007a). The ROD was amended to forest plans in the Northern Rockies, including the Gallatin Forest Plan.The NRLMD ROD (USDA Forest Service 2007a) amended the forests plans of 18 National Forests within the Rocky Mountain, Intermountain, and Northern Regions of the Forest Service, including the Gallatin National Forest, establishishing management direction (objectives, standards, and guidelines) to conserve and promote recovery of the Canada lynx, by reducing or eliminating adverse effects from land management activities on NFS lands, while preserving the overall multiple use direction in existing plans. The 2022 Custer Gallatin Forest Plan also incorporates the NRLMD management direction as a standard (Standard FW-STD-WLLX-01, Appendix G). The decision states that "the management direction only

applies to occupied lynx habitat." (USDA Forest Service 2007a, page 29). The NRLMD is considered the best available information on lynx habitat management.

No science since then?

The NRLMD provides standards and guidelines to apply to lynx habitat. Although developed in 2007, the NRLMD is consistent with more recent science that has been published regarding lynx habitat and populations. A review of recent information and science concluded that the NRLMD is consistent with recent information, and, thus, is applicable as a management strategy (USDA Forest Service 2013a).

"recent" review is 9 years old??

In the NRLMD, objectives define desired resource conditions for lynx habitat (USDA Forest Service 2007a). Standards are non-discretionary management requirements used to meet objectives. Guidelines are management actions normally taken to meet objectives. The objectives, standards, and guidelines of the NRLMD were incorporated into the design of the vegetation treatments proposed in the South Plateau Project. Those that apply to this project are discussed here.

In March 2017, the US Fish and Wildlife Service provided an amended Incidental Take Statement for the NRLMD, as the 10-year life of the original ITS was coming to an end (USDI 2017b). The amended ITS contains updated limits to the number of acres of lynx habitat that may be treated on the Gallatin National Forest under the WUI exemption to Standards VEG S1, S2, S5, and S6 for the five year period from 2017-2022. The amended ITS also provides limits to the number of acres on the Gallatin that can be treated under the exceptions to Veg S5 for precommercial thinning for other resource benefit from 2017-2022. The Record of Decision for the Custer Gallatin Forest Plan (USDA 2022) was signed in January 2022. The Biological Assessment and Biological Opinion for the Forest Plan provided updated limits to the acreage that may be treated under the WUI exemption (applying to fuels treatment projects only) and for precommercial thinning for other resource benefit for the entire Custer Gallatin National Forest for the life of the new plan. The limits provided in the 2020 BA and 2022 BO (USDA 2020 and USDI 2022) will be used for this project and subsequent projects. Snowshoe hare habitat quality may be temporarily degraded on up to 46,865 acres of snowshoe hare habitat using exemptions for WUI treatments and 2,260 acres for exceptions for other resource benefit. In total, the Forest may treat up to 49,125 acres of snowshoe hare habitat within occupied lynx habitat (temporarily decreasing the existing dense horizontal structure) over the life of the Plan.

What did SJJ say about the plan and lynx?

5.2.4.1.1 Vegetation Management

To provide for lynx needs, the NRLMD established standards and guidelines to meet objectives for winter snowshoe hare habitat, which is a limiting factor for lynx persistence (USDA Forest Service 2007a). The objectives for vegetation management (excluding the use of prescribed fire) in lynx habitat are:

- Objective VEG O1: Manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.
- Objective VEG O2: Provide a mosaic of habitat conditions through time that support dense horizontal cover, and high densities of snowshoe hare. Provide winter snowshoe hare habitat in both the stand initiation structural stage and in mature, multi-story conifer vegetation.
- Objective VEG O4: Focus vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover.

Four standards and five guidelines were included in the NRLMD to ensure that forest vegetation management practices led to accomplishment of those objectives.

Two of the standards (VEG S1 and VEG S2) address the *quantity* of winter snowshoe hare habitat and its rate of change on the landscape. The 30% per LAU limit on stand initiation phase habitat (from VEG S1) and the 15% change per decade limit on regeneration timber harvest (from VEG S2) serve as cumulative effects thresholds. As stated in the NRLMD (USDA Forest Service 2007a pg. 9), stand-replacing wildfire, high intensity prescribed burning, and regeneration timber harvest are the mechanisms by which the quantity of lynx habitat may be affected by rendering it temporarily unsuitable.

Two additional standards (VEG S5 and VEG S6) address the *quality* of winter snowshoe hare habitat. VEG S5 limits precommercial thinning in winter snowshoe hare habitat in the early stand initiation and stand initiation stages, while standard VEG S6 limits all vegetation management activities that reduce winter snowshoe hare habitat in multi-story forests.

All four of the vegetation standards listed above have an exemption for fuel treatment projects in the wildland urban interface (WUI). The NRLMD (USDA Forest Service 2007a) states that fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). The NRLMD defines fuel treatment as a type of vegetation management action that reduces the threat of ignition, fire intensity, or rate of spread, or is used to restore fire-adapted ecosystems (USDA Forest Service 2007a pg. 11). The NRLMD ROD defines the WUI as the area adjacent to an at-risk community that is identified in a community wildfire protection plan (USDA Forest Service 2007a pg. 15). The WUI identified in the Gallatin County Community Wildfire Protection Plan (Gallatin County 2007) meets this definition. The Gallatin County CWPP is currently being updated. As part of this update, the WUI boundary is being refined. As a result, there is less WUI in the South Plateau area than was present in the 2007 CWPP. For this analysis, the new, refined (representing fewer acres of WUI) WUI boundary will be used for analysis purposes. As shown in Figure 11, proposed treatment activities lie both within and outside the refined WUI boundary. All treatment activities within the WUI would be consistent with NRLMD standards or would be consistent with the WUI exemption to the NRLMD standards. All activities outside the WUI boundary would be consistent with the NRLMD standards.

Currently? Or has been completed? See https://www.readygallatin.com/wpfb-file/gallatin-hazard-mitigation-and-community-wildfire-protection-plan-nov-2020_redacted-pdf/

Guideline VEG G1 provides the basis for project design so as to enhance habitat conditions for lynx or their prey. Guideline VEG G4 provides design criteria for prescribed fire activities. Guideline VEG G5 addresses consideration of habitat for alternate prey species. Guideline VEG G11 provides guidance for denning habitat. Finally, Guideline VEG G10 ensures that, in cases where the WUI exemption is used, projects will be designed with the consideration of Standards VEG S1, S2, S5, and S6.

In the process of this analysis, the Kosterman Master's Thesis (Kosterman 2014) concerning lynx habitat relationships was considered. The Northern Region's letter of April 20, 2016 (Marten 2016b) summarizes recommendations in the Kosterman thesis relative to standards and guidelines in the NRLMD. Metrics used in the thesis to describe and assess forest structural relationships within home ranges of female lynx in NW Montana are not comparable to forest structural metrics used to develop management direction provided in the NRLMD. The young regenerating and mature forest classes described in the Kosterman Thesis do not correlate with young regenerating and mature forest classes defined in the NRLMD. The NRLMD provides a maximum threshold of young regenerating forests that do not provide winter habitat for snowshoe hare (Standards VEG S1 and S2), and restricts management actions that reduce snowshoe hare habitat in mature, multistoried forests (Standard VEG S6). In contrast, the Kosterman thesis defines young regenerating and mature forest classes using broad vegetation characteristics which may or may not encompass snowshoe hare habitat. It is therefore unclear how Kosterman's recommendations relate to NRLMD standards. Therefore, until it can be determined how Kosterman's defined structural classes relate to the structural stages and standards described in the NRLMD use of the thesis in project level analysis would be premature. Further, the Kosterman thesis was based on a study done in northwest

refuting Kosterman 2014

Montana and may not be relevant to the Greater Yellowstone Ecosystem. For these reasons the Kosterman thesis was not used to inform our analysis or conclusions.

In addition, recent publications were reviewed to assess their applicability to the South Plateau Project. Kosterman and others (2018) found that in northwest Montana, the highest quality core area for female lynx is provided within a habitat mosaic that includes mature forest in a connected configuration and intermediate amounts of small-diameter regenerating forest. Importantly, the amount of small-diameter regenerating forests that is optimal for female lynx is greater where mature forest becomes is more connected. This research was done in occupied lynx habitat in northwest Montana where breeding females are present. The proposed activities would provide for a mosaic of lynx habitat that would allow for the movement of transient lynx, should they pass through the area.

Responding to Kosterman 2018

Holbrook and others (2018) examined how lynx responded to different vegetation treatments in northwestern Montana. The authors found that Canada lynx used treated areas. Immediately following treatment and for approximately 10 years in the future, lynx use in treated stands was low. Lynx used thinning treatments faster (approximately 20 years) that more intense silvicultural treatments (e.g. regeneration harvest and selection cuts), which took 34-40 years. It was also found that the forest structure in the vicinity of the treatment area affected lynx occupancy and intensity of use. This demonstrated that both the recovery time as well as the spatial context of a particular area are important considerations when implementing different silvicultural treatments for Canada lynx at the landscape scale. The timeframes associated with recovery of snowshoe hare foraging habitat are consistent with those used in the effects analysis for this project.

No use in treated areas for 20-40 years.

In northwestern Montana, Holbrook and others (2017a) found that lynx use mature stands in proportion to their availability and that mature spruce-fir forests are used more than any other structure stage or species. The value of the mature forest component as foraging habitat for lynx (within occupied home ranges in this study) is likely highly variable and dependent on existing horizontal cover values at the local scale. Within their home ranges, female and male lynx increasingly used advanced regeneration forest structures as they became more available (up to a maximum availability of 40%). Advanced regeneration was found to provide the greatest snowshoe hare abundance, while mature forest is where lynx appear to hunt most efficiently. Intermediate snow depths and the distribution of snowshoe hares were the strongest predictors of where lynx selected their home ranges. Lynx were also found to exhibit decreasing use of stand initiation structures (up to a maximum availability of 25%). The definition of stand initiation structure used in this publication includes very young stands with very few trees and open canopies resulting from recent disturbances. SI structures as defined in this paper and the SI structural stage defined in the NRLMD are not comparable; stands in the SI structural stage as defined in the NRLMD (and that apply to standard VEG S1) approach 20-25 years of age before moving to advanced regen structures that provide snowshoe hare habitat during winter. The stand initiation structure defined by this publication is therefore a subset of the SI structural conditions used in NRLMD standard VEG S1 to establish the 30% SI condition threshold. Holbrook and others (2017b) examined habitat relationships of snowshoe hare in a mixed conifer landscape in northwestern Montana. The authors found that occupancy and intensity of use by snowshoe hares were positively related to horizontal cover. This study also indicated that dense horizontal cover within multistoried forests with a substantial component of medium-sized trees (i.e., 12.7–25.4 cm) produced the highest use by snowshoe hares and that lodgepole pine and spruce-fir are indicators of snowshoe hare habitat in the northern Rockies. This study also found that disturbance (vegetative treatment or burning) in multistoried stands with high horizontal cover may have negative short term impacts on snowshoe hare, but would ultimately benefit hares and hare habitat in the future (20-50 years) by allowing for development of horizontal cover.

5.2.4.1.2 Connectivity

One Standard and one Guideline address habitat connectivity for lynx. Standard ALL S1 addresses habitat connectivity in that "new or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area." As stated in the NRLMD, maintaining habitat connectivity means providing enough vegetation cover arranged in a way that allows lynx to move around (USDA Forest Service 2007a pg. 11, definition of "connectivity"). Individual lynx maintain large home ranges, varying from about 15,000 to 30,000 acres (10-20 mi^2) (USDA Forest Service 2007b pg. 141). Lynx are highly mobile and have the propensity to disperse long distances. Genetic work has shown that lynx throughout North America are closely related (Schwartz et al. 2002), indicating populations have been well enough connected to maintain close kinship. Narrow forested mountain ridges or shrub-steppe plateaus may serve as a link between more extensive areas of lynx habitat, and wooded riparian areas may provide travel cover across open valley floors (USDA Forest Service 2007b, pg. 142). While lynx tend to move through cover, they are also known to occur in non-forested areas, such as shrub-steppe habitats (Ruggiero et al. 2000 pg. 379), and, as such, openings such as those created by timber harvest are not considered barriers to lynx movement. No natural or human-caused barriers that prohibit movement of lynx have been identified (USDA Forest Service 2007b pg. 181). There is no evidence that lynx avoid or are displaced by unpaved roads and, therefore, no evidence that forest roads negatively impact lynx (USDI Fish and Wildlife Service 2003 pg. 40097).

Maintaining habitat connectivity does not require keeping the status quo. Habitat connectivity can be maintained as long as there is enough cover for lynx to move through an area. The juxtaposition of existing development and vegetation structure must be considered to evaluate compliance with this standard. Management direction found in the land management plans to retain riparian cover provides for lynx movement between and within vegetation management units, and few vegetation projects affect habitat connectivity (USDA Forest Service 2007b pg. 31).

Guideline HU G9 addresses design criteria for project roads. It directs that "on new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over these roads should be reclaimed or decommissioned, if not needed for other management objectives."

5.2.4.1.3 Summary of Regulatory Framework

In summary, the following standards and guidelines set the regulatory framework for management of lynx habitat (excluding the use of prescribed fire) when considering the design and effects of a vegetation management project.

Table 20: Regulatory Framework for vegetation management projects in lynx habitat applicable to this project.

Label	Direction
Standard ALL S1	New or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.
Standard VEG S1	With some exemptions (fuels treatment in WUI), if more than 30% of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects.
Standard VEG S2	With some exemptions (fuels treatment in WUI), timber management projects shall not regenerate more than 15% of lynx habitat on National Forest System lands within an LAU in a 10-year period.

Label	Direction
Standard VEG S5	Precommercial thinning projects that reduce snowshoe hare habitat may occur from the stand initiation structural stage until the stands no longer provide winter snowshoe hare habitat only: (1) within 200' of administrative sites, dwellings, or outbuildings; (2) for research studies or genetic tree tests evaluating genetically improved reforestation stock; (3) based on new information…where a written determination states that a project is not likely to adversely affect lynx, or that a project is likely to have short term adverse effects on lynx or its habitat but would result in long-term benefits to lynx and its habitat; (4) for conifer removal in aspen, or daylight thinning around individual aspen trees where aspen is in decline; (5) for daylight thinning of planted rust-resistant white pine where 80% of the winter snowshoe hare habitat is retained; or (6) to restore whitebark pine. For the Custer Gallatin National Forest, up to 2,260 acres of precommercial thinning that reduces snowshoe hare habitat may be treated for other resource benefits under the exception criteria to Veg S5 (Custer Gallatin Forest Plan – USDA 2022)). Fuels treatment projects within the WUI that do not meet these Standards shall occur on no more than 46,865 acres (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest, in this case the entire Custer Gallatin National Forest) (Custer Gallatin Forest Plan – USDA 2022).
Standard VEG S6	Vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late-successional forests may occur only: (1) within 200' of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; (2) for research studies or genetic tree tests evaluating genetically improved reforestation stock; or (3) for incidental removal during salvage harvest (e.g., removal due to location of skid trails). Fuels treatment projects within the WUI that do not meet these Standards shall occur on no more than 46,865 acres (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest, in this case the entire Custer Gallatin National Forest) (Custer Gallatin Forest Plan – USDA 2022).
Guideline VEG G1	Vegetation management projects should be planned to recruit a high density of conifers, hardwoods, or shrubs, where such habitat is scarce or not available. Priority for treatment should be given to stem-exclusion, closed-canopy structural stands to enhance habitat conditions for lynx (e.g. mesic, monotypic lodgepole stands).
Guideline VEG G4	Prescribed fire activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.
Guideline VEG G5	Habitat for alternative prey species, primarily red squirrel, should be provided in each LAU.
Guideline VEG G10	Fuel treatment projects within the WUI as defined by the Healthy Forests Restoration Act should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation.
Guideline VEG G11	Denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris. If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris piles or residual trees to provide denning habitat in the future.
Guideline HU G9	On new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives.

How much here?

5.2.4.2 Existing Condition

The Canada lynx is considered by the Fish and Wildlife Service to be present on the District (USDA Forest Service and USDI Fish and Wildlife Service 2006, and USDI Fish and Wildlife Service 2021). The Hebgen Lake Ranger District records (NRM Wildlife 2021) contain one observation of a Canada lynx from 1977 within the project area; another observation occurred approximately 11 miles north of the project area in the vicinity of Teepee Creek. The Montana Natural Heritage Program maintains a species observation database that can be queried by species, location, and other variables (MTNHP 2021). A query of the database indicated there are four records of lynx observations within 20 miles of the project area between 1977 and 1993. No records of observations are present in the database after 1995. These observations are categorized as verified or anecdotal. Verified observations or records are those that scientifically document a lynx by identifying physical remains, live-captured animals, or DNA samples. Anecdotal observations are generally tracks and reported sightings where physical evidence is lacking. Two of the records were from furbearer harvest data and two were anecdotal observations. In addition to the above information sources, several collared lynx captured in Canada and transplanted to Colorado were radio-located in Montana (Devineau et al. 2010). Eight of Colorado's 218 reintroduced lynx made 10 forays into Montana, lasting from 1 to 217 days (Ivan 2012). One of the individuals passed north out of the Park in 2006, lingered in the Madison Range (approximately 22 miles from the project area) for a time, then passed back into Yellowstone National Park near the west entrance and was lost.

Lynx productivity is dependent on the quantity and quality of winter snowshoe hare habitat (USDA Forest Service 2007a pg. 11; USDA Forest Service 2007b pg. 153). Winter snowshoe hare habitat consists of young regenerating spruce/fir forests, where the trees protrude above the snowline, and in multi-story spruce/fir forests where limbs of the overstory touch the snowline, in addition to shorter understory trees that provide horizontal cover. According to USDI Fish and Wildlife Service (2000), two important human influences on snowshoe hare habitat are timber harvest and fire suppression, because these two influences can alter the abundance and distribution of winter snowshoe hare habitat.

Lodgepole does not provide winter hare habitat?

Timber harvest, including fuel reduction efforts, can affect the amount and distribution of these habitat elements, and this can, in turn, affect lynx productivity (USDA Forest Service 2007a pg. 8). Timber harvest has the potential to be beneficial, benign, or detrimental depending on the harvest method, the spatial and temporal occurrence on the landscape and the inherent vegetation potential of the site (USDI 2003, USDA Forest Service 2007b).

Fire suppression in the past half century has likely had little impact on lynx at the population scale, because most forests where lynx occur have natural fire return intervals that are longer than the period of time of human fire suppression or because fires that do occur in lynx habitat are large, high in intensity, and difficult to suppress (USDI Fish and Wildlife Service 2003 pg. 40094). Fire suppression can affect lynx at the local scale, because it can reduce the quality of habitat by reducing the amount of younger forests or by changing the species composition and structure of forests (USDI Fish and Wildlife Service 2003 pg. 40094).

For this analysis, the amount of potential lynx habitat and existing snowshoe hare winter habitat within the South Madison LAU was identified as described under the methodology section above. Potential lynx habitat includes all areas that are capable of providing habitat for lynx, regardless of their current condition. Snowshoe hare winter habitat includes mature multi-storied stands and stands in the stand initiation structural stage that have regenerated between 15 and 40 years.

The South Fork Madison LAU covers an area of about 39,944 acres in the southern portion of the Henry's Lake Mountains. It extends south from West Yellowstone and State Highway 20 to the Continental Divide and the Yellowstone National Park Boundary to the east. While little timber harvest has occurred

Widespread harvest before 2001

in the LAU in recent years, widespread harvest occurred prior to approximately 2001. Past activities, actions, and events have affected lynx habitat in the LAU; these activities, actions, and events have been incorporated into the existing condition of lynx habitat provided in this analysis.

The structural stage binning logic (Canfield 2016) applied to the analysis area identified approximately 31,587 acres within the LAU that meet the criteria for potential lynx habitat. The remainder of the LAU that does not provide lynx habitat consists of dry forest types and large open areas of meadow, rock or water, including alpine habitat above tree line. Approximately 31,309 acres of the total lynx habitat in the LAU is situated on NFS lands. Of the existing lynx habitat in the LAU, 3,764 acres (11.9%) is young, densely stocked conifer regeneration foraging habitat (Stand Initiation). Foraging habitat is available in the understory of mature, multistory stands as well. Multistory stands occur on approximately 4,084 acres (12.9%) in the LAU. Roughly 482 acres (1.5%) of the lynx habitat within this LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat. The LAU is currently well below the 30% maximum for Early Stand Initiation structure habitat (Standard VEG S1). In the last ten years there has been approximately 14 acres of regeneration harvest in the South Fork Madison LAU, so the LAU is also consistent with NRLMD Standard VEG S2. The rest of the lynx habitat in the LAU (23,257 acres or 73.6%) is in the Other structural stage, and does not currently have sufficient horizontal cover to support snowshoe hare foraging. These stands may provide denning opportunities, but otherwise provide security cover for travel or resting purposes. Table 21 below shows the existing condition of lynx habitat in the South Fork Madison LAU. Existing mapped lynx habitat in the South Fork Madison LAU is displayed in Figure 12.

By adding the amount of Stand Initiation, Early Stand Initiation, and Multistory habitat, it can be concluded that the LAU contains 8,330 acres (3,764 + 482 + 4,084) of lynx habitat that currently provides habitat for snowshoe hare. Denning habitat was also quantified for this analysis. The habitat that qualified as denning habitat included the Multistory mature and more open and mature stem exclusion structural stages (a component of the Other structural stage). The LAU currently contains up to 24,932 acres (4,084 Multistory + 20,848 Stem Exclusion) of lynx habitat that may have the structure and understory complexity (high downed wood densities) to support lynx denning.

Table 21: Existing Condition of Lynx Habitat within the South Madison LAU

LAU Name	LAU Total Acres	Total Lynx Habitat Acres	Stand Initiation[1] (provides winter forage) Acres (% of lynx habitat)	Early Stand Initiation[2] (provides summer forage only) Acres (% of lynx habitat)	Multistory[3] Acres (% of lynx habitat)	Other[4] (Does not provide forage e.g. stem exclusion) Acres (% of lynx habitat)
South Madison	39,943	31,587	3,764 (11.9%)	482 (1.5%)	4,084 (12.9%)	23,257 (73.6%)

[1]Stand 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.

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

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

[4]Other –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.

Linkage areas are identified where factors placing habitat connectivity at risk, such as highways or private land developments, are currently separating large contiguous blocks of lynx habitat. A linkage area is present in the project area and LAU in the vicinity of Targhee Pass. This north-south linkage area emphasizes the importance of maintaining habitat to facilitate movement across US Highway 20 in the vicinity of Targhee Pass.

5.2.5 Environmental Consequences

5.2.5.1 Direct and Indirect Effects

5.2.5.1.1 Alternative 1 – No Action

Natural disturbances and forest succession within the LAU would affect the amount and quality of lynx foraging habitat over time. These changes are difficult to predict; both disturbance and transition to late successional stages can increase lynx foraging opportunities over time. Ongoing fire suppression in the LAU would cause stand initiation habitat to be less available over time, reducing the mosaic of habitats across the landscape. More multi-storied habitat could eventually be available across the LAU under this scenario as stands in the "Other" structural stage that do not currently provide snowshoes foraging habitat mature. Ongoing susceptibility and mortality of trees to insect and disease outbreak in the project area would also eventually lead to stand initiation habitat within about 15 to 40 years where stands regenerate as a result. This could also increase diversity and increase multi-storied habitat if a portion of the canopy survived the outbreak but enough regrowth also occurred as to add complexity to forested stands. Large scale, stand-replacing wildfire would reduce the availability of multistory and mid seral (generally stem exclusion or "other" structure) stands over a large area. Although stand initiation structure snowshoe hare habitat would develop, there would be a lack of older structure stands providing winter snowshoe habitat.

Large scale stand replacing fire would harm hare habitat

5.2.5.1.2 Proposed Action

In the following analysis of effects for the Proposed Action, several assumptions are made with regard to impacts to lynx habitat. These assumptions were made for a number of reasons, including the fact that project sideboards (related to wildlife, fisheries, hydrology, and other resources), design features, and other factors will ultimately determine where activities occur and the extent (i.e. number of acres) of these activities on the landscape. Treatment of multistory stands in the South Madison LAU would be limited in order to retain multistory structure stands to the greatest degree possible given fire/fuels concerns in the vicinity of West Yellowstone and the surrounding residential developments. Generally, only multistory habitat that is within the WUI, within ½ mile of a value at risk (VAR), and is a fuels concern may be treated. Several areas that contain multistory stands outside of ½ mile of VAR have been identified by the fuels specialist due to their strategic importance. These areas generally occur where there is topographic alignment with prevailing winds and topography, where there are limited opportunities elsewhere to break up continuous fuels that lead to VAR, or there is concern over egress. These include areas along the 1720 Road (ATV trail), 1703 Road, 1723 Road, and 1704 Road, which have mapped multistory structure stands adjacent. In all cases, alternative treatments options (treatment of adjacent stands, adjustment of prescriptions, etc.) would be considered to reduce impacts to multistory structure stands within the fuels concern area. For the purposes of analysis, all multistory stands within the fuels concern area (within 1/2 mile of VAR and specific areas described above) that lie within the current stand pool/unit layer would be assumed to be treated and converted to an "Other" or Early Stand Initiation structure/lynx habitat condition. In order to provide a reasonable estimate of affected multistory habitat inside the fuels concern area, it will be assumed for the purposes of analysis that up to 20% of the mapped "Other" structure stands in the fuels treatment area that lie within the current stand pool supports adequate horizontal cover

for snowshoe hare foraging. Multistory lynx habitat outside the fuels concern area (within 1/2 mile of VAR and specific areas described above) would not be treated, despite the fact that the current stand pool overlaps these stands. Cover board surveys would be completed in all mapped multistory and "Other" stands that have 30% or greater understory cover, based on an ocular estimate. Cover board measurements would follow the methodology described in Bertram and Claar (2009). Measuring horizontal cover in these stands would ensure that no multistory habitat (including multistory that may currently be misclassified as "Other" habitat) outside the fuels concern area would be treated. A similar situation exists for areas outside the Gallatin County CWPP WUI (updated); treatment in multistory, stand initiation, and early stand initiation structural stages (based on examination of stands, and, where applicable, lynx cover boards have been used to measure horizontal cover) would not occur outside the WUI.

It was assumed that all treatment activities in Early Stand Initiation (ESI) structure stands would maintain these stands in an ESI condition. It was also assumed that all treatment activities in Stand Initiation (SI) structure stands would convert these stands to an ESI condition. It was also assumed that broadcast burning and clearcut (regeneration harvest) in "Other" stands (those not currently providing snowshoe hare foraging habitat) would convert these stands to an ESI structure; all other treatment types (thin, Douglas-fir thin, fuels, non-commercial thinning, and aspen restoration thinning) would maintain these stands in the "Other" structural stage. It was also assumed that broadcast burning and clearcut (regeneration harvest) in Multistory stands would convert these stands to an ESI structure; all other treatment types (thin, Douglas-fir thin, fuels, non-commercial thinning, and aspen restoration thinning) would convert Multistory structure stands to an "Other" structural stage. These assumptions provide for a conservative assessment of project impacts, as the degree of impact and acres of affected lynx habitat described in this analysis are likely greater than would actually occur under the project (i.e. they area overestimated rather than underestimated).

All of the proposed treatment types, in the long-term, would be expected to provide suitable habitat for snowshoe hare. It would require at least 40 years for intermediate harvested stands converted to the "other" structural stage to develop multi-story habitat structure.

And in the meantime?

Table 22 summarizes the amount of lynx habitat that would be treated under the Proposed Action.

For the following discussion about effects of the Proposed Action on lynx foraging habitat, refer to Table 22. Regeneration harvest would be expected to change the structural stage of a stand from its existing condition to an early stand initiation stage. These stands would provide winter snowshoe hare habitat from about 15 to 40 years post-treatment.

Table 22: Lynx Habitat in the South Madison LAU that would be treated under the Proposed Action.

LAU Name	LAU Total Acres	Total Lynx Habitat Acres	Stand Initiation[1] (provides winter forage) Acres (% of lynx habitat)	Early Stand Initiation[2] (provides summer forage only) Acres (% of lynx habitat)	Multistory[3] Acres (% of lynx habitat)	Other[4] (Does not provide forage e.g. stem exclusion) Acres (% of lynx habitat)
South Madison	39,943	31,587	529 (14.1%)	6 (1.2%)	1,061 (26.0%)	12,976 (55.8%)

[1]Represents stand initiation acres that would be affected for fuels treatment purposes in the WUI, based on the refined CWPP WUI (draft). No SI acres would be affected outside the CWPP WUI in order to meet NRLMD Standards

[2]Represents early stand initiation acres that would be affected for fuels treatment purposes in the WUI, based on the refined CWPP WUI (draft). No ESI acres would be affected outside the CWPP WUI in order to meet NRLMD Standards

[3]Represents the sum of 373 acres of mapped multistory in the fuels concern area and a portion of the "Other" structure in the fuels concern area (373 + 0.20*3,439 acres). This represents the maximum number of acres of multistory structure that would be affected by fuels treatment activities (therefore subject to the WUI exemption to NRLMD standards) in the LAU. No multistory would be affected outside the fuels concern area and all affected multistory would be situated in the WUI.

[4]Represents the sum of 10,225 acres of "Other" structure affected outside the fuels concern area (13,664 – 3,439) and 80% of the affected "Other" structure in the fuels concern area (10,225 + .80*3,439 acres).

A total of 14,572 acres of lynx habitat would be affected based solely on an intersection of the current stand pool with the mapped lynx habitat in the LAU. The current stand pool is overlaid with the existing lynx habitat in the LAU in Figure 13. The acres of affected lynx habitat in Table 22 represent the maximum number of acres of snowshoe foraging habitat that would be affected under the proposed action. These totals are also expected to decrease during implementation due to the fact that sideboards (e.g. limits on acres of regeneration harvest in lynx habitat under NRLMD, limits due to grizzly bear secure habitat standards, etc.), design features (40 acres maximum size of regeneration harvest, at least 500 feet between regeneration harvest units, etc.), and other requirements/realities (e.g. accessibility/feasibility) will further reduce the actual number of treatment acres that occur on the landscape. For example, there are currently 8,787 acres of clearcut proposed in the LAU. In order to meet Standard VEG S2, no more than 15% of lynx habitat on NFS lands in the LAU may be regenerated over a 10 year period. To satisfy this Standard, a maximum of 4,600 acres of regeneration harvest would be allowed in lynx habitat in the LAU. An additional 951 acres of clearcut harvest are situated in the project area outside of mapped lynx habitat (i.e. in non-lynx habitat), which results in a maximum of 5,551 acres of clearcut harvest under the project. In addition to the VEG S2 sideboard, additional design features would limit the size of regeneration harvest units to 40 acres and require minimum distances between regeneration harvest units to provide for effective cover and movement corridors between created openings. It is expected that affected mapped lynx habitat would be reduced proportional to the reduction in the overall regeneration harvest acres that is expected under the project in order to meet Standard Veg S2. Given there would be a 41% (approximate) reduction in regeneration harvest acres in lynx habitat when the project is implemented, the acreage of lynx habitat affected in the Multistory, Other, and Stand Initiation structures would be expected to decline as a result.

Clearest statement of the stand pool / 5,551 acres of treatments proposed.

Why this # (41%)?

Precommercial thinning is defined in the NRLMD ROD (USDA Forest Service 2007a) as "mechanically removing trees to reduce stocking and concentrate growth on the remaining trees, and not resulting in immediate financial return." Treatment types that fall under this definition proposed for this project include non-commercial thinning. These types of treatments would reduce horizontal cover, and, therefore, reduce the suitability of the treated stand for snowshoe hares in the winter. Under the Proposed Action a total of 1,325 acres of lynx habitat would be non-commercially thinned. Of that total, 534 acres are currently identified through lynx habitat mapping as being in an ESI or SI condition that provides suitable habitat for snowshoe hares in the winter: 5 acres of early stand initiation and 529 acres of stand initiation. While the treatment prescription on only 304 of these proposed treatment acres is non-commercial thinning, small diameter thinning for fuels treatment may occur in other treatment prescriptions (e.g. commercial thinning, Douglas-fir thinning, regeneration harvest) or in lieu of these treatments should they ultimately drop for logistical or other reasons. These 534 acres would no longer provide habitat for snowshoe hares in the winter in the short term; over time, growth of small diameter trees and other vegetation would move these stands back into a structural condition with sufficient horizontal structure to support snowshoe hare. Non-commercial thinning in the remaining 791 acres (1,325 acres – 534 acres) would occur in Other structure stands; these stands would be maintained in the Other structural stage following non-commercial thinning.

To be as conservative as possible in this analysis with respect to lynx, it was assumed that all treatment types that would occur in snowshoe hare habitat would reduce the suitability of that habitat for snowshoe hares. This project would affect up to 1,595 acres of snowshoe hare habitat (early stand initiation, stand initiation, and multistory structures combined) (Refer to Table 22 above). This would account for 19.2% of the 8,330 acres of snowshoe hare foraging habitat that is currently available in the LAU. As noted previously, it is expected that project sideboards, design features, and other restrictions will reduce these impacts to some degree once the current stand pool is put through these various "filters" and laid out on the ground.

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While it is assumed that treated stands would no longer be suitable for snowshoe hare foraging, the majority of treatments would retain overstory and understory trees and other vegetation that will provide structure that will provide for lynx movement across the landscape. Intermediate treatments (commercial thinning and Douglas-fir thinning) would maintain 40 to 100 feet of basal area (generally 20'-25' spacing between trees). Aspen improvement treatment would maintain existing aspen and those conifers not competing with or suppressing aspen stand regeneration. Activities designed to treat hazardous fuels conditions, non-commercial thinning, and burning would also retain live structure (understory and overstory) and dead wood features that contribute to stand complexity and hiding cover. Habitat features desired by alternate prey (e.g. red squirrel) would be maintained in commercially harvested, aspen restoration, non-commercial thinning, fuels treatment, and burning prescriptions. While some stands would be regeneration harvested to address the purpose and need for the project, the openings created in these stands would be no larger than 40 acres (and at least 500 feet would separate adjacent regeneration harvest units), distributed throughout the planning area within a matrix of suitable lynx habitat and other forested stands, and in areas with topographic variety. Following implementation, the juxtaposition of structural stages and compositions in the project area would provide for the movement of lynx across the landscape. No new development (residential development, paved road construction, etc.) would occur under this project that would be a barrier to lynx movement across the landscape.

Table 23 displays the effects of the Proposed Action by treatment type and lynx habitat structure affected. For purposes of analysis, the following assumptions are made:

- For ESI and SI structures, only those acres within the refined CWPP boundary would be affected by proposed activities. There will be no treatment of ESI or SI outside the CWPP in order to meet NRLMD standards. Exceptions to Veg S5 for treatment of ESI and SI for other resource benefit outside the CWPP would not be used under this project.

- Other structure habitat (by proposed treatment Rx) outside the fuels concern area was added to 80% of the Other acres (by proposed treatment Rx) that would be affected inside the fuels concern area. This was done to acknowledge that there may be some multistory habitat currently mapped as Other structure within the fuels concern area that may be affected by treatment activities. Pre-treatment surveys would be required in stands identified as potentially having adequate horizontal cover to support snowshoe hare to ensure effects to multistory do not exceed levels quantified in this analysis.

- Multistory habitat inside the fuels concern area (by proposed treatment Rx) was added to 20% of the Other acres (by proposed treatment Rx) that would be affected inside the fuels concern area. This was done to acknowledge that there may be some multistory habitat currently mapped as Other structure within the fuels concern area that may be affected by treatment activities. By doing this manipulation according to structure as well as prescription, these "Other" acres (now assumed to be multistory, even though only 373 acres classified as multistory would be affected) could be assigned a prescription, allowing for the calculation of post-treatment structure levels in the LAU. Pre-treatment surveys would be required in stands identified as potentially having

adequate horizontal cover to support snowshoe hare to ensure effects to multistory do not exceed levels quantified in this analysis.

- The treatment prescription for the estimated acres in each structure stage (ESI, SI, Other, and Multistory) was then used to determine the post-treatment structure for the affected acres (those within the current standpool). As noted previously, burning and clearcutting are assumed to convert all structure stands to an ESI condition, etc.

Table 23: Acres of lynx habitat affected by proposed treatments (shown per treatment type and habitat type).

Treatment Type	ESI[1]	SI[2]	Multistory[3]	Other[4]	Total
Regeneration[5]	0	69	406	7,262	7,737[8]
Thinning (Thin & Douglas-fir Thin)	2	122	483	4,160	4,767
Fuels Treatment[6]	0	26	84	589	700
Aspen Restoration	0	12	12	3	27
Burning	0	0	4	12	16
Non-commercial Thinning[7]	3	301	71	951	1,325
Total All Harvest	5	529	1,061	12,976	14,571

Notes:
[1]Stand Initiation structural stage where the trees have not grown tall enough to protrude above the snow in winter but can provide snowshoe hare habitat during the non-winter months and is typically moving toward year-round snowshoe hare habitat.
[2]Stand 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.
[3]Multistory structural stage with many age classes and vegetation layers that may provide year-round snowshoe hare habitat via dense horizontal cover.
[4]Other –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.
[5]Regeneration Harvest is defined in the NRLMD ROD (USDA Forest Service 2007a) as "The cutting of trees and creating an entire new age class; an even-age harvest. The major methods are clearcutting, seed tree, shelterwood, and group selective cuts." Treatment types that fall under this definition proposed for this project include clearcut harvest.
[6]Fuels Treatment may include prescribed burning (broadcast, understory, piles, jackpotting, etc.), fireline/fuelbreak construction, mastication, lop and scatter of fuels, machine/grapple piling of large accumulations of fuels, hand piling of fuels, thinning of generally small diameter trees, removal of conifer encroachment from aspen, willows, meadow, and sage communities.
[7]PCT or Precommercial thin as defined in the NRLMD ROD (USDA Forest Service 2007a): "Precommercial thinning is mechanically removing trees to reduce stocking and concentrate growth on the remaining trees, and not resulting in immediate financial return." Treatment types that fall under this definition proposed for this project include daylighting, and non-commercial thinning.
[8]As noted previously, the maximum number of acres of regeneration harvest in lynx habitat on NFS lands in the LAU would be 4,600 acres in order to be in compliance with Standard Veg S2 of the NRLMD. The spatial boundaries of actual regeneration harvest units (with maximum size specifications and requirements for untreated areas between regeneration harvest units, as specified in project sideboards and design features) would be determined during layout. At this stage a maximum of 4,600 acres of regeneration harvest in lynx habitat would be laid out in a manner that complies with project sideboards and design features, including Standard Veg S2. As a result, this value is expected to decrease

Table 24 below displays the post-implementation condition of lynx habitat in the South Madison LAU given the assumptions that were described previously and assuming all the acres in the current stand pool are implemented. As noted previously, sideboards, design features, and other requirements will reduce the amount of treatment when the project is put through these filters and laid out on the ground. It is expected that the actual acres of Multistory and Other stands post-implementation would be greater than displayed in Table 24 once sideboards and other requirements are applied to the current stand pool (i.e. less treatment in these structure types).

Table 24: Post-project Lynx Habitat within the South Madison LAU

LAU Name	LAU Total Acres	Total Lynx Habitat Acres	Post- Stand Initiation[1] (provides winter forage) Acres (% of lynx habitat)	Post- Early Stand Initiation[2] (provides summer forage only) Acres (% of lynx habitat)	Post- Multistory[3] Acres (% of lynx habitat)	Post- Other[4] (Does not provide forage e.g. stem exclusion) Acres (% of lynx habitat)
South Madison[5,6]	39,943	31,587	3,235 (10.2%)	8,695 (27.5%)	3,023 (9.6%)	16,633 (52.7%)

[1]Stand 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.

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

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

[4]Other –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.

[5]As noted previously, the maximum number of acres of regeneration harvest in lynx habitat on NFS lands in the LAU would be 4,600 acres in order to be in compliance with Standard Veg S2 of the NRLMD. The spatial boundaries of actual regeneration harvest units would be determined during layout. At this stage a maximum of 4,600 acres of regeneration harvest (of the 7,737 acres of regeneration harvest in lynx habitat that is accounted for in the ESI calculation above) would be laid out in a manner that complies with project sideboards and design features, including Standard Veg S2. As a result, the acres of Early Stand Initiation (which generally is the result of regeneration harvest) in the table above is greater than is expected to occur on the ground once project layout occurs. Conversely, the acres of Multistory and Other structure are lower than what would be expected in the LAU once the project is laid out on the ground due to reduction in the amont of regeneration harvest that must occur in order to meet NRLMD Standard Veg S2.

[6]Acres of multistory stands affected (1,061 acres) under the proposed action is also inflated because a portion (20%) of Other structure acres in treatment units in the fuels concern area is included in the estimate of multistory acres affected by the project. Doing so provides for accounting of multistory acres inside the fuels concern area that may currently be misclassified as "Other" structure and that would be affected by proposed treatments. In actuality, there are 373 acres of mapped multistory that would be affected; the remainder of the 1,061 acres used to calculate the post-implementation condition of multistory is currently classified as Other structure (688 acres). When the total of 1,061 acres is subtracted from the existing total of mapped Multistory structure habitat in the analysis area, the calculation above (3,023 acres of multistory post-implementation) is the result.

Post-implementation, there would be approximately 17.3% of the LAU in an Early Stand Initiation if all of the acres in the current stand pool, except for regeneration harvest in lynx habitat in excess of 4,600 acres, were treated. Multistory habitat would make up 9.6% of the LAU, assuming that all treatment activites are implemented. It is likely that the level of multistory structure in the LAU post-implementation would be higher than 9.6% as it was assumed a portion (20%) of Other structure stands in the fuels concern area were multistory structure for analysis purposes and would be affected by treatment. The reduction in regeneration harvest to meet VEG S2 would also likely result in more acres of multistory present in the post-implementation condition. As stated in USDI (2003) and USDA Forest Service (2007b), , lynx have evolved to adapt to a shifting boreal forest composed of a mosaic of species, stand

ages, and structures to support snowshoe hares. That document also stated that lynx operate at large scales and an activity would have to occur across a very large area (at least several home ranges) to significantly impact a local lynx population (USDI 2003, pg. 40083). The Proposed Action would maintain a mosaic of habitat across the LAU. While impacts would occur over a relatively large area, residual stands and untreated areas would support primary and secondary prey for lynx and allow for movement of lynx across the landscape. The proposed activities would be consistent with all NRLMD standards; exemptions to Standards Veg S5 and S6 for fuels treatment activities that precommercially thin stand initiation habitat and reduce snowshoe hare habitat in multistory stands within the Wildland Urban Interface would be applied under this project.

Collectively, proposed treatment would impact approximately 13,576 acres (629 Multistory + 12,947 Stem Exclusion) of denning habitat when the current stand pool is overlaid with potential denning habitat in the LAU. This would equate to 55% of the available denning habitat in the LAU. Of this total, 12,624 acres of denning habitat would be affected by regeneration harvest, thinning, fuels treatment, and burning prescriptions. Actual impacts to denning habitat would be less as project sideboards and design features would reduce the amount of treatment and certain treatment types (e.g. regeneration harvest, which is expected to decrease by approximately 3,236 acres in lynx habitat) in order to comply with the NRLMD and other management direction. Regeneration harvest, thinning, and fuels treatment (potentially) would have direct effects that alter lynx habitat so that it no longer provides the structure favorable for denning habitat. It was assumed that existing denning habitat within these prescription types (and broadcast burning) would no longer be suitable for denning post-implementation. Snag and dead wood retention levels in treatment units would meet the Forest Plan standard for these features. Indirect effects of treatment could continue to impact lynx denning habitat over time, since materials removed as commercial product would not be available to contribute coarse woody debris as trees die and fall. On the other hand, commercial thinning could also provide a favorable habitat matrix where larger canopy openings allow regeneration of conifer seedlings that could provide good foraging habitat in close proximity to denning habitat maintained within or adjacent to thinned units. Thinning prescriptions could also eventually produce multi- storied stands with dense understory cover that provides high quality snowshoe hare foraging habitat. Denning habitat would be relatively well-distributed in the LAU following treatment but would occur in smaller patches than the pre-treatment condition.

Habitat connectivity is important in terms of providing adequate cover to allow for lynx to move within and between LAUs. Linkage areas are identified where factors placing habitat connectivity at risk, such as highways or private land developments, are currently separating large contiguous blocks of lynx habitat. The linkage area identified in the South Fork Madison LAU emphasizes the importance of maintaining habitat to facilitate movement across US Highway 20 in the vicinity of Targhee Pass.

Some of the proposed project activities, including Douglas-fir thinning, fuels treatment, and commercial thinning occur in the vicinity of this linkage area. Although mapped regeneration harvest is proposed in a portion of the linkage area, no regeneration harvest would occur in the linkage area. A wildlife design feature requires there to be no regeneration harvest in the linkage area. These activities could affect habitat connectivity and lynx movement patterns between high elevation areas in this LAU and adjacent LAUs. The proposed action would concentrate treatment in the vicinity of private lands and other values at risk; in this case, treatments would be concentrated close to Highway 20. Treatment activities in this area could affect the distribution of snowshoe hares, red squirrels, and other lynx prey species. Presence and abundance of prey species, combined with availability of security cover, are key factors in lynx habitat use patterns. Not all cover would be lost in the vicinity of this linkage area. Fuel reduction treatments proposed involve thinning of both commercial and non-commercial products, but in most cases would still leave enough trees standing to provide adequate cover to maintain travel and resting habitat for lynx. Commercial thinning and Douglas-fir thinning would also maintain overstory and understory

structure that will contribute to habitat connectivity. There would be no permanent loss of habitat or conversion of boreal forest under this project and there would be no barriers to lynx movement created. The proposed activities may impact the way in which lynx use and move across the landscape to some degree. As forested structure would be retained in all harvested patches, this project would comply with NRLMD Standard ALL S1.

Forested ridges and saddles provide secure travel corridors and contribute to habitat connectivity. Major ridgelines providing potential movement corridors are not present in the project area. Less prominent ridgelines and saddles are present. Fuels treatment activities may include construction of fuel breaks in strategic locations near values at risk. Fuels breaks can benefit fire suppression efforts by creating strategic locations to defend and hold a fire. Fuels breaks can provide for quicker access and ease of line construction for equipment and hand crews. The NRLMD recommends against constructing permanent fire breaks on ridges or saddles (Guideline VEG G4). If fuel breaks are created, they would not be situated on saddles or ridges and would be compliant with NRLMD Guideline VEG G4; a design feature was created to ensure project compliance.

Temporary road construction associated with timber harvest can affect lynx habitat connectivity and habitat. Up to 56 miles of temporary road could be constructed to facilitate implementation activities. Additional impacts to lynx habitat would result from temporary project road construction. This activity would result in impacts to lynx habitat similar to those described for vegetative treatment units (vegetation removal). Temporary roads would not result in a permanent conversion of habitat; after project implementation is complete and these roads are decommissioned, they would support the growth of vegetation that would provide snowshoe hare forage in the future. Temporary project roads outside of treatment units would have minor additional impacts on lynx foraging habitat. There would be approximately 11.8 acres (6.6 acres Multistory, 4.7 acres Stand Initiation, and 0.5 acres Early Stand Initiation) of additional impact on snowshoe hare foraging habitat as a result of temporary road construction outside of treatment units. Project roads built to access harvest units would be temporary and designed for effective closure upon completion of harvest activities (NRLMD HU G9). Public motorized use of project roads would be prohibited, and non-motorized use would be discouraged by project operations. As these project roads would be temporary, their impact to habitat and connectivity is expected to be minor.

5.2.5.2 Cumulative Effects of the Proposed Action

Past actions that have affected lynx foraging habitat in the South Madison LAU include timber harvest (commercial thinning, regeneration harvest, post and pole thinning, etc.) on public land, trails construction/reroutes, wildfires, and development on private lands. Past timber harvest, wildfires, trails work, and activities on private lands have contributed to the current status of the landscape within the South Madison LAU with respect to lynx foraging habitat and as described in the Affected Environment section for this resource. Past timber harvest was a mix of even-aged and uneven-aged treatments, which contributed to the mosaic of lynx habitat in the LAU. These activities created openings where dense regeneration (stand initiation snowshoe habitat) has grown and thinned stands, contributing to regeneration of small diameter conifers and ultimately multi-story stand conditions. Over the last 10 years, there have been approximately 8.2 acres of regeneration timber harvest (associated with road right-of-way clearing) in the LAU. An additional 6 acres of regeneration occurred in the Rendezvous Ski Trails area associated with rerouting of existing trails; abandoned sections of trail were rehabilitated. There has also been pruning and thinning associated with the West Yellowstone to Reas Pass Rails-To-Trail Project. This project is converting an existing abandoned railroad to a non-motorized walking and biking trail.

Large wildfires (>100 acres) occurred in the LAU in 1988 and 2013; a small number of fire starts occur annually, but these tend to be aggressively contained in this area due to prevailing wind conditions, existing fuels conditions, and the proximity to West Yellowstone. Large fires in the LAU created early stand initiation structure stands; ESI structure created by fires in 1988 has generally transitioned into a stand initiation structural class that provides winter foraging habitat for snowshoe hares. Approximately 278 acres of lynx habitat is present on private lands in the LAU. There have been activities on these acres (including home building) that likely has affected the suitability of these acres for lynx.

In the future, there are no reasonably foreseeable future activities with a potential to affect lynx habitat. While further development of private lands are possible, none are currently known. When combined with past, ongoing, and reasonably foreseeable future actions in the South Madison LAU, this project would further contribute to the mosaic of structural stages that characterize the LAU. Lynx evolved to adapt to shifting habitat conditions across the landscape, and the Proposed Action would contribute to that diversity. In comparison to the size of the entire LAU, the quantity of acres proposed for treatment under the Proposed Action is relatively high. Given sideboards and other limitations that will reduce treatment acres and potential impacts to lynx and lynx habitat, and the fact that the project was designed to meet NRLMD standards (with application of the WUI Exemption to Veg S5 and S6 within the fuels concern area, not the entire WUI), it is not expected that there would be an adverse cumulative impact on the lynx.

5.2.6 Consistency with FP Direction specific to Canada Lynx

The Record of Decision (ROD) for the Northern Rockies Lynx Management Direction (NRLMD) became effective July 16, 2007 (USDA 2007a) and incorporates Terms and Conditions (T&C's) of the Biological Opinion and Incidental Take Statement (USDI 2007b). The Record of Decision for the Custer Gallatin Forest Plan (USDA 2022) was signed in January 2022. The US Fish and Wildlife Service issued a Biological Opinion for the 2022 Custer Gallatin Forest Plan in January 2022 (USDI 2022). The Biological Assessment and Biological Opinion for the Forest Plan provided updated limits to the acreage of lynx habitat that may be treated under the WUI exemption (applying to fuels treatment projects only) and for precommercial thinning for other resource benefit for the entire Custer Gallatin National Forest for the life of the new plan. The Incidental Take Statement for the Forest Plan Revision replaces the previous take statement for NRLMD (USDI 2017b). The limits provided in the 2020 BA and 2022 BO (USDA 2020 and USDI 2022) will be used for this project and subsequent projects. The Service determined that by following the NRLMD, the 2022 Custer Gallatin Foret Plan will reduce the potential for incidental take of Canada lynx. As the Custer Gallatin incorporated the Service's previous terms and conditions associated with the NRLMD into the new Plan through inclusion of Standards FW-STD-WLLX-01 and FW-STD-WLLX-02, no additional reasonable and prudent measures or terms and conditions were provided by the Service to minimize the impacts of incidental take of Canada lynx (USDI 2022). Compliance with the NRLMD is summarized in Table 25. Compliance with Forest Plan guidance (USDA 2022) is described in Table 26.

Table 25: Applicable Northern Rockies Lynx Management Direction Standard and Guideline Compliance

STANDARD/GUIDELINE	DESCRIPTION	PROJECT COMPLIANCE
ALL MANAGEMENT PRACTICES AND ACTIVITIES (ALL): The following standards and guidelines apply to all management projects in lynx habitat within LAUs in occupied habitat.		
Standard ALL S1	New or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.	The project would alter structural stages of potential lynx habitat but would not result in construction of

STANDARD/GUIDELINE	DESCRIPTION	PROJECT COMPLIANCE
		any barriers known to inhibit lynx movements. Habitat connectivity would be provided by untreated stands and stands treated using intermediate harvest methods (commercial thinning, aspen enhancement, fuels treatment, etc.). Regeneration harvested stands would not be considered a barrier to movement, as research has shown that lynx will pass through these areas (Holbrook et al. 2018). High traffic volumes would not result from this project.
Guideline ALL G1	Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal land. Methods could include fencing, underpasses, or overpasses.	Not applicable to this project.
Standard LAU S1	Changes in LAU boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.	Not applicable to this project.
VEGETATION MANAGEMENT ACTIVITIES AND PRACTICES (VEG): The following standards and guidelines apply to vegetation management projects in lynx habitat within LAUs in occupied habitat.		
Standard VEG S1	**Where and to what this applies**: Standard VEG S1 applies to all vegetation management projects that regenerate forests, except for fuel treatment projects within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects within the WUI see guideline VEG G10. **The Standard:** Unless a broad scale assessment has been completed that substantiates different historic levels of Stand Initiation structural stages, limit disturbance in each LAU as follows: If more than 30 percent of the lynx habitat in an LAU is currently in a Stand Initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects.	Under the existing condition, 1.5% of the lynx habitat in the South Madison LAU is in a Stand Initiation structural stage that does not yet provide winter snowshoe hare habitat (referred to in this report as "Early Stand Initiation" or ESI). This is well below the 30% maximum threshold. Implementation of all of the treatment acres in the current stand pool (which would not occur – see previous discussions regarding sideboards, design features, and other requirements that will reduce treatment) would result in approximately 5,459 acres of ESI structure in the LAU after approximately 3,236 acres of regeneration harvest in lynx habitat are dropped to meet Standard VEG S2. This equates to 17.3% of the lynx habitat in the LAU. Therefore, this standard is met and the project would not result in violation of this standard.
Standard VEG S2	**Where and to what this applies:** Standard VEG S2 applies to all timber management projects that regenerate	Timber management activities would regenerate up to 4,600 acres

STANDARD/GUIDELINE	DESCRIPTION	PROJECT COMPLIANCE
	forests, except for fuel treatment projects within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects within the WUI see guideline VEG G10. **The Standard:** Timber management projects shall not regenerate more than 15 percent of lynx habitat on NFS lands within an LAU in a 10-year period.	of lynx habitat in the South Madison LAU. The South Madison LAU contains 31,587 acres of lynx habitat; of this total, there are 31,309 acres of lynx habitat on NFS lands in the LAU. Up to 4,697 acres of lynx habitat could be regenerated on NFS lands in the LAU over a ten year period for this standard to be met. There has been approximately 14 acres of regeneration harvest in the LAU in the last 10 years. Activities that would regenerate lynx habitat would occur on 14.7% of the lynx habitat (4,614/31,309 acres) on NFS lands in the LAU over a ten year period. As this is less than 15% of the lynx habitat on NFS lands within the LAU, this project would be consistent with Standard VEG S2.
Standard VEG S5	**Where and to what this applies:** Standard VEG S5 applies to all pre-commercial thinning projects, except for fuel treatment projects that use pre-commercial thinning as a tool within the WUI as defined by HFRA, subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects within the WUI see guideline VEG G10. **The Standard:** Pre-commercial thinning projects that reduce snowshoe hare habitat may occur from the Stand Initiation structural stage until the stands no longer provide winter snowshoe hare habitat only: 1. Within 200 feet of administrative sites, dwellings, or outbuildings; 2. For research studies or genetic tree tests evaluating genetically improved reforestation stock; 3. Based on new information that is peer reviewed and accepted by the regional level of the Forest Service, and state level of FWS, where a written determination states: that a project is not likely to adversely affect lynx; or that a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat; 4. For conifer removal in aspen, or daylight thinning around individual aspen trees, where aspen is in decline; 5. For daylight thinning of planted rust-resistant white	All precommercial thinning treatment units that would reduce snowshoe hare habitat are located in the refined CWPP WUI boundary for Gallatin County. Small tree thinning would occur on up to 534 acres of Stand Initiation and Early Stand Initiation habitat that does not meet the exceptions to Standard VEG S5. Pre-commercial thinning of these 534 acres of snowshoe hare habitat would be exempted from this standard, as they are located in WUI. The WUI exemption states that fuels treatment projects within the WUI that do not meet VEG S5 or VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). The 2020 Biological Assessment and 2022 Biological Opinion (USDA 2020 and USDI 2022) for the Custer Gallatin Forest Plan (USDA 2022) quantifies the acreage of fuel treatment that may occur under the exemption in the WUI for the Forest over the life of the Plan. The BA and BO also provide a limit to the acreage of precommercial thinning that may occur under the exceptions to Veg S5;

STANDARD/GUIDELINE	DESCRIPTION	PROJECT COMPLIANCE
	pine where 80% of the winter snowshoe hare habitat is retained; 6. To restore whitebark pine. *Exceptions 2 through 6 shall only be utilized in LAUs where Standard VEG S1 is met.*	precommercial thinning under this project would not fall under one of the exceptions, so this limit is not applicable to this project. For the Custer Gallatin National Forest, the maximum acres treated using the exemption for fuels treatment projects in the WUI is 46,865 acres (USDI 2022, page II-73). This project would treat a total of 1,595 acres (534 acres precommercial thinning under VEG S5 + 1,061 acres of vegetation management in multistory under VEG S6) of lynx habitat that do not meet the exceptions under VEG S5 or VEG S6. These 1,595 acres would be applied to the maximum acres treated using the exemption for fuels treatment projects in the WUI (USDI 2022). The current total for the Forest is zero (0) acres, as no other projects affecting snowshoe hare habitat and applying the WUI exemption have occurred. The cumulative total of WUI exempted acres for the Custer Gallatin National Forest would therefore be 1.595 acres (0 + 1,595). The cumulative total of 1,595 acres is less than 46,865 acres (USDI 2022); therefore, this project would be in compliance with the limit for exemption acres for fuels treatments in WUI.
Standard VEG S6	**Where and to what this applies:** Standard VEG S6 applies to all vegetation management projects except for fuel treatment projects within the WUI as defined by HFRA, subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynxhabitat on each administrative unit (a unit is a National Forest). For fuel treatment projects within the WUI see guideline VEG G10. **The Standard:** Vegetation management projects that reduce snowshoe hare habitat in Multistory mature or late successional forests may occur only:	This project would result in treatments being implemented in up to 1,061 acres of multi-storied habitat that do not meet the exception criteria listed for Standard VEG S6. These 1,061 acres of treatment in Multistory snowshoe hare habitat would be exempted from this standard, as they are located in WUI. The WUI exemption states that fuels treatment projects within the WUI that do not meet VEG S5 or VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). The

STANDARD/GUIDELINE	DESCRIPTION	PROJECT COMPLIANCE
	1. Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or 2. For research studies or genetic tree tests evaluating genetically improved reforestation stock; or 3. For incidental removal during salvage harvest (e.g., removal due to location of skid trails). (NOTE: Timber harvest is allowed in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover [e.g. uneven age management systems could be used to create openings where there is little understory so that new forage can grow]).	2020 Biological Assessment and 2022 Biological Opinion (USDA 2020 and USDI 2022) for the Custer Gallatin Forest Plan (USDA 2022) quantifies the acreage of fuel treatment that may occur under the exemption in the WUI for the Forest over the life of the Plan. For the Custer Gallatin National Forest, the maximum acres treated using the exemption for fuels treatment projects in the WUI is 46,865 acres (USDI 2022, page II-73). This project would treat a total of 1,595 acres (534 acres precommercial thinning under VEG S5 + 1,061 acres vegetation management in multistory under VEG S6) of lynx habitat that do not meet the exceptions under VEG S5 or VEG S6. These 1,595 acres would be applied to the maximum acres treated using the exemption for fuels treatment projects in the WUI (USDI 2022). The current total for the Forest is zero (0) acres, as no other projects affecting snowshoe hare habitat and applying the WUI exemption have occurred. The cumulative total of WUI exempted acres for the Custer Gallatin National Forest would therefore be 1,595 acres (0 + 1,595). The cumulative total of 1,595 acres is less than 46,865 acres (USDI 2022); therefore, this project would be in compliance with the limit for exemption acres for fuels treatments in WUI.
Guideline VEG G1	Vegetation management projects should be planned to recruit a high density of conifers, hardwoods, or shrubs, where such habitat is scarce or not available. Priority for treatment should be given to stem-exclusion, closed-canopy structural stands to enhance habitat conditions for lynx (e.g. mesic, monotypic lodgepole stands).	Vegetation management under the South Plateau Project would stimulate recruitment of conifers, hardwoods, and shrubs. A combination of regeneration and intermediate harvest would occur in the LAU. Where mixed conifer stands or lodgepole pine stands that are >6 inches dbh and <80-90 years old, stands would be thinned to as basal area of 40-100 feet. The vast majority (89%) of affected lynx habitat would be in the Other

STANDARD/GUIDELINE	DESCRIPTION	PROJECT COMPLIANCE
		structure stage. Openings in the canopy created by removal of larger trees would allow more sunlight to penetrate to the ground, which could stimulate understory re-growth and accelerate the development of a Multistory stand structure and snowshoe hare foraging habitat in the future in these stands.
Guideline VEG G4	Prescribed fire activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.	No new permanent travel routes would be created. Decommissioning of a portion of the South Fork Madison River Road would have no impact on current snow compaction, as this route is already closed to snowmobile use in the winter. Fuel breaks, if constructed, would not be located on or near ridgelines or in saddles (a design criteria was included in the project to address this Guideline). The Wildlife Biologist and fuels specialist will collaborate regarding the location of potential fuel breaks and ways to reduce potential impacts to multistory stands in the fuels concern area.
Guideline VEG G5	Habitat for alternative prey species, primarily red squirrel, should be provided in each LAU.	While the quality of alternate prey habitat (red squirrel) may be eliminated or reduced in treatment units, high quality squirrel habitat would be abundant in the South Madison LAU following implementation. Patches of suitable habitat would likely be available in commercial thin units, aspen units, fuels treatment units, broadcast burn units, and to some extent in pre-commercial thin units. Broadcast burning and other treatment that promotes hardwood (aspen) regeneration would benefit grouse, another alternate prey species for lynx.
Guideline VEG G10	Fuel treatment projects within the WUI as defined by HFRA should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation	VEG S1 and S2 would be met. VEG S5 and S6 would also be met as the WUI exemption would be used to treat fuels in multistory mature stands and precommercially thin young stands. Fuels treatments were designed to balance the need to improve public safety with

STANDARD/GUIDELINE	DESCRIPTION	PROJECT COMPLIANCE
		minimizing impacts to wildlife species such as lynx. As multistory habitat was noted as being relatively limited in the LAU, this structure would only be affected within the area within ½ mile of values at risk and along strategically identified routes outside ½ mile of VAR in order to change fire behavior and reduce undesired impacts.
Guideline VEG G11	Denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris. If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris piles or residual trees to provide denning habitat in the future.	Denning habitat for lynx is not a limiting factor in this LAU. There are 13,630 acres of potential denning habitat that intersects the current stand pool. This represents approximately 55% of the potential denning habitat in the LAU, which totals 24,932 acres. It is expected, given sideboards, design features, and other requirements that will place limits on the amount of treatment, size of some treatment units, and other factors, that the actual impacts to denning habitat would be less. Design features would provide for downed wood retention in treatment units.
Guideline HU G9	On new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives.	No public motorized use of temporary project roads would be permitted; signage, gates, or barricades would be used to restrict unauthorized use. All temporary project roads would be decommissioned when activities associated with individual temporary roads are completed.

Table 26: Compliance with Forest Plan Direction for Canada Lynx.

Standard/Guideline	Compliance
FW-STD-WLLX-01 The Northern Rockies Lynx Management Direction in plan appendix G shall be applied.	Yes – Refer to Table 25 above for compliance with applicable NRLMD direction and compliance with 2020 BA/2022 BO limits and Incidental Take Statement for application of exemptions/exceptions to NRLMD Standards..

FW-STD-WLLX-02 To ensure that Northern Rockies Lynx Management Direction exemptions for fuel treatment do not disproportionately affect designated critical habitat for lynx, vegetation management projects for fuel treatment in wildland-urban interface that reduce snowshoe hare habitat, shall occur on no more than 6 percent cumulatively of the lynx habitat (excluding matrix) within designated lynx critical habitat on the Custer Gallatin National Forest.	Not Applicable – This Project is entirely outside of Canada lynx Designated Critical Habitat.

5.2.7 Summary of Effects of the Proposed Action on Canada Lynx

The Proposed Action is in compliance with NRLMD direction, 2022 Custer Gallatin Forest Plan standards, and 2022 Biological Opinion limits for the use of exemptions and exceptions to NRLMD standards.

The South Plateau Project would affect up to 1,595 acres of existing snowshoe hare foraging habitat. This includes 6 acres in an early stand initiation structural stage, 529 acres in a stand initiation structure, and up to 1,061 acres of multistory structure habitat. This accounts for approximately 19% of the existing snowshoe hare foraging habitat in the South Madison LAU. Approximately 1,595 acres would be treated using the exemption to NRLMD standards VEG S5 and S6 for fuels treatment projects in the wildland urban interface. The proposed activities would reduce horizontal understory cover used by snowshoe hare for foraging. Multi-story habitat would account for approximately 10% of the LAU following implementation. Although the current stand pool is expected to impact approximately 14,572 acres of lynx habitat, adjustments made during layout would result in a decrease in regeneration harvest in lynx habitat in order to meet NRLMD Standard VEG S2. At least 3,236 acres of lynx habitat proposed for regeneration harvest would be dropped in order to meet this standard, resulting in impacts to approximately 11,336 acres (14,572 – 3,236 acres) of lynx habitat. These impacts would occur throughout the LAU. In the context of the LAU, this level of impact would be relatively large in the short term; however, most of the affected acres do not currently provide adequate horizontal cover to provide snowshoe hare forage, and the proposed treatments would increase habitat heterogeneity and provide for regeneration and in-growth of understory vegetation in the long term. At the landscape and regional scale, the South Plateau project would not appreciably impact overall habitat quality or reduce connectivity of lynx habitat. Lynx habitat in the South Madison LAU is not unique; it lies adjacent to Yellowstone National Park in a portion of the project area, it is otherwise indistinguishable from other LAUs on the District and Forest. For the above reasons, the Proposed Action may affect, and is likely to adversely affect the Canada lynx. Although this is the case, the Proposed Action is not expected to significantly impact the species. While snowshoe hare foraging habitat would be affected in the short term, the proposed activities would promote heterogeneity at the LAU scale and would encourage the growth of understory vegetation that snowshoe hare are dependent on in the mid and long term. The project would be consistent with lynx management direction, including all standards (and associated exemptions).

5.3 North American Wolverine

5.3.1 Issue

The North American wolverine is known to occur in the Henry's Mountains. Forest health and fuels treatment activities have the potential to cause disturbance to wolverine and their prey, affect habitat quality for wolverine and prey, and affect the distribution of prey in potential habitat.

5.3.2 Resource Indicators and Measures

Effects to wolverine were evaluated in terms of how project activities would impact wolverine habitat (maternal, primary, and dispersal) and cause displacement of wolverine or their prey species. There are no established thresholds for these indicators that are used by the Forest as a target level for which to manage. One guideline in the 2022 Custer Gallatin Forest Plan addresses wolverine. Guideline FW-GDL-WLWV-01 states: *To provide secure habitat for reproductive wolverines, there should be no increase in special use authorizations or designation of winter routes in maternal habitat for wolverines during the reproductive denning season.* As this project is not a special use authorization and does not affect designation/length of winter routes in maternal habitat, it would not be applicable to this project. The Forest Plan and the proposed rule do not contain any quantitative standards specific to these indicators. The conclusion of how changes in these indicators would affect wolverine was, therefore, qualitative in nature.

Table 27: Resource indicators and measures for assessing effects on wolverine

Issue	Resource Indicator	No Action	Proposed Action	Used to Address P/N or Key Issue?	Source
Project has the potential to cause displacement through disturbance	Extent of disturbance (acreage of habitat affected)	• No effect	• Possible displacement from treatment units during implementation	No	Review of effects of similar activities from pertinent scientific literature
Project has the potential to cause displacement through alteration in prey distribution	Effect on prey distribution	• Ongoing fire suppression → no change • Insect/disease outbreak → potential for short-term loss of forage and cover	• Short-term displacement of prey species. • Long-term enhancement of habitat conditions for prey species (forage and disturbance)	No	Review of effects of similar activities from pertinent scientific literature

5.3.3 Methodology and Information Sources

5.3.3.1 Spatial and Temporal Context for Analysis

The analysis area for wolverine consists of all lands within the state of Montana in the four 12 digit HUC subwatersheds that intersect the project area (see Figure 14). This area is approximately 97,423,000 acres,

or 152 mi^2 in size. The average home range size of an adult female in the Greater Yellowstone Area is 128 mi^2, so the analysis area could accommodate one to two adult females, if it consisted of suitable habitat.

The temporal bounds for this analysis were the time of project initiation through the time where distribution of prey would no longer be impacted. As explained in the analysis for elk, this time frame would generally be about 15 years after project completion.

5.3.3.2 Methods Used for Analysis

5.3.3.2.1 Disturbance

Mapping of wolverine habitat in the Northern Region of the Forest Service is based on the work of Inman et al. (2013). Mapping utilized radio-telemetry data collected in the Yellowstone Region of the United States and Resource Selection Function (RSF) modelling. This work produced four habitat layers: maternal habitat, primary habitat, female dispersal habitat, and male dispersal habitat. As the layer for male dispersal is larger than the female dispersal layer, this habitat layer will be used when discussing "dispersal" habitat. While portions of the subwatersheds included in the wolverine analysis area extend into Wyoming, modeled data was not readily available for Yellowstone National Park lands. Potential maternal (denning) habitat, primary habitat (approximately equivalent to suitable foraging habitat), and dispersal habitat were overlaid with the existing stand pool to guage potential disturbance impacts within these habitat types.

5.3.3.2.2 Prey Distribution

The analysis of effects on elk distribution was relied upon to infer subsequent effects on wolverine foraging opportunities.

5.3.4 Regulatory Framework

The North American wolverine was proposed to be listed as a threatened species under the Endangered Species Act (ESA) by the U.S. Fish and Wildlife Service (FWS) in February 2013 (USDI Fish and Wildlife Service 2013). The following year the FWS withdrew their proposed rule (USDI Fish and Wildlife Service 2014). The District Court for the District of Montana subsequently vacated the 2014 withdrawal of the proposed rule in 2016 after legal challenges were filed against the agency. The FWS responded by reopening the comment period on the 2013 proposed rule and initiated a new status review of the species (USDI Fish and Wildlife Service 2016). This included completion of a Species Status Assessment (SSA) to help inform their decision-making process (USDI Fish and Wildlife Service 2018). In October 2020, the agency withdrew their 2013 proposed rule to list wolverine as threatened (USDI Fish and Wildlife Service 2020). Additional litigation followed, and the FWS requested a voluntary remand of their decision in the spring of 2022. On May 26, 2022, the District Court for the District of Montana vacated the 2020 withdrawal of the proposed rule and wolverine was once more considered "proposed" under the ESA. Proposed species on National Forest System lands are managed under the authority of the Federal Endangered Species Act (PL 93-205, as amended) and the National Forest Management Act (PL 94-588). Under provisions of the ESA, Federal agencies shall use their authorities to carry out programs for the conservation of listed species, and shall ensure that any action authorized, funded, or implemented by the agency is not likely to jeopardize the continued existence of proposed species (16 USC 1536).

Climate change and inadequacy of existing regulatory mechanisms to climate change, harvesting/trapping, and small population size were identified as the primary and secondary threats to the wolverine DPS, respectively, per the USFWS five factor analyses (USDI 2013b). Wolverine are not

thought to be dependent on specific vegetation or habitat features that might be manipulated by land management activities, nor is there evidence to suggest that land management activities are a threat to the conservation of the species (USDI 2013b).

5.3.5 Affected Environment

Wolverines occupy areas in the west-northwestern United States, and have recently dispersed into historically occupied areas, including California, Utah, Colorado, and Oregon; verified reproducing wolverine populations are found in Idaho, Washington (Northern Cascades), Montana, and northwest Wyoming. The FWS noted 72% of their Current Potential Extend of wolverine occurrence in the lower 48 states is on lands managed by the federal government (Figure 3, USDI Fish and Wildlife Service 2018). They also evaluated Inman et al.'s (2013) modeled wolverine primary habitat and estimated that 96 percent of modelled wolverine habitat are owned or managed by Federal agencies and 41 percent of this area is located in designated wilderness areas (USDI Fish and Wildlife Service 2018).

Wolverines in the contiguous United States are considered to represent a metapopulation and occupy habitat in high alpine patches at low densities where they disperse into suitable areas (Inman et al. 2012). In the contiguous United States, density estimates ranged from 3.5 per 1,000 km2 for the Greater Yellowstone region (2001–2008), 4.5 per 1,000 km2 for central Idaho (1992–1995), to 15.4 per 1,000 km2 for northwestern Montana (1972–1977)(Inman et al. 2012). Inman et al. (2013) estimated a population size of 318 wolverines in the currently known breeding range (i.e., Northern Continental Divide and portions of the Salmon-Selway, Central Linkage, Greater Yellowstone, and Northern Cascade ecosystems). This represents approximately half of the estimated capacity of core areas, including currently unoccupied areas in the Sierra Nevada and Southern Rockies that have the potential to contribute significantly to the population.

Male and female wolverines maintain large territories with very little overlap between same-sex adults, but breeding pairs have overlapping territories. Wolverine home ranges vary greatly in size depending on availability and distribution of food and gender and age of the animal. Studies on wolverines in the northern Rocky Mountain states (Montana, Idaho, Wyoming) observed adult male home ranges of 521 – 1,582 km2 and adult female home ranges of 139 - 384 km2 (USDI Fish and Wildlife Service 2018). Work based on recent telemetry studies in a four-state area done by Lukacs et al. (2020) demonstrates recent expansion into areas such as the southern Cascade Mountains in Washington and Wind River Range in Wyoming. They also demonstrated that wolverine occupancy varies by ecosystem. Specifically, the Northern Continental Divide Ecosystem demonstrated the highest predicted occupancy, Central Idaho and the Cascade Mountains in Washington showed an intermediate occupancy rate, and the Greater Yellowstone Ecosystem had a lower occupancy (Lukacs et al. 2020).

Year-round habitat for the wolverine is found at high elevations centered near the tree line in conifer forests (below tree line), rocky alpine habitat above tree line, cirque basins, and avalanche chutes that have food sources (USDI Fish and Wildlife Service 2013 and 2018). Deep, persistent, and reliable spring (mid-April to mid-May) snow cover is the best overall predictor of wolverine occurrence, possibly due to the species' need for deep snow during the denning period (ibid). Wolverines do not appear to depend on a certain vegetative component or other biological ecosystem attributes. Wolverines appear to select areas that are cold and receive enough winter precipitation to reliably maintain deep persistent snow late into the warm season (ibid). The requirement of cold, snowy conditions means that, in the southern portion of the species' range where ambient temperatures are warmest, wolverine distribution is restricted to high elevation areas. Overall, the best available information indicates that within the contiguous United States the wolverine's physical and ecological needs include large territories in relatively inaccessible landscapes; at high elevation (1,800 to 3,500 meters (5,906 to 11,483 feet)); access to a variety of food

resources that varies with seasons; and physical/structural features (e.g., talus slopes, rugged terrain) linked to reproductive behavioral patterns (USDI Fish and Wildlife Service 2018).

The wolverine is known to occupy the Madison and Henry's Lake Mountain Ranges. The NRM wildlife database (2019) contains one anecdotal wolverine observation in the Project Area and another just north of the Project Area. In addition, the Montanan Natural Heritage Program database and map viewer contain one anecdotal observation and two furbearer harvests of wolverine in the Project area, with the last observation in 2000. More recently, Montana Fish Wildlife & Parks has conducted wolverine monitoring efforts throughout the west and southwest portion of the state (and the larger Montana, Idaho, Wyoming, and Washington area) in the winter of 2016-2017. Dr. Bob Inman, a renowned wolverine expert in the Greater Yellowstone Ecosystem, indicated that camera traps were not placed in the Henry's Mountains during these surveys. However, his team did monitor a female in the Henry's Mountains between approximately 2002-2008. It is his assumption that the area is occupied based on past long-term occupation and quality of habitat (Inman 2020, personal communication). The wolverine analysis area and modeled wolverine habitat are displayed in Figure 14. Table 28 shows the amount of maternal, primary, and dispersal (female) habitat currently present in the action area for the Project. Note that maternal (denning) habitat overlaps primary and dispersal habitats, and that primary habitat overlaps dispersal habitat.

Table 28: Existing Maternal, Primary, and Dispersal (Female) Habitat in the Analysis Area.

Type of Wolverine Habitat (based on Inman et al. 2013)	Area (Acres)
Maternal (Denning)	6,921
Primary	29,930
Dispersal	75,041

Maternal and primary stands are primarily situated at higher elevations and have relatively low road densities when compared to dispersal habitat, which occupies lower elevation areas with higher levels of human access. Primary and maternal habitats support a wide range of potential wolverine prey, including small and medium-sized mammals, deer, elk, moose, bighorn sheep, and mountain goat.

Much of the action area is currently open to recreational activities, including snowmobiling, backcountry skiing, and other activities. Big game winter range and recommended wilderness are generally closed to winter motorized recreation activities. While dispersal habitat is displayed in Table 28, these areas generally are not suitable for the establishment of home ranges and reproduction (USDI 2013b). Dispersal habitat generally lies between primary and maternal habitat (which is restricted to higher elevations); it is used to move between patches of suitable high elevation habitat or for other exploratory movements.

Does the EA map big game winter range?

5.3.5.1 Disturbance

The wolverine is typically associated with vast, remote, undisturbed areas with limited human intrusion. Inman et al. (2013) reported in a study that includes parts of the CGNF, that wolverines tend to use higher elevations (>6,900 feet), steeper slopes (>16 degrees) and northerly aspects disproportionately to their availability. In a study of wolverines in northwest Montana, Hornocker and Hash (1981) found that large areas of mature forest and associated ecotonal habitats of open, rocky and alpine area accounted for the majority of wolverine locations. Wolverines are not tied to any specific vegetative or geologic habitat features – they use a variety of habitats, including those altered by management activities and fire and can persist in areas with dispersed or developed summer or winter recreation activities. Wolverine occurrence is strongly tied, but not limited, to the presence of deep, persistent snow (as modeled by Copeland et al. 2010, USDI 2013b) across their range, except for denning, which appears to have an obligate relationship

with the deep persistent snow zone. Den sites located in forested habitat have typically been associated with spruce (*Picea* spp) habitats. Magoun and Copeland (1998) reported that nearly all verified reproductive den sites have been found at higher elevations. Wolverines have large home ranges and food availability is probably the driving factor in determining home range size (as well as determining other biological parameters such as reproductive success and local persistence on the landscape). Wolverines have a high dispersal capability and seem to be able to move successfully through highly altered landscapes. Heinemeyer and others (2017) also found that wolverine respond to dispersed motorized and non-motorized recreation in the GYE by avoiding these activities to some degree.

The USFWS analyzed four categories of human disturbance as part of their rulemaking process (USDI 2013b). These included: (1) Dispersed recreational activities with primary impacts to wolverines through direct disturbance (*e.g.,* snowmobiling and heli-skiing); (2) disturbance associated with permanent infrastructure such as residential and commercial developments, mines, and campgrounds; (3) disturbance and mortality associated with transportation corridors; and (4) disturbance associated with land management activities such as forestry, or fire/fuels reduction activities. These were not found to be a threat to the wolverine DPS (Table 2), with the USFWS concluding:

> "Overall, human disturbances have likely resulted in some minor, but unquantified, loss of wolverine habitat, but wolverine have also been documented to persist and reproduce in areas with high human use and disturbance, including alpine ski areas and areas with high snowmobile use. It is possible that these forms of habitat alteration may affect individual wolverines, by causing the temporary movement of a few individuals within or outside of their home ranges during or shortly after construction. However, due to the small scale of the habitat alteration involved in these sorts of activities, we conclude that the overall impact of these activities is not significant to the conservation of the species. Dispersed recreation like snowmobiling and back country skiing, and warm season activities like backpacking and hunting, occur over larger scales; however, there is little evidence to suggest that these activities may affect wolverines significantly or have a significant effect on conservation of the DPS. Preliminary evidence suggests that wolverines can coexist amid high levels of dispersed motorized and nonmotorized use (Heinenmeyer *et al.* 2012, entire), possibly shifting activity to avoid the most heavily used areas within their home ranges.
>
> Transportation corridors and urban development in valley bottoms between patches of wolverine habitat may inhibit individual wolverines' movement between habitat patches; however, wolverines have made several long distance movements in the recent past that indicates they are able to navigate current landscapes as they search for new home ranges. As described above, we have no evidence to suggest that current levels of transportation infrastructure development or residential development are a threat to the DPS or will become one in the future.
>
> Land management activities (principally timber harvest, wildland firefighting, prescribed fire, and silviculture) can modify wolverine habitat, but this generalist species appears to be little affected by changes to the vegetative characteristics of its habitat. In addition, most wolverine habitat occurs at high elevations in rugged terrain that is not conducive to intensive forms of silviculture and timber harvest. Therefore, we anticipate that habitat modifications resulting from these types of land management activities would not significantly affect the conservation of the DPS, as we described above" (USDI Fish and Wildlife Service 2013b)."

FWS not worried about snowmo impacts on wolverines

The 2018 Species Status Assessment included similar conclusions based on a review of additional science since the 2013 proposed rule. Here the FWS noted: "*demographic risks to the species from either known or most likely potential stressors (i.e., effects from roads, disturbance due to winter recreational activities, effects of wildland fire, and overutilization) are low based on our evaluation of the best available information as it applies to current and potential future conditions for the wolverine and in the context of*

the attributes that affect its viability" (USDI Fish and Wildlife Service 2018). More recent scientific literature (Heinemeyer et al. 2019, and Kortello et al. 2019) supports the USDI Fish and Wildlife Service (2013b) findings that human disturbance in occupied habitat can affect wolverine habitat use, but not at the scale that would be a threat to the DPS. For instance, Heinemeyer et al. (2019) found that wolverine avoided areas of both motorized and non-motorized winter recreation and demonstrated that off-road recreation (backcountry skiing, snowmobiling) elicited a stronger response than road-based recreation with female wolverines exhibiting stronger avoidance of off-road motorized recreation than male wolverines (ibid). Kortello et al. (2019) observed a negative association with forestry road density and wolverine occurrence, particularly females, in the Canadian Rockies.

Science showing wolverines avoid off-road snowmo areas

5.3.5.2 Prey Distribution

Wolverines are not thought to be dependent on specific vegetation or habitat features that might be manipulated by land management activities, nor is there evidence to suggest that land management activities are a threat to the conservation of the species (USDI 2013b). Wolverines are considered habitat generalists in the summer, using a foraging strategy typical of opportunistic omnivores. Summer habitat use is influenced by food availability, temperature regulation, and breeding activities. Food is most available in spring and summer with a wider variety of potential food sources including carrion, small mammals, insects and insect larvae, eggs, and berries (Hornocker and Hash 1981 p. 1298). Elk, moose, and mule deer are the most abundant species in primary wolverine habitat in the summer and likely provide the most reliable sources of meat for wolverine that use the project area.

Wolverines remain active year-round, and, in winter, adapt their foraging strategy to that of scavenger. As scavengers, winter wolverine foraging habitat becomes more of an association with other species (i.e. food sources for wolverines are somewhat dictated by the distribution of big game species). Winter range for elk and moose occurs at lower elevations in the Basin and generally does not overlap modeled primary habitat. Winter-killed ungulates are, therefore, not likely to be a reliable source of prey for wolverine in the project area.

5.3.6 Environmental Consequences

5.3.6.1 Direct and Indirect Effects

5.3.6.1.1 Disturbance

5.3.6.1.1.1 Alternative 1 – No Action

Under the No Action Alternative there would be no activities in the project area, and there would be no disturbance to wolverine.

5.3.6.1.1.2 Proposed Action

Effects of the project on wolverine are expected to last from project initiation up to 15 to 20 years after project completion. While disturbance impacts would cease when implementation (mechanical vegetation treatment and temporary project route use, generally lasting up to four years) is complete, the distribution of prey may be affected over this longer time period. It would take approximately 15 to 20 years for regenerated stands to provide hiding cover for big game; a lesser amount of time would be required in stands experiencing intermediate treatments such as thinning.

Activities associated with implementation of the Proposed Action would include increased human presence and operation of heavy machinery in the project area. This could result in disturbance to wolverines, including interruptions in dispersal, foraging, and, to a much smaller degree, denning. When the Proposed Action, which contains more acres than would actually be treated (due to project sideboards related to regeneration harvest size and spacing, limits to treatment acres, etc.), is overlaid with wolverine habitat in the analysis area, there would be up to 922 acres of denning habitat and 5,394 acres of primary wolverine habitat affected by project activities. Approximately 17,391 acres of dispersal habitat would be affected if all acres/activities included in the current stand pool are implemented. Potential impacts to wolverine habitat are displayed in Figure 15. As winter harvest would not occur, there would be no disturbance of wolverine that may be present in the area during the winter. During implementation, it is expected that wolverine that may be present would alter their patterns and use nearby undisturbed habitats while disturbance occurs.

Mechanical equipment use would temporarily increase human disturbance in the action area through noise associated with machinery, increased traffic, and increased human presence. This could result in temporary disturbance to wolverines, including interruptions to dispersal, foraging, and other activities. Mechanical treatment activities may include use of the existing road system, construction and use of temporary project routes, decommissioning of temporary project routes, motorized access changes (including decommissioning of existing system roads), vegetative treatment (including fuels treatment and burning), and other human activity in excess of background levels (e.g. hand pre-commercial thinning). These activities were determined to not be a threat to the species (USDI 2013b and USDI 2018). Table 29 displays the expected impacts of the proposed action in the action area by habitat type and treatment type.

Table 29: Acres of Wolverine Habitat affected by the South Plateau Project by Treatment and Habitat Type.

Type of Wolverine Habitat	Regeneration	Commercial Thin	Fuels Treatment	Aspen Restoration	Burning	Non-commercial thin	All Treatments	Habitat Affected as % of Total Habitat Type
Maternal	576	273	48	0	26	0	922	13%
Primary	3,144	1,531	362	0	87	272	5,394	18%
Dispersal	8,776	5,608	866	147	458	1,536	17,391	23%

Use of the existing road system and construction, use, and decommissioning of temporary project roads (to be completed prior to contract close-out) to implement the proposed activities would result in additional disturbance above background levels in the action area. Winter harvest would not occur under this project, so winter disturbance (associated with implementation) would be minimized in primary and maternal habitat. This would be consistent with recommendations provided by Kortello and others (2019) to reduce mechanized use of roads (including disturbance associated with harvest) in the winter. Up to 22.2 miles and 4.1 miles of temporary project routes would be constructed (and subsequently decommissioned) in wolverine primary and maternal habitat, respectively. Burning of piles and or accumulations of slash in proposed treatment units would contribute additional disturbance in the action area during implementation. As activity fuel loading would determine the need for piling of slash and/or jackpot burning in units, the actual number of acres affected would not be known until after implementation of vegetative treatments. This activity would have variable impacts on vegetation; where

more contiguous, burning would stimulate growth of understory grasses and forbs. Disturbance associated with harvest-related traffic on roads could result in temporary interruptions to wolverine dispersal, foraging, and other activities. Wolverine may temporarily avoid treatment areas while implementation and human disturbance are occurring. Permanent access changes may also disturb wolverine. Short term disturbance may occur during road decommissioning. Long term disturbance would increase where closed (administrative) roads are opened to the public to maintain access to connections on the Caribou-Targhee National Forest. Overall, 8.2 fewer miles of road would be available for motorized use following implementation of access changes, so there would be a net reduction in disturbance.

The best scientific and commercial information available indicates that only the projected decrease and fragmentation of wolverine habitat or range due to future climate change is a threat to the continued existence of the species. Current information does not indicate that other potential stressors such as land management activities such as those proposed under the South Plateau Project (or other activities such as recreation, infrastructure development, and transportation corridors) pose a threat to the DPS (USDI 2013b). Land management activities (principally timber harvest, wildland firefighting, prescribed fire, and silviculture) can modify wolverine habitat; however, the wolverine is a generalist species that appears to be little affected by changes to the vegetative characteristics of its habitat (USDI 2013b). The USFWS five factor analyses (USDI Fish and Wildlife Service 2013b) indicates that disturbance associated with land management activities like those proposed under the South Plateau Project are not a primary or secondary threat to the wolverine DPS.

While dispersal activities could be affected to some degree, these habitats are not suitable for the establishment of home ranges and reproduction and are generally not for used for foraging (USDI 2013b). Dispersal between populations is needed to maintain genetic diversity. Any disruption of dispersal or other exploratory movements would be temporary and would occur at a relatively small scale (generally within a portion of the project area at any point in time) when compared to the large home range size of wolverines. Wolverine have been documented to persist and reproduce in areas with high levels of human use and disturbance including developed alpine ski areas and areas with motorized use of snowmobiles (Heinenmeyer et al. 2012, USDI 2013b, and Heinemeyer et al. 2019). This suggests that wolverine are able to adjust their use within their home ranges to avoid disturbance (Heinemeyer et al. 2012).

5.3.6.1.2 Prey Distribution

5.3.6.1.2.1 Alternative 1 – No Action

Alternative 1 would have no direct effects on prey distribution. Indirectly, losses of cover resulting from ongoing susceptibility of tree species to insect and/or disease outbreak and fire could result in short-term reductions in cover. Fire and insect and disease events in the project area would contribute to overall landscape diversity in the long-term, which could enhance prey species diversity for wolverine.

5.3.6.1.2.2 Proposed Action

Human disturbance in the action area associated with machinery noise, increased traffic, and increased human presence (including mechanical treatment activities, use of the existing road system, construction and use of temporary project routes, decommissioning of temporary project routes, and fuels treatment and burning) is expected to affect prey distribution. Big game are likely to avoid areas where implementation is actively occurring, reducing potential foraging opportunities for wolverine in the short-term in affected primary and maternal habitat. While the distribution of potential prey may temporarily change, these movements would be relatively short in distance. It is unlikely that available prey resources would change appreciably at the scale of a wolverine home range. At the Elk Analysis Unit scale there

would be a temporary 8.3% reduction in security areas for elk. Security areas would also be reduced approximately 0.5% permanently through road access changes described in the grizzly bear section. Although security areas would be reduced, there would be a reduction in the mileage of road available for motorized use by the public and for administrative purposes. Hiding cover would also be reduced from the existing level of 95.3% to 78.2%. These figures assume that all proposed activities are implemented and occur at the same time. Given the relatively limited infrastructure for implementing the proposed activities and project sideboards, design features, and other factors, it is expected that the actual impact to big game would be less as proposed treatment units are pared down and activities phased in order to comply with Forest Plan and other requirements. In the long-term, treatments are expected to improve summer and winter habitat for elk and mule deer by increasing the presence of understory species such as grasses and forbs and enhancing aspen stands. Regeneration harvest, commercial thinning, precommercial thinning, aspen enhancement, fuels treatment, burning, and associated weeds treatments would improve foraging conditions for big game. Improvements in forage conditions may improve the health of big game herds, which would aid in maintaining a sustainable prey base for wolverine.

Because wolverine operate at a large scale (averaging a minimum of 128 mi^2) in the South Plateau project area, they would be able to adjust to temporary changes in big game distribution. There would be no effect on potential prey (carrion) population levels under this project. Security areas, areas with high habitat effectiveness, hiding cover, and foraging habitat would be distributed across the elk analysis area, and would contribute to big game population management goals of the state of Montana. As such, effects would be minor at the scale of the analysis area and the population level under the South Plateau Project. Disturbance to prey resources is not considered a potential threat to the wolverine in the 2013 proposed listing rule (USDI 2013b).

5.3.6.2 Cumulative Effects

5.3.6.2.1 Disturbance

Past activities, actions, and events have been incorporated into the assessment of the affected environment (existing condition) for this project. Ongoing activities in the analysis area include residential development and occupancy, firewood gathering, recreational activities (summer and winter), and commercial activities (horseback rides, guiding, seasonal operations at the West Yellowstone Airport). Ongoing activities also include State Highway (Montana Department of Transportation) projects along Highway 191. These activities would generally occur at lower elevations (where the vast majority of private lands is present) outside of primary and maternal habitat; in addition, a portion of these activities are outside modeled dispersal habitat. Because wolverine rely on more remote areas at higher elevations for denning and foraging, the only human activities occurring in these areas generally include a variety of recreational pursuits. In the summer, primary wolverine habitat is used for mountain biking, hiking, horseback riding, and motorized use on established trails. In the winter, primary wolverine habitat is open to snowmobile use on groomed trails, backcountry snowmobile use, and backcountry skiing. A number of groomed snowmobile routes are present in the Project Area during the winter. Effects of winter recreation on wolverine aren't entirely clear, but this is the subject of some current research efforts. Heinemeyer and others (2017) found that wolverine respond to dispersed motorized and non-motorized recreation in the GYE by avoiding these activities to some degree. Activities in dispersal habitat in the analysis area include the full spectrum of human influences, including development around the town of West Yellowstone, state and county roads, subdivisions/residential development, commercial activity, and recreation. Those activities that occur in dispersal, primary, and maternal habitat have the potential to disturb wolverine that are passing between suitable habitat patches or that are resident in primary and maternal habitat (the areas generally selected for home range establishment, foraging, and reproduction). As these activities are occurring and are expected to continue in the future, it is unlikely that wolverine

Wolverines show some avoidance of snowmo areas

would avoid these areas to a greater degree than what may be currently occurring. None of these activities are considered a primary or secondary threat to the wolverine DPS (USDI 2013b).

Reasonably foreseeable future activities include all ongoing activities as well as proposed improvements at the West Yellowstone Airport and implementation of the Yellowstone Shortline Trail and North Hebgen Multiple Resource Project. Airport improvement activities would include terminal reconstruction and improvements, utility improvements, and other activities. The North Hebgen Project is scheduled to occur within a portion of the analysis area for wolverine in the future. Because the portion of this project that lies within the analysis area for the South Plateau Project is located at lower elevations along the Madison Arm of Hebgen Lake and the immediate vicinity, the effects of the North Hebgen Project on wolverine are expected to be minor. While it is possible a wolverine may use scattered dispersal habitat available in this area during the summer, it is unlikely given the level of disturbance (Highway 191, multiple snowmobile routes and summer open roads, etc.) present in the area.

The area is already so impacted, wolverine use is unlikely

There is no evidence that human development, infrastructure development, and associated activities are preventing wolverine movements between suitable habitat patches (USDI 2013b). When these effects are combined with the temporary and permanent impacts of the South Plateau Project, there would be no adverse cumulative impact on wolverine.

Implementation of the Proposed Action could displace wolverine. This disturbance would combine with disturbance associated with winter and summer recreation in the area, as well as the low level of disturbance associated with the North Hebgen Project and West Yellowstone Airport Projects to affect wolverine to some degree. Given the fact that winter harvest would not occur, and that project activities are relatively small-scale in relation to the large wolverine home range size, this cumulative impact would not adversely affect the wolverine DPS.

Does not acknowledge impacts of increased recreation.

5.3.6.2.2 Prey Distribution

Prey species could temporarily be displaced from the North Hebgen and Yellowstone Shortline Trail Projects and the South Plateau Project treatment units, if implementation of projects overlap. Foraging habitat is abundant and widely available in the vicinity of these projects, so prey species would be able to adjust their movements to areas with less disturbance and suitable forage opportunities. Wolverines would adjust their foraging patterns to meet energy requirements while temporary impacts are occurring. In the long-term improved forage in both project areas could enhance conditions for prey species across the analysis area, which would result in a long-term benefit for wolverines.

5.3.7 Consistency with FP direction specific to wolverine

One guideline in the 2022 Custer Gallatin Forest Plan addresses wolverine. Guideline FW-GDL-WLWV-01 states: *To provide secure habitat for reproductive wolverines, there should be no increase in special use authorizations or designation of winter routes in maternal habitat for wolverines during the reproductive denning season.* As this project is not a special use authorization and does not affect designation/length of winter routes in maternal habitat, it would not be applicable to this project.

5.3.8 Summary and Conclusion

The Proposed Action may displace wolverine from the project area through disturbance of both individual wolverines and their prey (outside of the winter). Most of the project area provides dispersal habitat, and dispersal habitat is widespread and abundant across the analysis area, so wolverine would be able to alter their travel routes into adjacent areas in order to avoid project activities.Effects (disturbance and prey/prey distribution) would be temporary. Long-term forage benefits for prey species could benefit wolverine. As the proposed actions are not a primary or secondary threat to the wolverine, wolverine are

capable of and would cope with disturbance associated with treatment activities, and no barriers to wolverine movement/dispersal would result, I have determined that the South Plateau Project is *not likely to jeopardize the continued existence* of the wolverine. In the context of the analysis area and the larger landscape/region, the disturbance effects of this project would be relatively minor, and restricted to the short term.in the long term there would be an overall reduction in routes open to motorized use, which would reduce disturbance, and would increase heterogeneity that may improve habitat for potential prey/carrion. While disturbance would occur, it would be temporary and spread over a number of years. As wolverine are generalists, changes in vegetation in modelled maternal, primary, and dispersal habitat would not alter their suitability for this species. Wolverine habitat in the project area is not unique; while a portion of the project area is adjacent to Yellowstone National Park, it is otherwise indistinguishable from other modeled wolverine habitat on the District and Forest. For these reasons, it is not expected that the project would have a significant impact on this species.

6 Species of Conservation Concern

The Record of Decision for the Land Management Plan for the Custer Gallatin National Forest was signed in January 2022. It was created using the 2012 Planning Rule. The 2012 Planning Rule requires the development of coarse-filter plan components and fine-filter plan components (where necessary) to provide the conditions necessary to maintain viable populations of Species of Conservation Concern within the plan area, or to contribute to maintaining a viable population of a Species of Conservation Concern across its range where outside the Agency's authority or beyond the inherent ecological capability of the plan area. Species of Conservation Concern are those plant and animal species that are known to occur in the plan area that the Regional Forester has, through the use of the best available scientific information, identified a substantial concern about the species' capability to persist over the long term in the plan area. Under the previous Planning Rule (1982) Sensitive Species were those plant and animal species for which population viability was a concern; these species were identified by the Regional Forester. Species of Conservation Concern are thus similar to Regional Forester's Sensitive Species. Under the 2012 Planning Rule there is no requirement for the designation of Regional Forester's Sensitive Species (RFSS). As a result, there is no longer analysis of RFSS in this document, although some former RFSS may be considered elsewhere.

The Regional Forester identified two terrestrial wildlife species on the Custer Gallatin National Forest as Species of Conservation Concern (Marten 2021). The rationale for including these species as SCC but not others is provided in this letter (Marten 2021) as well as the Custer Gallatin SCC rationale document (USDA 2021). The SCC for the Custer Gallatin National Forest are the greater sage grouse and the white-tailed prairie dog. Neither of these species is present in the vicinity of the proposed South Plateau Project and potential habitat is also not present. As a result, there would be No Impact on these species and there will be no further analysis of effects for these SCC in this document.

7 Other Species of Interest With No Special Designation

Other species of interest include species or groups of species that do not have special designations under ESA (Threatened, Endangered, Proposed, or Candidate) or the Forest Plan (Species of Conservation Concern), and are not analyzed as Noetropical Migratory Birds. These species or groups include those for which law, regulation, or policy dictate consideration of potential project impacts. For this project there

are two species of interest: Bald eagle and Big Game (elk, moose, and deer). The Bald and Golden Eagle Protection Act provides for the protection of eagles and specifically prohibits the “take” of eagles. This species will be analyzed in order to show compliance of the proposed activities with the Act. The second species of interest is Big Game. The Custer Gallatin Forest Plan (USDA 2022) has specific Desired Conditions, Goals, and Guidelines for Big Game. One of the goals in the Forest Plan calls for cooperation and collaboration with State wildlife management agencies (Montana Fish Wildlife & Parks - FWP) in the development of management strategies and project activities to maintain suitable habitat conditions and big game numbers and distribution that allow for sustainable, high quality hunting experiences on National Forest System lands. Under the Plan collaboration between the Forest Service and FWP must occur to determine whether key big game habitats (e.g. hiding cover, thermal regulation and snow interception, winter range, security, etc.) are functional/limited under the existing condition as well as under management (project proposal) scenarios. This necessitates some level of analysis of these key habitat features; the analysis of these features follows.

7.1 Bald Eagle

7.1.1 Issue

Under the previous Forest Plan (amended 2015, USDA 2015), the bald eagle was a management indicator species (MIS) for the Gallatin National Forest. Under the new 2022 Custer Gallatin Forest Plan (USDA 2022), there is no longer a “MIS” designation. In addition, the bald eagle is no longer considered a sensitive species, as the new planning rule also does not require the designation of Regional Forester’s Sensitive Species. Bald eagle are provided protection under the Bald and Golden Eagle Protection Act. The Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668c), enacted in 1940, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." And “disturb” as: “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

Bald eagles may be affected by a variety of human activities, including timber harvest, that cause disturbance or alter habitat. Responses to such activities can range from abandonment of nest sites and/or territories to temporary avoidance of human activities. There are no known nests in or near the project area, so impacts to existing nest sites will not be considered in this analysis. The project is entirely outside the estimated home ranges of all known bald eagle nests. Wintering bald eagles have been noted in the vicinity of the lower South Fork Madison River during seasonal surveys. The project is not expected to have any effects on food sources that may be present in the South Fork Madison River. Potential perches may be affected adjacent to the South Fork Madison River. The project also has the potential to affect perching habitat through alterations in current availability and ongoing recruitment of suitable trees.

7.1.2 Resource Indicators and Measures

The project has the potential to affect foraging eagles in the late fall and spring. Table 30 shows this issue and the indicators and measures used to assess the issue. Timber harvest, snow plowing, and hauling would not be allowed in the area between November 1 and April 30 in order to reduce or eliminate impacts to winter recreation, including snowmobiling, skiing, dog-sledding, etc. In addition, no vegetative treatment would be allowed in big game winter range between December 1 and April 30 to reduce potential disturbance on these species. Potential perching habitat adjacent to the South Fork Madison River may also be affected. The resource indicators used for this analysis were based on these potential effects and consisted of consideration of how proposed activities could affect foraging through disturbance and effects on perches and perch recruitment in winter habitat. There are no established thresholds for these indicators that the Forest uses as a target level for which to manage, and the FP does not contain any quantitative standards specific to these indicators. The conclusion of how changes in these indicators would affect bald eagle was, therefore, qualitative in nature. The Forest Plan provides one guideline (FW-GDL-WL-06) related to raptor nesting and disturbance: "To allow for successful reproduction, management activities should avoid disturbance at known active raptor nests and fledging areas during the reproductive season."

Table 30: Resource indicators and measures for assessing effects on bald eagles

Issue	Resource Indicator	Measure- No Action	Measure- Proposed Action	Used to address: P/N, or key issue?	Source
Project has the potential to affect foraging behavior through disturbance	Amount of disturbance within 0.25 miles of the South Fork Madison River during period when eagles may be present	• No effect	• Approximately 601 acres in the current stand pool occur within .25 miles of the South Fork Madison River during period when eagles may be present	No	Montana Bald Eagle Management Guidelines (Montana Bald Eagle Working Group 2010)
Project has the potential to affect perching habitat used during the winter and early spring	Amount of vegetative treatment within 0.25 miles of the South Fork Madison River with a potential to affect potential roost structure	• Ongoing fire suppression → neutral • Insect and/or disease → reduction	• Approximately 482 acres affected with Rx that may affect overstory vegetation or snags within 0.25 miles of that portion of the South Fork that may be used by bald eagle • Reduction in risk of loss of future perching habitat due to reduced risk of wildfire and/or insect and/or disease	No	Montana Bald Eagle Management Guidelines (Montana Bald Eagle Working Group 2010)

7.1.3 Methodology and Information Sources

7.1.3.1 Spatial and Temporal Context for Analysis

The Montana Bald Eagle Management Guidelines (Montana Bald Eagle Working Group 2010) recommend that a 0.5-mile radius distance buffer be established around bald eagle nest sites where forest management activities such as thinning and/or removal of forest vegetation are planned. The distance buffer is recommended to be in place from 1 February to 15 August. As there are no known nests in the project area, a 0.25 mile buffer adjacent to potential foraging habitat along the South Fork Madison River will serve as the analysis area for assessing potential disturbance impacts that may occur in the late fall and early spring. As activities would generally not occur until after April 30 due to conflicts with winter recreation and biug game winter range, this leaves a short period when disturbance may occur.

The temporal period considered for the effects analysis is from the project initiation to project completion, as effects considered in this analysis would stem from potential disturbance from project activities, which would cease upon completion of the project.

7.1.3.2 Methods Used for Analysis

7.1.3.2.1 Disturbance

Effects on foraging activities of bald eagles through disturbance were analyzed by considering the amount of disturbance that would be expected to occur within 0.25 miles of potential foraging habitat (South Fork Madison River) during the time of year at which they may be present, which is generally between 1 November and 15 April.

7.1.3.2.2 Habitat

Effects of the project on current and future availability of perch trees were considered, based on the effects of treatments on forested stands described in the Forest Vegetation Specialist's Report (Demastus 2022).

7.1.4 Affected Environment

7.1.4.1 Existing Condition

The Hebgen Lake Ranger District supports a relatively robust population of bald eagles. All known nests are in close proximity to Hebgen and Earthquake Lakes. There are no known nests in the vicinity of the project area; the closest nest is located approximately 4 miles north of the nearest proposed treatment unit along the lake shore. The *Bald Eagle Management Plan for the Greater Yellowstone Ecosystem* (Greater Yellowstone Bald Eagle Working Group 1996, pp. 22-24) states that in the absence of long term monitoring data to indicate otherwise, the home range around a bald eagle nest should include all foraging habitat within 2.5 miles of a nest. As the project area is greater than 2.5 miles from the nearest nest, the project is entirely outside of known bald eagle home ranges. Bald eagle foraging has been documented along the South Fork Madison River in the winter, likely due to the availability of open water in a portion of the river during this time. Bald eagles in the general area of Hebgen Lake begin their nesting and courtship activities starting in approximately February and March. Foraging in the South Fork Madison becomes less likely during this time, as bald eagle pairs use the area around existing nests to a much greater degree than areas that are more distant.

7.1.4.1.1 Disturbance

Any activity that disrupts breeding, feeding, sheltering, and roosting behavior and causes, or is likely to cause, nest abandonment or reduced productivity, is considered disturbance and is a violation of the BGEPA and state regulations (Montana Bald Eagle Working Group 2010 pg. 4). Disturbance can occur when the source is unusually loud or when it breaks from the normal pattern of activities within the vicinity of the nest (Montana Bald Eagle Working Group 2010 pg. 4). Responses of eagles may range from abandonment of nest sites to temporary avoidance of human activities. Responses may also vary depending on type, intensity, duration, timing, predictability and location of human activities. Individual pairs may respond differently to human disturbances because some bald eagles are more tolerant than others (Montana Bald Eagle Working Group 2010). Generally, eagles are most sensitive to human activities during the nest building, egg laying, and incubation period, which is normally from 1 February to 31 May.

As there are no known nests in the vicinity, the potential for disturbance only exists where winter foraging habitat is present. This includes approximately 5.75 miles of the South Fork Madison River that is situated south of US Highway 20. A groomed snowmobile route is present along (generally 0.1-0.25 miles away) approximately 3.2 miles of the South Fork Madison River; no motorized winter disturbance is allowed along the remainder of the South Fork that provides winter foraging habitat opportunities.

7.1.4.1.2 Habitat

Perching habitat could be altered by the proposed treatments. Bald eagles tend to use larger trees or snags adjacent to open water as perch sites in the winter. Suitable perch trees are available along the South Fork Madison River corridor.

7.1.5 Environmental Consequences

7.1.5.1 Direct and Indirect Effects

7.1.5.1.1 Disturbance

7.1.5.1.1.1 Alternative 1 – No Action

Under the No Action Alternative, no project activities would take place and there would be no direct or indirect effects on foraging bald eagles from disturbance.

7.1.5.1.1.2 Proposed Action

Proposed activities have the potential to affect bald eagle foraging during a very narrow period of time. Due to multiple resource concerns associated with recreational use, primarily along groomed snowmobile trails in the winter, there would be no timber harvest, snow plowing, and/or hauling between approximately November 1 and April 30. Other implementation activities (small diameter thinning, fuels treatment, etc.) that do not involve these activities may occur during this time period. Implementation of all vegetative treatments in big game winter range would also be restricted from December 1 through April 30. Activities occurring shortly before this date (as Hebgen and Quake lakes are generally ice free till early November and provide high-quality foraging habitat) or after this date (nesting bald eagles generally use the area around nests to a much greater degree after approximately March 1) have the potential to affect foraging eagles. Overall, there are approximately 601 acres of proposed treatment within ¼ mile of the South Fork of the Madison River. Approximately 580 acres (217 acres thinning, 119

acres precommercial thinning, 107 acres clearcut, 79 acres fuels treatment, and 58 acres aspen restoration) could occur during the period when eagles may be foraging along the South Fork. While 21 acres of burning is also situated within 0.25 miles of the river, this activity would not occur when eagles are in the vicinity due to moisture and other environmental factors. Monitoring of winter use along the South Fork (from Stoddard Point where it meets the Madison Arm to a point approximately 3 miles above the bridge over the 478 Road) has noted from zero to two bald eagles along the entire length of the survey over the last five years that surveys have occurred. Because the highest quality winter foraging habitat is situated adjacent to large bodies of open water where prey and carrion may be present (Madison Arm of Hebgen Lake, the Lower South Fork, Madison River above Hebgen Lake, and the Madison River below Hebgen Lake), it is unlikely that bald eagles foraging along the South Fork would be affected appreciably. Should a bald eagle be foraging in the vicinity of the South Fork during the period when implementation may be occurring, they may respond to the noise and sight of increased activity (log trucks, machinery, etc.) by moving to adjacent areas where no activities are occurring. These movements are expected to be short in distance and duration. Once these activities cease, bald eagles would use the area in a similar fashion as occurred pre-implementation.

In the unlikely event that a bald eagle nest is discovered in the project area, all recommendations regarding protection of bald eagle nests described in the Montana Bald Eagle Management Guideline document (Montana Bald Eagle Working Group 2010) would be implemented.

7.1.5.1.2 Habitat

7.1.5.1.2.1 Alternative 1 – No Action

Ongoing fire suppression would, in general, have a positive effect on nesting habitat. Current roosting habitat would be maintained on the landscape and aging and/or decadent trees would be replaced by recruitment of additional roost trees adjacent to or within direct sight of the river. .

Continued susceptibility and mortality from insects and disease in the forested communities across the analysis area would have a positive effect on bald eagle roosting habitat by creating new standing dead structure adjacent to the river.

7.1.5.1.2.2 Proposed Action

Project activities could alter bald eagle habitat through changes in forest structure. Under all proposed treatment activities, the Forest Plan snag standard (where existing snags are available) and live (green) snag replacement tree standard would be met. Design features would be implemented such that the largest and most complex snags available would be retained. In addition, all snags >20 inches DBH would be retained unless they pose a safety risk. By meeting these standards and implementing the design features related to snags, potential perches would be retained for bald eagle. Perches immediately adjacent to the South Fork Madison River and all snags within the riparian area would be retained through design features designed to protect the function and structure of the riparian and provide for future wood inputs to the stream. Vegetation management would only occur in the inner riparian management zone if the purpose of the treatment is to restore or enhance the ecological integrity of aquatic and riparian-associated resources. Clear-cut harvest would generally not occur in the riparian management zone. If treatment occurs in the riparian zone, structures likely to create large woody debris inputs to the stream would be retained. While perches may be affected to some degree, it is expected that potential perches would be available following implementation and would be in sufficient numbers and quality (size, complexity, etc.) to support bald eagles that may use the area immediately adjacent to the South Fork for winter foraging.

Of the 601 acres of potential treatment identified within 0.25 miles of the South Fork, there would be 482 acres of activity (217 thinning, 107 clearcut, 79 acres fuels treatment, 58 aspen restoration, and 21 burning) that have the potential to affect existing and potential snags and overstory trees that may be used for perching.

7.1.5.2 Cumulative Effects

7.1.5.2.1 Disturbance

Past, present, and future activities with a potential to disturb winter foraging are few. Bald eagles that may use the South Fork (and much of the Hebgen Lake Ranger District adjacent to Hebgen Lake) are likely habituated to the sounds and sights of snowmobiles during the winter. There are a numberof past, present, and reasonably foreseeable future actions that have caused and may continue to cause disturbance to foraging bald eagles that may be present. These include use of roads and trails, activity on private lands (including residential developments), and outfitter and guide activity (snowmobile guiding and special events). Given all of the activities that take place and will continue to take place within the area south of US Highway 20 in winter foraging habitat, bald eagles using the analysis area in the winter are likely tolerant of existing levels of human disturbance in the area. A groomed snowmobile route is present adjacent (within 0.1 to 0.25 miles) of a portion of the South Fork Madison River. There is generally visual screening between the trail and the River. In addition, the West Yellowstone to Reas Pass Rail to Trail Project would be implemented in the future. This project would create a multi-use non-motorized trail along the route of the abandoned Oregon Short Line rail bed beteen West Yellowstone and Reas Pass. The trail would be a summer trail and all construction activities would occur during the summer season (no winter activities or plowing), so the potential to disturb foraging bald eagles along the South Fork is very small.

Again, wildlife must be used to snowmo use by now.

When combined with the potential impacts of the proposed action, there would be a cumulative impact on disturbance in the vicinity of the South Fork Madison River. Treatment activities would affect screening vegetation that lies between the river and a groomed snowmobile route. Snowmobiles may be more visible from the South Fork as a result. Given the fact that bald eagles that use the area are likely habituated or tolerant to snowmobile activity and the fact that the portion of the South Fork south of US Highway 20 is used sporadically (in favor of other high quality open water habitat in the Basin), the cumulative impact is expected to be minor.

Only minor snowmo impacts

7.1.5.2.2 Habitat

Habitat quality in winter foraging habitat has been and will continue to be affected by personal use wood cutting, danger tree felling, and activities on private lands. Personal use woodcutting is not allowed in areas immediately adjacent to streams where likely perches are present. The proposed project, when combined with the effects of past, present, and reasonably foreseeable future activities would potentially have a cumulative impact on potential perches, particularly in areas further from the South Fork but that provide a view of the floodplain. Design features and Forest Plan standards would ensure that snags and snag replacement trees would be available for eagles and other species that use dead wood for nesting, perching, and foraging. Reduction of mountain pine beetle risk and the risk of high-severity fire in close proximity to private land and other values at risk is expected to maintain overstory structure in the long term, and may promote increased growth in residual trees following implementation. Consistency with direction specific to bald eagle

Table 31 lists the Forest Plan standards that are applicable to bald eagle habitat management and how the Proposed Action would be in compliance with those standards.

Table 31: FP standards specific to bald eagle habitat management and how the project complies with those standards

Standard	Compliance
FW-GDL-WL-06 To allow for successful reproduction, management activities should avoid disturbance at known active raptor nests and fledging areas during the reproductive season.	There are no known nests in the analysis area so this standard would not be applicable. If a nest were to be discovered in this area or anywhere in the analysis area it would be protected using the best available information and recommendations (Montana Bald Eagle Working Group 2010) to meet this guideline.

7.1.6 Summary and Conclusion

Design features related to snags and riparian habitat, and restrictions on plowing/winter activities and treatment in big game winter range during the winter would minimize potential impacts on foraging eagles and winter habitat. Implementation would generally occur when eagles are elsewhere in the basin (associated with higher quality foraging habitat or existing home ranges around nest sites) and would retain adequate perches (snags and green trees) for foraging. In the context of the analysis area and the larger landscape/region, the disturbance effects of this project would be minor given the fact that eagles are potentially active in the affected area for a short period of time during the non-nesting season. The project would be in compliance with the Bald and Golden Eagle Protection Act. In the long term there may be a reduction in potential roosts adjacent to the South Fork in treated stands, but these features would continue to be available. Foraging habitat in the project area is not unique; higher quality winter foraging habitat is present in the Basin. As the expected impacts to foraging habitat would be quite small, this project would not significantly impact this species.

7.2 Big Game

7.2.1 Issue

Big game are not listed under the 2022 Forest Plan as a special status species; however, the Plan does require some level of analysis to determine potential effects to this group and facilitate collaboration with Montana Fish Wildlife & Parks. Proposed activities have the potential to affect Big Game through changes in forage, cover, and the distribution of Big Game across the landscape.

7.2.2 Resource Indicators and Measures

The Proposed Action has the potential to alter Big Game habitat by changing the distribution and abundance of cover and other forested vegetation (which also provides for thermoregulation and snow interception on winter ranges) and understory vegetation (forage), affecting riparian areas, and altering the distribution and vigor of aspen stands. The Proposed Action also has the potential to affect Big Game distribution through disturbance and displacement.

Elk distribution in particular is influenced by motorized routes and route density. Motorized routes are used to calculate one of the measures used as an indicator in this analysis: elk security. Elk are particularly vulnerable during hunting season, and their distribution during this time of year is largely dependent upon the availability of elk security areas. In this analysis, elk security areas were defined as those areas that are at least 0.5 miles from an open motorized route or project road and at least 250 acres in size. The project has the potential to affect elk distribution during hunting season by temporarily altering and/or reducing the amount of security areas available to elk during project implementation. Elk distribution is also influenced by the amount of hiding cover on the landscape. Hiding cover is defined by the 2015 Amended Forest Plan (USDA 2015), the 2013 Collaborative Recommendations document

(USDA & FWP 2013), and the Elk Analysis Framework (USDA 2013b) as "vegetation capable of concealing 90% of a standing adult big game animal from the view of a human at a distance equal to or less than 200 feet; generally any vegetation used by big game for security or escape from danger.". Based on field studies in habitats similar to those in the project area (Canfield 2011), spring/summer/fall hiding cover is provided by tree species or species mixes that are naturally capable of having relatively dense (≥40%) canopy cover.

Winter range for moose within the project area includes lodgepole pine stands and other mixed conifer stands (with varying amounts of subalpine fir in the understory) and riparian willow communities. The proposed treatments in these habitat types have the potential to affect habitat quality for moose by impacting understory vegetation (primarily subalpine fir and lodgepole pine) that is preferred browse for moose. The treatments could also result in a more open forest canopy with less snow interception in winter habitat. Implementation of the proposed treatments will involve the use of heavy equipment and increased human presence, which could displace moose from preferred habitat.

The indicators for impacts to elk will be hiding cover and security areas. There are no established thresholds for elk security or hiding cover that the Forest uses as a target level for which to manage, and the Forest Plan (USDA 2022) does not contain any quantitative standards specific to these indicators. The indicator of impacts to moose will be the amount of cover (i.e. acres of winter forage) in moose winter range impacted by proposed treatments. The Forest Plan also does not provide quantitative standards specific to this indicator. The conclusion of how changes in these indicators would affect elk and moose was, therefore, qualitative in nature. The Forest Plan does include guidelines for maintaining the functionality of key big game habitats (including hiding cover; FW-GDL-WLBG-01), avoiding activities that would stress big game in winter range during the winter (FW-GDL-WLBG-02), and avoiding reductions in security habitat during hunting season when it is determined that secure habitat is limited (FW-GDL-WLBG-03) that will be considered under this analysis.

Table 32: Resource indicators and measures for assessing effects on big game.

Issue	Resource Indicator	Measure- No Action	Measure- Proposed Action	Used to address: P/N, or key issue?	Source
Proposed activities can affect foraging habitat	Effect on forest understory vegetation	Ongoing fire suppression leads to reduction. Insect/disease increase leads to increase.	Understory forest vegetation stimulated on up to 19,700 acres.	No	USDA Forest Service and Montana Department of Fish, Wildlife, and Parks (2013)
Proposed activities can affect foraging habitat	Effect on riparian areas	Ongoing fire suppression leads to reduction. Insect/disease increase leads to improvement.	Integrity of these areas would be maintained through the application of project design features.	No	Review of effects of similar activities from pertinent scientific literature
Proposed activities can affect foraging habitat	Effect on aspen	Ongoing fire suppression leads to reduction. Insect/disease increase leads to enhancement.	Up to 162 acres enhanced.	No	Review of effects of similar activities from pertinent scientific literature
Proposed activities can affect foraging habitat	Effect on moose winter range (cover)	No direct effect Ongoing fire suppression leads to increase in dense cover but a decrease in accessible understory forage Insect/disease outbreak leads to potential loss of cover; regeneration of understory would improve forage	A total of 5,814 acres of winter range cover affected in the analysis area when all proposed treatment units are considered. Moose-specific design feature as well as project sideboards and design features would reduce this impact.	No – Design Feature created in response to Montana FW&P comments during collaboration	Review of effects of similar activities from pertinent scientific literature and discussions with Montana FW&P

7.2.3 Methodology and Information Sources

7.2.3.1 Spatial and Temporal Context for Effects Analysis

A recent collaborative elk recommendations publication (USDA Forest Service and Montana Department of Fish, Wildlife, and Parks 2013) made recommendations regarding the spatial scale of analyses related to elk. The collaborative elk recommendations document (USDA & FWP 2013) recommends that for project-level analyses the appropriate scale of analysis is the Elk Analysis Unit (EAU). An EAU represents the best approximation of a herd unit home range and is based on local knowledge of State and Federal biologists for an area. EAUs were delineated in 2013 in cooperation with Montana Department of Fish, Wildlife and Parks (MFWP) for the Hebgen Lake Ranger District.

Based on the recommendations made in the collaborative recommendations document (USDA & FWP 2013), the Forest Service produced a document entitled *The Custer, Gallatin, Helena, and Lewis and Clark National Forests - Framework for Project-Level Effects Analysis on Elk* (USDA 2013b). This is a non-prescriptive document that provides a menu of analytical methods to assess the potential effects of Forest Service project activities on elk habitat (applicable only to the Custer, Gallatin, Helena, and Lewis and Clark National Forests). This document recommends that for analyses of security and forage the appropriate scale of analysis is the Elk Analysis Unit (EAU). This document also recommends considering forage at the context of the larger Forest landscape as well. For this project, the EAU scale will be the analysis area for security and forage. Values of these indicators will also be provided for only the Custer Gallatin portion of the EAU for context. This document also states that cover assessments conducted for a project-level analysis within the EAU should include a consideration of the condition (health), quantity, location, and configuration of desirable cover conifer species (USDA 2013b and USDA & FWP 2013). Specific to elk, the amount and type of available cover should accommodate the needs of elk relative to an assessment of limiting habitat factors (forage, cover) within the EAU (USDA 2013b and USDA & FWP 2013). The Framework document does not require the assessment of hiding cover at the EAU scale, likely due to the fact that individual Forest have specific standards for cover that must be met for NFS lands on that Forest. The project area lies within a single EAU: the Henry's Mountains EAU. In this case, the analysis area for cover will be all National Forest System (NFS) lands within the Henry's Mountains EAU. Cover values at the entire EAU scale (including all lands) will be provided for context. The analysis of elk hiding cover (in relation to the Forest Plan hiding cover standard) is done at the scale of all NFS lands within the Henry's Mountains EAU, which is consistent with a recent District Court ruling for the North Hebgen Project.

Moose winter range is the most critical habitat component in the project area with respect to moose. There is no direction in the Forest Plan (USDA 2022) or other readily available resources for determining analysis area size for analysis of moose winter range habitat. For the South Plateau Project, the analysis area for moose winter range will be all moose winter range south of State Highway 20. The analysis area for moose is approximately 11,842 acres in size.

The temporal boundary for the project is from project initiation to 15-20 years after project completion. Most effects of the project would occur during implementation (temporary effects to security, disturbance, etc.), with the exception of impacts on hiding cover. It would take about 15-20 years for regenerated stands to grow tall enough and dense enough to provide hiding cover.

Figures 16 and 17 depicts the spatial relationship between the Proposed Action and the Henry's Mountains EAU and the moose winter range analysis area. Table 33 shows the total acres of the EAU, the amount of the EAU that lies on National Forest System lands on the Custer Gallatin National Forest, and

the amount of the EAU that lies on National Forest System Lands (Custer Gallatin, Beaverhead-Deerlodge, and Caribou-Targhee National Forests).

Table 33: Henry's Mountains EAU

EAU	Total Acres	Acres on NFS Lands - Custer Gallatin NF	Acres of NFS Lands - CGNF, BDNF, & CTNF
Henry's Mountains	369,120	121,920	236,125

7.2.3.2 Methods Used for Analysis

Wildlife biologists from the Forest Service and Montana Department of Fish, Wildlife and Parks compiled recommendations, along with a discussion of their conversations and the relevant literature, for elk habitat management in a collaborative overview that was made available in 2013 (USDA Forest Service and Montana Department of Fish, Wildlife, and Parks 2013). The document was used to create the *Custer, Gallatin, Helena, and Lewis and Clark National Forests - Framework for Project-Level Effects Analysis on Elk* document (USDA 2013b), a non-prescriptive white paper that provides a menu of analytical methods to assess the potential effects of Forest Service project activities on elk habitat that is applicable only to the Custer, Gallatin, Helena and Lewis and Clark National Forests. The analysis presented in this report relied on the recommendations and discussions presented in these documents. As recommended in that paper, analysis of project-level effects on elk habitat will include consideration of forage, cover, and security areas.

It is important to note that the R1vMap15 product used in models described below only covers lands in Region 1 of the Forest Service. Available data for Forest Service Region 4 and Yellowstone National Park was crosswalked in order to enable models to function over the entire EAU. For those portions of the EAU outside of the area covered by R1vMap data (USFS Region 1), Landfire data was used (and crosswalked) to permit modeling at the larger EAU scale. Landfire data attributes were crosswalked to conform to R1vMap terminology and definitions in order to allow models to function.

For moose, Montana FW&P data regarding moose winter range was overlaid with vegetation data and proposed units to determine the extent of affected winter range and winter range cover.

7.2.3.2.1 Forage

The collaborative recommendations for elk habitat and other pertinent literature were reviewed to evaluate possible impacts associated with the Proposed Action and impacts on elk forage.

7.2.3.2.2 Distribution

7.2.3.2.2.1 Security Areas

Effects of the alternatives on security areas were quantified with the use of a GIS model developed by FS Region 1. The model buffers motorized routes open to the public any time between 1 September and 30 November by 0.5 miles. Remaining polygons that are at least 250 acres in size are identified as elk security areas. This model was run with roads that would be open to the public between 1 September and 30 November, including project roads that would be used for implementation during that time (even though they would be closed to the public), as detracting from security areas. Although project roads would be for administrative purposes only, the collaborative recommendations state that "consistent, frequently-used non-public routes or temporary roads that are used during hunting season(s) would also

need to be included in any security analysis". Because use on project roads would be frequent and consistent during implementation, they were included in the analysis for determining effects on elk security areas.

7.2.3.2.2.2 Hiding Cover

Canfield (2011) provides guidance and interpretation of the 2015 Forest Plan hiding cover standard for ensuring compliance during project level analyses. This document was written in order to address court findings in the Smith Creek Project (Hapner v. Tidwell) case. This document clarified how hiding cover analyses would be done, and highlighted that the ultimate goal was to amend the Forest Plan to clarify the standard (and make it consistent with the Canfield direction document). This was done when the Forest Plan Clean-Up Amendment was signed in 2015; the hiding cover standard was amended to clarify the intent of and process for analyzing hiding cover. The 2022 Forest Plan for the Custer Gallatin National Forest does not contain a standard for hiding cover. It does provide a guideline for Big Game that states "To maintain functionality of key big game habitats, management activities should retain hiding cover, thermal regulation, or snow intercept for moose, elk, or deer when analysis demonstrates suitable amounts of these components are limiting. Exceptions may be allowed for the following reasons…" (USDA 2022, Guideline FW-GDL-WLBG-01). To be consistent with previous analyses and the guiding documents for assessing impacts to elk, the previous definition of hiding cover will be used in this analysis. Hiding cover has been defined as "vegetation capable of concealing 90% of a standing adult big game animal from the view of a human at a distance equal to or less than 200 feet. Based on field studies on the Custer Gallatin National Forest, spring/summer/fall hiding cover is provided by tree species or species mixes that are naturally capable of having relatively dense (≥40%) canopy cover (Canfield 2011). Field data (Canfield 2011) showed that these types of forested stands were sufficient to hide more than 90 percent of both a cover board and an elk decoy at 200 feet in distance. For this reason, the definition of hiding cover will include all Douglas fir, lodgepole pine, and subalpine fir conifer forest cover types (on National Forest System lands) with at least 40% canopy cover (on National Forest System lands) (USDA 2015b and Canfield 2011). Hiding cover therefore only includes forested vegetation that has the potential to provide hiding cover; it does not include conifer stands that are naturally open (e.g. ponderosa pine stands) or where closed canopy stands are not sustainable (e.g. whitebark pine stands) over time. Existing hiding cover are those stands in appropriate cover types that are capable of hiding 90% of a standing big game animal at 200 feet. Affected stands are those that are capable of providing hiding cover but that have been affected by timber management and fire within the last 15-20 years.

A GIS model developed by FS Region 1 was used to quantify the amount of cover in the analysis area, based on these findings. The model was based on R1vMap15. Forested stands dominated by Douglas fir, lodgepole pine, or subalpine fir with a canopy cover of at least 40% were considered to provide cover. Within elk winter range identified by MFWP and Idaho Fish and Game, cover was further attributed as winter cover. Otherwise, cover was considered important for spring, summer, and fall. While Winter and Spring/Summer/Fall cover are modeled separately and may have different functions, they are summed for the purposes of analysis. Timber management activities and fire history were intersected to see where timber harvest and/or fires have impacted cover. The dominant habitat type group in the analysis area is "Cool and Dry to Moist" sites, which are fairly productive, so recovery from disturbance was estimated to take approximately 15 to 20 years across the analysis area. Stands affected or planned to be affected by harvest that are not reflected in FACTS activity data for the USFS unit in question are also appended to the affected stands to ensure that the existing condition of cover is as accurate as possible.

As the previous hiding cover standard for the Custer Gallatin National Forest applied only to NFS lands, the cover modeled at the EAU scale was overlaid with NFS lands (including the Custer Gallatin,

Beaverhead-Deerlodge, and Caribou-Targhee National Forest). Cover levels at the entire EAU scale (including all lands) are provided as well.

7.2.4 Affected Environment

7.2.4.1 Existing Condition

Elk and moose are important as hunted big game species and represent a major prey species (especially elk) for large carnivores. The shared goal of MFWP and the USFS is to maintain and provide habitat for big game wildlife species on NFS land throughout the year (USDA Forest Service and Montana Department of Fish, Wildlife, and Parks 2013).

Elk are present across the entire analysis area; however, their distribution varies spatially (based on habitat availability) and temporally. For example, according to MFWP, most elk use occurs west of the South Fork Madison River road to Reas Pass, although elk use could occur to the east of the road too (Cunningham 2019, Personal Communication). MFWP stressed that although collar data do not show the area east of the South Fork Madison River as being of high importance, elk are still likely to use the area at times throughout the year, especially where water is available. Based on conversations with FWP, there is little effective winter range in the project area, and there are no important seasonal travel corridors in the area. During the fall, elk tend to move out of the Hebgen Basin to avoid the harsh winter climate and spend the winter months in the milder Madison River Valley to the north and west. A small number of elk occasionally winter along the north shore of Hebgen Lake and in snow-free pockets adjacent to the Madison River. Moose show a patchier distribution than elk. They are generally most prevealent in the lower elevations of the basin associated with riparian areas with dense shrub cover, wet meadows, and associated timbered stands. Moose are a common occurrence along the lower portion of the South Fork Madison River, Cream Creek, and Buttermilk Creek in the area south of Highway 20.

7.2.4.2 Forage

Generally speaking, elk feed primarily on grasses in spring, with forbs becoming more important in summer. They switch back to grasses and also start to include browse species by fall and into winter. While forage is important year-round, forage quality is particularly important to elk in the summer when animals accumulate fat reserves that influence winter survival (Canfield et al. 1999). Summer forage also influences pregnancy rates.

Most of the project area consists of forested areas. While there is some forage available under denser forest canopies, the amount and quality of such forage is limited by reduced exposure to sunlight, competition for water and nutrients from conifers, and unfavorable soil conditions resulting from high concentrations of conifer needles. More open forests provide more foraging opportunities for elk. The nutritional resources available to elk on summer range are of particular importance because females must meet the nutritional demands of lactation, while also accruing fat reserves for the winter (Ranglack et al. 2016). During this critical summer period, nutritional resources slowly decrease as plants advance through phenological stages (ibid). Within the project area, different habitat types provide a range of forage opportunities for elk.

Riparian areas also provide important food sources for elk. Studies in Montana indicate that elk show a preference for moist sites during summer months. These sites are selected based on juxtaposition with other habitat components such as forest cover, and are generally associated with forest habitat types in the subalpine fir and spruce series (Lyon et al. 1985). Riparian areas are abundant in the western portion of

the project area and include streams, springs, small ponds, and small wetlands/wet meadows. Water in general is lacking in the eastern portion of the project area.

Aspen stands provide a particularly nutritious and palatable food source for elk, who prefer to forage on the young, regenerating shoots during some portions of the year. In the project area, elk utilize aspen stands that occur in the western portion of the analysis area, generally at lower elevations. Field observations indicate that aspen sustainability in the project area is threatened by competition with encroaching conifers, primarily Douglas-fir, lodgepole pine, and to a lesser extent subalpine fir and spruce.

At the larger landscape scale, a mosaic of forage conditions is present, including dense forested stands, moderately dense stands, limited open park-like stands, riparian areas, aspen, open wet and dry meadows, and foraging areas created by management or disturbance activities.

Winter is a critical time of year for moose because forage quality and availability is low, and energetic costs of moving through deep snow and maintaining body heat in cold temperatures are high (Canfield et al. 1999). Unlike ungulates in the northern Rocky Mountains that migrate to lower elevation valleys with less snow accumulation, moose often remain at higher elevations with greater snow accumulation. Winter habitat for moose is variable across their range, but always includes concentrations of accessible browse. Willow and aspen are among the most palatable browse species to moose. These habitats are often heavily used if snow conditions allow. At snow depths of around 30-40”, moose will shift from open browse fields to dense stands of conifers where snow depth is ameliorated by canopy cover and shading reduces crusting of snow. In the Greater Yellowstone Area, older lodgepole pine forests with subalpine fir understory were found to be heavily used by moose under such conditions. Although subalpine fir is a preferred browse species for moose, diet analysis (based on sampling of moose pellets/scat during the winter) in the Hebgen Basin indicated that lodgepole pine also comprises a large proportion of moose browse. Moose select forest patches with high concentrations of browse to minimize energetic costs of feeding. Please refer to further discussion in the”Hiding Cover” section below.

7.2.4.3 Distribution

7.2.4.3.1 Security Areas

“Security” for elk is the result of a combination of factors that allow elk to remain in a specific area while under stress from hunting (Christensen et al. 1993). “Security area” (the structural constituent of security) is the area that will, during periods of hunting stress, hold elk because of geography, topography, vegetation, or a combination of these factors (Lyon and Christensen 1992). Security areas are intended to reduce elk vulnerability during the elk hunting season, and to provide animals the opportunity to meet their biological needs without making large range movements (e.g., to private land where hunting is not allowed) (Lyon and Canfield 1991). Ranglack and others (2017) found that during hunting season elk selected for areas that restricted access to public hunters, were further from motorized routes, and had higher canopy cover. Ranglack (ibid.) recommends managing for areas with 9% canopy cover that are up to 1,535 meters from motorized routes during rifle season and increasing the amount of security in areas that receive high hunter effort. DeVoe and others (2019), elk occupying higher-risk home ranges (such as those on public land) selected more strongly for areas farther from motorized routes and maintained or increased selection for areas with higher forage quality. Given that the South Plateau area does not receive high hunter effort, the definition of security provided by the analysis framework document (USDA 2013) will be used.

Table 34 lists the amount of elk security areas in the Henry's Mountains EAU. The Henry's Mountains EAU has 169,898 acres of elk security areas, which accounts for 46% of the EAU. Existing security areas in the EAU are displayed in Figure 18.

Table 34: Acres and percent of elk security areas in the Henry's Mountain EAU under current conditions.

Elk Analysis Unit	Elk Security (Acres)	Elk Security (% of EAU)	Not Elk Security (Acres)	Not Elk Security (% of EAU)	Total
Henry's Mountains	169,898	46%	199,222	54%	369,120
Henry's Mountains (Custer Gallatin NF lands only)	48,610	40%	73,310	60%	121,920

7.2.4.3.2 Hiding Cover

Forested cover is important to elk for bedding, foraging, thermal relief, wallowing, and other functions year-round. Cover may influence the way animals use habitat and the ability of habitat to meet big game needs for growth and welfare requirements (Christensen 1993). For example, Rowland and Wisdom (2012) found that late summer forage quality for elk in the Blue Mountains was highest where it was within a forest cover type.

This analysis focused on effects of the project on seasonal cover, including, both, 1) winter cover, and, 2) spring, summer, and fall (SSF) cover. Forested cover on winter range can have multiple functions including snow interception, thermal/temperature modulation, improved foraging conditions, and to provide areas that "hide" animals and provide security in the face of disturbance (Cook et al. 1998). Mysterud and Ostbye (1999) noted the importance of winter cover for both canopy cover, which shelters an animal from above, and ground cover, which hides an animal on the ground. Winter cover can also be is important in providing forage when snow conditions become crusty or icy conditions or when there is deep snow. Thompson et al. (2005) documented the importance of winter cover in increasing forage availability in coniferous stands when snow conditions in grasslands became crusty. They recommended maintenance of connected patches of denser canopies for snow intercept and more open canopy conditions that result in "forested forage".

According to the *Framework for Project-Level Effects Analysis on Elk* document (USDA 2013b), when cover on winter range is removed through stand-replacing events (e.g., clearcutting or high intensity fire), the screening function of forested cover may be recovered in 15-20 years (i.e. these stands will provide adequate screening to hide a standing elk). However, the structural conditions that provide for snow interception may take 60 years or more to re-establish. Mixed severity fires and/or intermediate timber harvest would be expected to result in stand conditions that function for snow interception more quickly. Some timber harvest prescriptions (e.g., thinning in very dense pole stands) may even expedite the time required to develop a multi-storied stand structure that provides both cover and foraging during the winter.

Elk winter range in the Henry's Mountains EAU is present around the South Fork of the Madison River and lower Buttermilk and Cream Creeks, the flats to the north and south of the Madison Arm of Hebgen Lake, the south facing slopes north of Hebgen Lake, and the West side of the Henry's and Madison Ranges. Although considered winter range, elk are seldom observed during the winter in these areas.

The function of cover during spring, summer, and fall may include thermal regulation (keeping animals cooler); lengthening the season of succulence and palatability where adequate understory forage exists and the overstory provides shade, seclusion, or protection from human disturbance (hiding cover) (Christensen et al. 1993). Spring, summer, and fall range is is scattered across the analysis area and is generally located at all elevations, although grass and shrub-dominated areas at low elevation are used sparingly in the summer.

USDA Forest Service and Montana Department of Fish, Wildlife and Parks (2013) concluded that a specific quantifiable cover recommendation was not supported by the scientific literature. While Lyon et al. (1985) speaks to "good cover" as being two-thirds of the total area, and Thomas et al. (1979) recommended managing for 40% cover and 60% forage for elk, these recommendations have never been empirically tested. Blocks of forested cover were not a strong predictor of elk distribution in a recent study in Montana (Proffitt et al. 2013). While disturbance can eliminate hiding cover function in forested stands, this is not always the case. Forested stands impacted by disturbance such as fire or insects and disease that had at least 40% green canopy cover, but which also had a high proportion of standing dead, may still function as hiding cover (USDA Forest Service 2013b, pg. 9).

Table 35 lists the amount of existing winter and SSF hiding cover and the amount of affected (by disturbance such as fire and regeneration harvest/clearcut) winter and SSF hiding cover at two scales: the entire Henry's Mountains EAU and that portion of the EAU lying on National Forest System lands (this scale is used for assessment of compliance with the Gallatin Forest Plan hiding cover standard). Existing hiding cover in the Henry's Mountains EAU is displayed in Figure 19.

Table 35: Existing hiding cover in acres and hiding cover that has been affected by disturbance in the Henry's Mountains Elk Analysis Unit.

Elk Analysis Unit	Existing- Spring, Summer, Fall	Existing- Winter	Existing- Total	Affected- Spring, Summer, Fall	Affected- Winter	Affected- Total
Henry's Mountains (All lands)	99,952	22,380	122,332	6,670	1,916	8,586
Henry's Mountains (NFS lands only)	80,675	21,444	102,119	3,103	1,916	5,019

The baseline (or potential) level of hiding cover is the sum of the existing and affected hiding cover (winter and SSF) for a given area. For purposes of this analysis (based on previous methodology for hiding cover analyses) all National Forest System lands within the EAU are considered. At the scale of all NFS lands within the Henry's Mountains EAU, the baseline level of hiding cover would be 107,138 acres (existing + affected = baseline). As there are currently 102,119 acres in this area that are providing hiding cover, the existing proportion of Douglas fir, lodgepole pine, and subalpine fir conifer forest cover types (those cover types capable of providing hiding cover) with at least 40% canopy cover that currently function as hiding cover is 95.3% (existing ÷ baseline).

Elk hiding cover was used as a proxy for moose foraging habitat. Based on current vegetation data, there are currently approximately 9,326 acres of hiding cover within moose winter range south of Highway 20.

These stands have canopy closure >40%; it is assumed that they also have multiple canopy layers that would contribute to moose winter forage (browse) and provide for snow interception in the winter.

7.2.5 Environmental Consequences

7.2.5.1 Direct and Indirect Effects

7.2.5.1.1 Forage

7.2.5.1.1.1 Alternative 1 – No Action

Under this alternative, no project activities would take place, and there would be no direct effects of the project on elk or moose forage.

Indirectly, ongoing fire suppression would reduce big game forage as conifers continue to grow and shade out other plant species. This could affect elk distribution as they would be forced to move to areas that provide more abundant and/or higher quality forage. As forage is highly limited in a large portion of the project area due to mid-seral densestand conditions, this may further exacerbate the skewed distribution noted by Montana Fish Wildlife & Parks, which is largely due to a lack of reliable water in the southeast portion of the analysis area. In-growth of conifers would improve moose foraging habitat in timbered stands over time. Riparian areas would decline in function, as increasing tree density would result in higher rates of transpiration and loss of water to the atmosphere, which would diminish water storage capacity and cause a decline in distribution and vigor of riparian habitats. Aspen stands would also decline, as they would continue to convert to less diverse conifer-dominated communities in the absence of fire. Conifer invasion of riparian willow communities may impact the quality of these habitats in the long term.

Continued susceptibility and mortality from insects and disease in the forested communities across the analysis area could be beneficial for understory vegetation, riparian areas, and aspen. As trees die and eventually fall, this would create conditions favorable for growth of understory vegetation since more open canopies allow greater light penetration that would stimulate production. Aspen could benefit from reduced competition with conifers. Riparian areas may also improve, as a reduction in conifers would increase the amount of water available in the system and provide dead wood inputs to riparian zones. Large scale high severity fire would result in an improvement in forage resources in the short term, as removal of overstory conifers would stimulate the growth of grasses, forbs, and shrubs for a time following a fire of this type. Ultimately, conifers would reestablish and forage quality and quantity would again decline.

7.2.5.1.1.2 Proposed Action

Under the Proposed Action, treatments would open up the forest canopy and allow increased sunlight to reach the forest floor and stimulate growth of grasses, forbs, and shrubs that provide forage for elk (Lyon and Christensen 2002, page 564). Timber harvest would damage individual plants and shrubs, but there would be an overall net gain of understory vegetation. The amount and diversity of understory production would vary depending on the site potential (i.e., habitat type). It is expected that this stimulation in understory vegetation would last for a number of years. As conifers regenerate in affected areas, forage quantity and quality would decline. It is estimated that this would occur over a 15 to 30 year period. Ranglack and others (2016) noted that elk summer range habitat selection was driven more by nutritional resources than other factors. The proposed activities would enhance nutritional resources.

Key habitat features and associated high quality forage would be protected through application of design features. In the western protion of the project area (where water is not lacking), they sites would be avoided and their integrity maintained. In the eastern portion of the project area, these features would be buffered at least 50 or 100 feet depending on their size and overall importance to wildlife. Riparian areas would also be protected; activities may occur in these areas where they would benefit riparian conditions and long term health of the riaparian area. The integrity of these areas (structure, function, etc.) would be maintained. See White (2022) and Stringer (2022) for water quality, riparian, and aquatic habitat design features and mitigation measures. These design features and mitigation measures would protect riparian habitats for elk and also ensure that treatments are in compliance with the Forest Plan guidance.

Increases in elk forage would be particularly evident in treatments that increase the health and extent of aspen stands. This activity would occur on approximately 162 acres in the existing stand pool. If aspen are encountered elsewhere, the treatment matrix would allow for clearing around healthy aspen 1 to 2 tree lengths to improve growing conditions for residual aspen. Mechanical removal of conifers within and surrounding aspen stands would stimulate aspen suckering by acting as a slight disturbance and would create a more appropriate full sunlight growth environment. Removing conifer competition allows sunlight to reach the forest floor and enhances natural sucker production already occurring in declining clones, while also sustaining more mature aspen by removing competition. If it appears that recovery of aspen stands continues to be limited by browse pressure from ungulate use, measures to protect aspen regeneration may be used to exclude ungulates temporarily until aspen saplings reach a sufficient height that would preclude further browse pressure.

At the larger landscape and forest scale, the impacts associated with the project would be largely negligible, as herds utilize different landscapes across the Forest. Overall forage conditions may improve slightly at the Forest scale, but it would be elk that use the site-specific area in the vicinity of the project (the EAU in this case, which is the analysis area) that would realize the benefits of these changes in the short and long term.

7.2.5.1.2 Distribution

7.2.5.1.2.1 Security Areas

As a reminder to the reader, elk security areas were defined in this analysis as those areas that are at least 0.5 mile from an open motorized route or project road and at least 250 acres in size.

7.2.5.1.2.1.1 Alternative 1 – No Action

Under the No Action Alternative, no temporary project roads would be built and there would be no changes in road densities. There would, therefore, be no direct or indirect effects on elk security areas.

7.2.5.1.2.1.2 Proposed Action

Vegetative treatment proposed under the Proposed Action would result in temporary reductions in elk security areas. All reductions would be temporary and last only as long as the temporary road is in place on the landscape. Reductions would also not occur all at one time, as implementation of the project would not all occur at once. In addition, as the current stand pool is screened using project sideboards, design features, and other requirements, some temporary roads or portions of temporary roads may be dropped once associated treatment activities are dropped.

As shown in Table 36, under the Proposed Action there would be a temporary reduction in elk security acres totaling 14,093 acres in the Henry's Mountains EAU. The temporary loss of security areas in the

Henry's Mountains EAU would amount to 8.3% of the security habitat in the EAU. These temporary impacts are displayed in Figure 20.

Table 36: Effect of the Proposed Action on Elk Security at the EAU (analysis area) scale and the scale of CGNF lands in the Henry's Mountains EAU.

Elk Analysis Unit	Elk Security (Acres)	Elk Security (% of EAU)	Not Elk Security (Acres)	Not Elk Security (% of EAU)	Temporary Security Reduction (Acres)	Temporary Security Reduction (% of EAU)	Total
Henry's Mountains	155,731	42.2%	213,389	57.8%	-14,167	-8.3%	369,120
Henry's Mountains (Custer Gallatin NF lands only)	35,865	29.4%	86,055	70.6%	-12,745	-26.2%	121,920

Why does this look at such a large area? It's a loss of almost 1/3rd of the security habitat in the project area.

Across the analysis area (EAU), the temporary changes in elk security areas would be relatively large. The data presented in Table 36 assumes that all treatments included in the current stand pool and all temporary roads would be implemented or constructed/used at the same time. This is not the case, as previously described. Because activities would not occur across the entire project area at one time and actual affected acres is expected to substantially decrease due to sideboards, design features, and other limitations, it is expected that elk would be able to find adequate security habitat during the hunting season. In addition, administrative (restricted) and temporary project roads would only be open to motorized use by administrative personnel involved in implementation of the project. Public motorized use of these routes would not be allowed. In response to implementation activities, elk would likely be displaced to areas where disturbance associated with motorized vehicles was less. This would include areas elsewhere in the project area where no temporary road use is occurring or areas outside the project area (but still within the EAU).

Sideboards and design features that were included to reduce impacts on grizzly bear secure habitat would also reduce impacts on elk security areas, because both of the indicators are defined by the placement of temporary project roads. In the Henry's Lake #2 Subunit, secure habitat would be reduced below baseline on up to 1% of the acreage of the largest Subunit in the BMU. This would limit the potential impacts to security areas that would occur in the Subunit at one time; limiting impacts to secure habitat and disturbance on grizzly bears would likewise reduce impacts to elk security areas. Under the Proposed Action, the collective set of temporary project roads affecting secure below baseline would be used for no more than three consecutive years (and effectively decommissioned during year four). To further minimize effects of project roads on elk security areas, public motorized use of project routes would be effectively restricted during project implementation, and project routes would be effectively closed to all motorized use after project completion in a timely fashion (the set of roads affecting grizzly bear secure habitat may be used to implement the project for up to three years and decommissioned during the fourth year).

Hunters are still likely to use project routes for non-motorized travel. This may result in slight increases in hunting pressure on elk where these roads have been built. This impact would be temporary, as decommissioning would reduce the likelihood that these routes would be used for walking access once

associated treatment units are completed, as the substrate and slash would make travel along them difficult.

The Project would also have permanent impacts to secure habitat, as access management changes are proposed in order to enhance riparian habitat along the South Fork of the Madison River, maintain access to the Reas Pass area, and meet or be better than the secure habitat baseline (a Forest Plan standard) and full-travel plan levels of OMARD and TMARD for grizzly bear. Table 37 below displays the expected permanent effects to security areas in the EAU. These impacts are displayed in Figure 21.

Table 37: Effect of permanent access changes on Elk Security at the EAU (analysis area) scale and the scale of CGNF lands in the Henry's Mountains EAU.

Elk Analysis Unit	Elk Security (Acres)	Elk Security (% of EAU)	Not Elk Security (Acres)	Not Elk Security (% of EAU)	Permanent Security Reduction (Acres)	Permanent Security Reduction (% of EAU)	Total
Henry's Mountains	169,075	45.8%	200,045	54.2%	-823	-0.5%	369,120
Henry's Mountains (Custer Gallatin NF lands only)	47,788	39.2%	74,133	60.8%	-823	-1.7%	121,921

While permanent access management changes would reduce security habitat area slightly, the area in the vicinity of the South Fork Madison River would benefit from decommissioning of a portion of the 478 road, which is currently open to motorized public use. The motorized route in the floodplain of the South Fork, which is one of the few sources of perennial water in this portion of the project area, is likely impacting use of this critical habitat by elk and other big game. Although this area would not be considered security habitat once the portion of the 478 road is decommissioned, it will improve conditions along the river corridor. It is expected that elk use of the corridor would increase once the road is decommissioned.

7.2.5.1.2.2 Cover

7.2.5.1.2.2.1 Alternative 1 – No Action

A high-intensity wildfire or widespread insect and/or disease outbreak could result in a widespread reduction of hiding cover, depending on the location and scale of such an event. Effects on elk could be minimal, if events are localized, or effects could be at more of a landscape scale, which may force elk to alter their distribution in search of areas that provide more suitable cover. Recent research in Montana (Proffitt et al. 2013) indicates that blocks of forested cover were not a strong predictor of elk distribution, so loss of cover may not appreciably impact elk.

Successful fire suppression and subsequent lack of wildfire would maintain or increase the presence of hiding cover on the landscape.

7.2.5.1.2.2.2 Proposed Action

To be most conservative in analyzing potential effects of the Proposed Action on elk cover, it was assumed that all treatments would entirely eliminate cover within the treatment units. This is not actually what would be expected, as some treatments, such as burning or Douglas-fir commercial thinning leave a

large portion of the treatment units intact, and hiding cover would be retained to an extent. Regardless, the Proposed Action would result in some losses of cover for elk. Table 36 displays the expected effects of the Proposed Action on cover, assuming that treatment would eliminate all elk cover in a proposed unit. It is also assumed that all of the acres within the current stand pool would be treated. As noted previously, this is not the case, as sideboards, design features, and other requirements would reduce the acres treated and impact the distribution of treatment units across the landscape.

The Proposed Action would result in a reduction of 13,724 acres of SSF and 4,655 acres of the winter hiding cover in the Henry's Mountains EAU, assuming that all of the proposed activities included in the Proposed Action (units and acres in the current stand pool) are implemented. These impacts on hiding cover are displayed in Figure 20. As noted previously, project sideboards, design features, and other requirements would result in a winnowing down of the acreage included in the current stand pool. For example, sideboards for lynx habitat would limit the amount of regeneration harvest (clearcutting) that may occur in lynx habitat in the project area; acres dropped to meet NRLMD Standard Veg S2 or other design features would be retained as hiding cover for big game and other wildlife.

Locally, the greatest impacts to hiding cover would be in the area immediately adjacent to private lands and other values at risk (homes, powerlines, municipal water infrastructure, etc.) in the northern portion of the project area. Within this fuels concern area, the primary purpose for the proposed activities is to reduce fuel loading and create stand conditions that will alter fire behavior and improve the safety of the public and firefighters. A combination of commercial thinning, regeneration harvest, burning, non-commercial thinning, fuels reduction, and aspen enhancement would be used in this area to meet or move toward the purpose and need for the project. Impacts to vegetation that provides screening for big game would recover in 15-20 years (perhaps less for aspen stands). Given the more widespread nature of impacts that would occur in this portion of the project area, elk use of this area is expected to decrease. Given the fact that the vast majority of the fuels concern area lies outside existing secure habitat, this impact would likely be buffered to a degree. Ranglack and others (2016) also noted that habitat with very low canopy cover (≥13% canopy cover at the 1,000 m scale) was perceived by elk as secure during the fall as long as it was distant from motorized routes. They noted that the often-used 40% canopy cover threshold for security areas is too stringent, and that the influence of motorized routes is more important than canopy cover with regard to elk distribution in the fall. Ranglack and others (2016) also noted that summer range habitat selection was driven more by nutritional resources than other factors like security. While hiding cover would be reduced, forage would be enhanced in these areas.

Aspen stands would be enhanced by removal of competing conifers. Aspen generally regenerates quickly, in comparison to conifer species. In the absence of browse pressure that could inhibit the response of aspen, hiding cover in these areas would be replaced in a much shorter time frame than in stands where conifers would be expected to return.

TAs noted previously, the *Framework for Project-Level Effects Analysis on Elk* document (USDA 2013b) does not mandate use of the EAU as the appropriate scale for cover analyses. It states that project-level analyses within the EAU (not at the EAU scale) should include a consideration of the condition (health), quantity, location, and configuration of desirable cover conifer species. The portion of the EAU on National Forest System lands is the appropriate scale for analysis, as these factors were considered in the analysis.

As shown in Table 36, the Proposed Action (assuming that all acres in the current stand pool would be treated) would maintain 78.2% of acres (on NFS lands) capable of providing hiding cover in a condition that functions as hiding cover. Given that the current stand pool would be narrowed due to project sideboards, design features, and other requirements, the actual post-implementation cover level is expected to be higher than 78.2%.

With respect to moose winter habitat, the current stand pool under the Proposed Action would affect approximately 5,814 acres of existing cover in the moose winter range. This represents approximately 66% of the existing cover in moose winter range in the analysis area. Table 38 displays the effects when the current stand pool (with proposed prescriptions) is overlaid with cover habitat in the moose winter range.

Table 38: Acres of moose winter habitat that would be impacted by proposed treatments.

	Clearcut (acres)	Thinning (acres)	Doug-fir Thinning (acres)	Fuels (acres)	Pre-commercial Thinning (acres)	Aspen (acres)	Burning (acres)
Moose Winter Range	1,615	2,025	583	440	1,062	72	16

As noted previously, this level of impact would be reduced through application of design features and sideboards for the project. In addition, a design feature that would reduce impacts to moose winter foraging habitat will be incorporated during planning and layout of units during implementation. This design feature requires the retention of patches of coniferous forest in moose winter range to provide snow interception, winter forage, and thermal regulation for wintering moose to address FW-GDL-WLBG-01. These patches of untreated forest would range from 0.5 acres up to 5 acres in size, with a preference for larger patches. Patches should be provided in mid-aged and older mixed conifer/subalpine fir/lodgepole pine stands that have multiple canopy layers and good levels of regeneration within 5 meters of the ground. These patches would be retained adjacent to riparian shrub communities where feasible. Patches would be retained in appropriate conifer stands on at least 20% of proposed treatment acres. Retention of coniferous winter forage habitat under this design feature would temper impacts to moose winter forage habitat. As the current stand pool includes 5,814 acres of moose winter range cover, application of this design feature would result in approximately 1,163 acres of proposed treatment in cover stands in the winter range being dropped from treatment when unit layout occurs. As a result, approximately 50% (5,814-1,163) ÷ 9,326 total acres of cover in moose winter range) of moose winter cover in the analysis area would be affected by treatment activities.

Table 39: Effect of the Proposed Action on elk hiding cover at the EAU scale and the analysis area (Gallatin NF lands within the EAU) scale.

Elk Analysis Unit	Reduction in Spring, Summer, Fall Hiding Cover (Acres)	Reduction in Winter Hiding Cover (Acres)	Post[1]- Spring, Summer, Fall Hiding Cover (Acres)	Post- Winter Hiding Cover (Acres)	Post- Total Hiding Cover	Post- Spring, Summer, Fall Affected Hiding Cover (Acres)	Post- Winter Affected Hiding Cover (Acres)	Post- Total Affected (Acres)	Baseline Hiding Cover[2] (acres)	Hiding Cover Remaining (% of Baseline)
Henry's Mountains	-13,724	-4,655	86,228	17,725	103,953	20,394	6,571	26,965	130,918	79.4
Henry's Mountains (NFS lands only)	-13,724	-4,655	66,951	16,789	83,740	16,827	6,571	23,398	107,138	78.2

[1]Post-implementation hiding cover is the amount of existing hiding cover once the Proposed Action is overlaid. For purposes of analysis it is assumed that all treatments will eliminate hiding cover; as noted previously, sideboards, design features, and other requirements will reduce effects as the current stand pool is filtered down, and some treatment activities will retain hiding cover to a degree (e.g. burning).

[2]Baseline hiding cover is the sum of existing hiding cover and affected hiding cover. Canfield (2011) provides guidance and interpretation hiding cover with respect to project level analyses. As this document was produced to provide direction for analyses of hiding cover with respect to Forest Plan compliance (hiding cover is no longer a standard under the 2022 Forest Plan), the appropriate scale of the analysis is the portion of the EAU lying on National Forest System lands (including the Custer Gallatin, Beaverhead-Deerlodge, and Caribou-Targhee National Forests).

7.2.5.2 Cumulative Effects

7.2.5.2.1 Forage

The current forage conditions described for the analysis area are a result of past and present actions that have occurred across the analysis area landscape. These have included timber harvest on public land, past wildfires, prescribed burns, noxious weed control, subdivisions and commercial activities on private lands, grazing activity, and bison management. Recent fires will likely improve forage for elk due to fire-caused mortality in dense regenerating conifers (allowing grass and forb production) and consumption of above-ground litter (stimulating sprouting of grasses, forbs, and shrubs).

Future actions anticipated to occur in the analysis area (EAU) that will affect elk forage include a portion of the North Hebgen Multiple Resource Project. A small portion of this project overlaps the Henry's Mountains EAU along the north shore of the Madison Arm of Hebgen Lake. Wildfire is also expected to occur, but the intensity and frequency of these events is difficult to predict and could be affected by implementation of this project. Noxious weed control will also continue into the future, along with subdivision and commercial activity on private lands, grazing activity, and bison management. The North Hebgen Project would increase elk forage in a portion of the EAU through commercial thinning, regeneration harvest, non-commercial thinning, group selection, and aspen improvement cuts. These activities will both open up the forest canopy and create conditions favorable for understory vegetative species. Noxious weed control will also benefit elk forage by suppressing the invasives and allowing important native forage species to persist. Grazing activity has mixed effects on elk forage. Effects of grazing are expected to continue in a similar fashion as they are being conducted currently, and no changes that would have a notable effect on elk forage are expected. Bison management activities are ongoing and may have an effect on elk forage, as both species rely on herbaceous species. Bison are expected to continue to use the landscape much as they currently do; although, recent changes in bison management will allow for increased flexibility in how bison are managed, which may result in bison using habitat on Horse Butte and north of Hebgen Lake for longer portions of the year.

The Proposed Action, when combined with the residual impacts of past and present activities and the expected impacts of reasonably foreseeable future actions in the analysis area, would result in an overall benefit to elk forage. In addition to the North Hebgen Project, which would enhance elk forage, this project would result in additional forage enhancement through thinning, regeneration harvest, and aspen restoration activities.

7.2.5.2.2 Distribution

7.2.5.2.2.1 Elk Security Areas

The existing conditions for elk security areas reflect the presence of roads on the landscape that have resulted from past actions. These have included past timber harvest, construction of state and county roads and highways, and road building on private lands, especially those associated with subdivisions and other commercial activity.

Travel plan implementation has been completed in the Hebgen Lake District, and no future permanent FS roads are expected to be built.

Reasonably foreseeable future actions in the Henry's Mountains EAU include the North Hebgen Project. A portion of this project is located in the Henry's Mountains EAU. The North Hebgen Project would have minor impacts on secure habitat; there would be a temporary reduction in secure habitat of 186 acres under this project. When combined with the impacts associated with the Proposed Action (current stand

pool, which will be reduced through application of sideboards, design feature, and other requirements), secure habitat in the EAU would remain 42.2% during project implementation, assuming that all proposed treatment acres and temporary roads are implemented and that they would all be implemented simultaneously.

7.2.5.2.2.2 Cover

The current hiding cover conditions described for the analysis area are a result of past and present actions. These have included timber harvest on public land, past wildfires, past prescribed burns, and subdivisions and commercial activities on private lands.

Future actions expected to occur on Custer Gallatin National Forest lands in the Henry's Mountains EAU that would affect elk cover include the North Hebgen Multiple Resource Project. A portion of this project is located in the Henry's Mountains EAU and will affect hiding cover within the EAU. The North Hebgen Project would affect up to 718 acres acres of elk hiding cover in the EAU under the selected alternative. These treatments would occur in SSF and winter hiding cover. When the effects of the North Hebgen Project (-718 acres hiding cover) are added to those of the South Plateau Project (-18,379 acres hiding cover for the current stand pool, which would decrease when sideboards, design features, and other requirements are applied), there would be a total of 83,022 acres of hiding cover on NFS lands in the EAU. When this existing level is divided by the baseline hiding cover for the analysis area (107,138 acres), there would be 77.5% of capable acres in a hiding cover condition.

7.2.6 Consistency with FP direction specific to Big Game

Table 40 lists the FP standards that apply to elk and big game habitat management and how implementation of the action alternatives would be in compliance with those standards.

Table 40: FP direction specific to Big Game and how the project complies with FP direction

Standard/Guideline	Compliance
Guideline FW-GDL-WLBG-01 To maintain functionality of key big game habitats, management activities should retain hiding cover, thermal regulation, or snow intercept for moose, elk, or deer when analysis demonstrates suitable amounts of these components are limiting. Exceptions may be allowed for the following reasons: a) For safety issues such as hazard tree removal. b) For hazardous fuel reduction projects aimed at reducing fire risk around infrastructure and to private property. c) Where research or restoration is needed for conservation of at-risk species.	The project would retain a high level of hiding cover post-implementation. The Proposed Action (assuming that all acres in the current stand pool would be treated) would maintain 78.2% of acres capable of providing hiding cover in a condition that functions as hiding cover. Given that the current stand pool would be narrowed due to project sideboards, design features, and other requirements, the actual post-implementation cover level is expected to be higher than 78.2%. Collaboration with Montana FWP indicated that there may be a need to reduce impacts to moose winter habitat. A design feature was included in the project that would reduce impacts to potential moose winter foraging habitat in moose winter range. In moose winter range, application of design features (developed through collaboration with Montana FWP) would reduce impacts to cover (moose winter foraging habitat) in the moose analysis area. Approximately 50% of existing cover (potential forage and snow interception) in moose winter range would be affected by proposed treatment activities.

Standard/Guideline	Compliance
Guideline FW-GDL-WLBG-02 To avoid stressing wildlife when energy demands are high, management activities should be located and scheduled to minimize disturbance of wild ungulates on winter ranges during the winter and in known calving, fawning, lambing, or kidding areas during the reproductive season. Exceptions may occur when needed for protection of other resources as mandated by law, regulation, or policy. In such cases, management activities should be concentrated in time or space to reduce impacts to wild ungulates.	A design criteria has been included in the project that prohibits vegetative treatment activities in big game winter range from December 1 through April 30 minimize disturbance to wintering big game.
Guideline FW-GDL-WLBG-03 If current conditions indicate that secure habitat is limiting in a particular area, then road construction and reconstruction should not result in a reduction of secure habitat in that area during big game hunting seasons (archery and rifle). The intent of this guideline is to maintain secure habitat during a time when big game animals are vulnerable, and added pressure from hunting may cause displacement of wild ungulates from public land.	Consultation with Montana Fish, Wildlife & Parks personnel regarding the project did not indicate that secure habitat is limited or that temporary project impacts would displace big game in the area to adjacent private lands. All impacts to secure habitat associated with vegetative treatment would be temporary. Permanent changes to the road network and access management would respond to identified sediment issues along the South Fork Madison River and other identified needs (e.g. improvement of grizzly bear secure habitat). While these changes would result in a minor (0.5% or 823 acres) permanent reduction in secure habitat at the EAU scale, there would be an overall reduction in routes open to motorized use post-project of approximately 8.2 miles. Although it would not be classified as an elk security area after permanent changes are implemented, motorized travel would be eliminated on approximately 3 miles adjacent to the South Fork Madison River. Removal of motorized disturbance along this portion of the South Fork Madison River would aid in protecting the integrity of key riparian foraging habitat.

7.2.7 Summary and Conclusion

The Proposed Action would increase elk forage by increasing understory production and enhancing aspen stands. Elk security areas will be reduced temporarily through implementation of vegetation treatment activities. These impacts would affect the distribution of elk while implementation is occurring. The impacts associated with the Proposed Action would not occur all at once, as design features and other requirements (standards) would restrict the amount and/or extent of certain activities (temporary secure grizzly bear habitat impacts, regeneration harvest limits, etc.) within the project area. Permanent change in access designations would result in a slight permanent decrease in security areas for elk in the EAU. Elk hiding cover will be reduced, but hiding cover is widely abundant across the analysis area and elk would be able to adjust their movements and use of the landscape to seek out hiding cover. Potential winter foraging habitat (in coniferous stands) for moose would also be reduced by the proposed action. Through collaboration with Montana FWP design features would be implemented to reduce these impacts and provide appropriate winter foraging habitat in the analysis area post-implementation. Because expected disturbance impacts would generally be temporary, spatially and temporally spread over the

project area, an increase in structural heterogeneity and forage, and would meet Forest Plan direction for Big Game the Proposed Action would not have a significant impact on this group.

8 Other Species or Issues

8.1 Migratory Birds

Migratory birds are a very diverse group, which includes raptors, waterfowl, shore birds, upland game birds and songbirds. Migratory bird species are protected under the IMBTA. Executive Order 13186 requires agencies to ensure that environmental analyses evaluate the effects of federal actions and agency plans on migratory birds, with emphasis on species of concern. The Montana Natural Heritage Program (MNHP) Environmental Summary Report (Montana Natural Heritage Program 2019b), 2021 Birds of Conservation Concern (BCC) report (US Fish and Wildlife Service 2021), and the online iPaC Resource (US Fish and Wildlife Service 2019) were used to identify focal species for this project. The MNHP serves as the state's information source for animals, plants, and plant communities with a focus on species and communities that are rare, threatened, and/or have declining trends and as a result are at risk or potentially at risk of extirpation in Montana. Montana Animal Species of Concern (MTSOC) are native Montana animals that are considered to be "at risk" due to declining population trends, threats to their habitats, and/or restricted distribution. The iPaC resource was used to identify migratory birds that are a concern that may be present in the project area.

Migratory bird species of concern considered for this project include those that have been documented in the vicinity of the project area and for which the project area contains suitable habitat. A number of species on these lists would not be affected by the proposed activities because appropriate habitat is not present in proposed treatment locations or within the project area; these species will not be considered further. Migratory bird species of concern (SOC), including MTSOC and BCC, which could potentially be impacted by the proposed treatments are listed in Table 57. Some migratory bird species of concern were previously addressed under separate headings and will not be analyzed in this section. These include the bald eagle. Other migratory bird species of concern (SOC), including MTSOC and BCC, that could potentially be impacted by the proposed treatments and that have not yet been analyzed in this report are listed in Table 39. These include the brown creeper, Cassin’s finch, Clark’s nutcracker,evening grosbeak, calliope hummingbird, Williamson’s sapsucker, Pacific wren, great grey owl, olive-sided flycatcher, veery, rufous-sided hummingbird, broad-tailed hummingbird, northern goshawk, and black-backed woodpecker.

8.1.1 Issue

Habitat modification through vegetative treatment activities can alter the quality and quantity of habitat available for migratory bird species by changing vegetative structure and composition or it can affect distribution of migratory bird species through disturbance.

8.1.2 Resource Indicators and Measures

Effects of the Proposed Action on migratory Birds of Conservation Concern (BCC) and Montana’s Species of Concern (MTSOC), collectively referred to as species of concern (SOC) in this analysis, were compared by evaluating disturbance factors and expected alterations in habitat. There are no established thresholds for these indicators that the Forest uses as a target level for which to manage, and the FP does not contain any quantitative standards specific to these indicators. The conclusion of how changes in these indicators would affect migratory songbirds was, therefore, qualitative in nature.

8.1.3 Methodology and Information Sources

8.1.3.1 Spatial and Temporal Context for Analysis

The spatial context for the analysis of effects on migratory bird SOC was the project area boundary itself. The time frame for analysis was the time period extending from project implementation to project completion.

Table 41: Resource indicators and measures for assessing effects on migratory bird species of concern

Issue	Resource Indicator	Measure- No Action	Measure- Proposed Action	Used to address: P/N, or key issue?	Source
Project has the potential to affect habitat	Effects on habitat	Ongoing fire suppression leads to mixed effects. Insect/disease increase leads to mixed effects.	Mixed effects. Species selecting for openings, edge, or shrub/conifer regeneration would benefit from the proposed activities. Species preferring closed canopy conditions or large blocks of undisturbed mid-seral stands would experience temporary habitat losses.	No	Review of effects of similar activities from pertinent scientific literature
Project has the potential to cause disturbance	Analysis of disturbance	No effect	The project would cause temporary disturbance that may affect the distribution of migratory birds and /or affect nesting locations.	No	Review of effects of similar activities from pertinent scientific literature

8.1.3.2 Methods Used for Analysis

Pertinent literature was reviewed to evaluate expected effects of the alternatives on migratory bird SOC.

8.1.4 Affected Environment

8.1.4.1 Habitat

The CGNF provides breeding habitat for a large number of migratory bird species. This extremely diverse group occupies all types of habitat in the vicinity of the project area including streams, wetlands, riparian areas, grass/forb meadows, shrub lands, deciduous forest, coniferous forest, mixed forest and rock outcrops. Within the project area, forested habitats provide trees, shrubs, snags, and surface vegetation for nesting birds. Riparian areas support a high diversity of migratory bird species. Forage is abundant in the project area with birds, small mammals, and insects providing prey for a number of species. Seeds, berries and other vegetative food sources are also abundant in some areas.

Snags (standing dead trees) are an important habitat component for migratory songbirds and are used for nesting, roosting, and foraging by a number of migratory bird species. Coarse woody debris (fallen snags

and larger dead, down woody material) also provides foraging substrates, perches, and cover for migratory birds. As reported in the Forest Vegetation Specialist Report, FIA data were used to estimate the abundance of these components by mountain ranges that intersect the project area (Nosal and Demastus 2022). The Henry's Range was estimated to have 6.3 standing dead snags greater than 10″ dbh per acre. The Henry's Range was estimated to have 3.7 tons of coarse down woody debris greater than 3″ in diameter per acre.

The project area is within Bird Conservation Region (BCR) 10; there are 24 Birds of Conservation Concern (BCC) within this region (USFWS 2021). Seven of these species have been documented in the vicinity of the project area and/or potential habitat is present in proposed treatment units. The MTHNP Environmental Summary Report for the Project Area (MTNHP 2021) lists the Montana Species of Concern (MTSOC) and other bird species that have been documented in or adjacent to the project area. There are 52 birds species listed in the MTHNP Environmental Summary Export (MTNHP 2021). The Project Area was buffered by > 0.5 miles, and therefore encompasses habitat and associated species that are not present in the Project Area or in potential treatment units. Nine of these species have been documented in the vicinity of the project area and/or potential habitat is present in proposed treatment units. The SOC identified for this project are generally associated with forested environments, and utilize a variety of habitat components. Table 42 lists the migratory bird SOC analyzed in this section and their preferred habitats and nesting habits.

Table 42: Migratory bird SOC that might occur in the project area and preferred habitat and nesting habits

Species	MTSOC/ BCC	Preferred Habitat and Nesting Habits
Brown creeper	MTSOC	Found in dense, moist coniferous forest types. They are more common in old growth than mature forest, and are rarely found in logged areas in the Northern Region (USDA 1999 pg. 38). Brown creepers nest under the flaking bark of coniferous trees, and forage primarily on insects, nuts and seeds (Ehrlich et al. 1988 pg. 434).
Cassin's finch	MTSOC/BCC	Found in most conifer forest types in the Northern Region, but are most frequently detected in post-fire and partial cut areas (USDA 1999 pg. 66). They build a cup nest in coniferous trees and feed on seeds, insects, buds and berries (Ehrlich et al. 1988 pg. 644)
Clark's nutcrackers	MTSOC	Broadly distributed across conifer forests of the Northern Region and are thought to be tied to areas of high conifer seed production (USDA 1999 pg. 31). This species builds a cup nest in conifer trees, and feeds primarily on pine nuts and other conifer seeds, but will also take fruits, insects, invertebrates, bird eggs and small nestlings (Ehrlich et al. 1988 pg. 410).
Evening grosbeak	MTSOC/BCC	The Evening grosbeak builds a cup nest, generally in conifers but sometimes in deciduous tree species as well. They feed primarily on seeds, fruit and insects gleaned from foliage (Ehrlich et al. 1988 pg. 646).
Great gray owl	MTSOC	In Montana, found in relatively dry, montane forest types. They often nest in abandoned hawk or raven stick nests, but will also use natural depressions on broken top snags or tree stumps for nest sites. Nest sites are often selected based on proximity to open areas, where they hunt for small mammals, primarily rodents (USDA 1994 pp. 163-164, 166).
Calliope hummingbird	BCC	Habitat includes open shrubby montane forest, mountain meadows, second-growth, and willow and alder thickets. Nests are in trees (frequently conifers) at meadow edges or in canyons or thickets along streams, at heights from <1 to 21 meters above ground (usually low, with branch or foliage above) (NatureServe Explorer 2021).

Species	MTSOC/ BCC	Preferred Habitat and Nesting Habits
Williamson's sapsucker	BCC	Habitat includes middle to high elevation montane and subalpine coniferous forest, including spruce-fir, Douglas-fir, western larch, lodgepole pine, and ponderosa pine, and also mixed deciduous-coniferous forest with quaking aspen. Nests in cavities excavated in dead and live trees (NatureServe Explorer 2021).
Olive-sided flycatcher	BCC	Breed in various forest and woodland habitats including subalpine coniferous forest, mixed coniferous-deciduous forest, burned-over forest, and along the forested edges of lakes, ponds, and streams. Most nesting sites contain dead standing trees, which are used as singing and feeding perches. Nests are placed most often in live conifers (NatureServe Explorer 2021).
Pacific wren	MTSOC	Habitat includes old-growth and mature coniferous forests and riparian cottonwoods and aspens. In Montana they are especially common in cedar-hemlock, cedar-grand fir, and spruce-fir forests and are strongly associated with riparian areas. Nests are typically within 2 meters of the ground. Nests in existing cavities, holes in dirt banks, niches in rotting trees, root tangles of fallen trees, clumps of hanging moss, and folds in tree bark (MTNHP 2021)
Veery	MTSOC	Has a strong preference for riparian habitats and disturbed forests with dense understories. Often associated with willow thickets and cottonwood along streams and lakes in valleys and lower mountain canyons. Present in a variety of plant community types (box elder, alder, aspen, cottonwood, and lodgepole pine) with a significant willow component (MTNHP 2021).
Rufous hummingbird	BCC	Habitat includes secondary succession communities and openings, forested and brushy habitats of the Pacific northwest through the Gulf of Alaska coastal forests and inland to northern Rocky Mountains. Typically nests in second growth and mature forests MTNHP 2021).
Broad-tailed hummingbird	BCC	Habitat may include ponderosa pine (Pinus ponderosa) and aspen (Populus tremuloides) groves, mountain meadows, open woodlands (especially pinyon-juniper), and conifer-aspen associations. Also may be found in montane scrub and thickets.
Northern goshawk	MTSOC	Goshawks nest in a variety of forest types including Douglas-fir, western larch, lodgepole pine, and ponderosa pine. Although historically associated with old growth forests, goshawk in the eastern portion of FS Region 1 did not selectively choose either the largest trees or tallest trees in the nest stand for nesting; they appear to use habitat largely in proportion to its availability (Bush et al. 2012).
Black-backed woodpecker	MTSOC	Habitat includes early successional, burned forest of mixed conifer, lodgepole pine, Douglas-fir, and spruce-fir that contain high densities of recently dead or dying trees. Ephemeral in these stands, and move elsewhere after 3-5 years once insect prey source declines. Also found in areas with extensive insect outbreaks causing widespread tree mortality and areas green (live) forests with a natural range of smaller disturbances scattered throughout the forest such as wind throw, ice damage, root rot, or other occurrences that produce small patches of dead trees (MTNHP 2021).

8.1.4.2 Disturbance

Disturbance factors can have negative impacts on migratory birds present during project operations. Spring is the critical breeding time for migratory birds. Pair formation, nest construction, egg-laying, brooding and nestling care, occurs for most species during the period from about the end of March through the end of June. Throughout most of the Forest Service Northern Region, by about mid-July, young birds have fledged, and the breeding season is over (Hutto et al. 1999).

8.1.5 Environmental Consequences

8.1.5.1 Direct and Indirect Effects

8.1.5.1.1 Habitat

8.1.5.1.1.1 Alternative 1 – No Action

Ongoing susceptibility of tree species to insect and disease in forested stands would benefit some migratory bird species while having detrimental effects on others. Increased tree mortality could attract snag-dependent migratory bird species. Standing dead trees provide nesting and foraging habitat for snag-dependent migratory bird species, and also provide perch trees for habitat generalists. Tree mortality would also promote growth of grass, forbs and shrubs, which would favor some migratory bird species that prefer to nest and forage near the ground. However, other species, such as those that require forest interior for breeding habitat, or those with more generalist habitat associations, and that require large, live trees for nesting or foraging, would be negatively impacted by continued tree mortality.

Ongoing fire suppression could have an opposing effect on migratory songbird species. In this case, bird species that prefer more mature, late-successional forested stands would increase, and species that rely on disturbance and more early-successional forest structure would be reduced.

8.1.5.1.1.2 Proposed Action

While habitat alteration can have negative impacts to some bird species, other species could benefit from habitat modifications associated with proposed treatments. For example, individuals that prefer a more open forest structure as well as those that utilize a greater proportion of grass/forb/shrub species within a forested environment could benefit from proposed treatments, whereas those species attracted to dense mid-seral forest or dead/dying forest (dependent on insect prey base and/or snag-dependent species) may be negatively impacted by removal or thinning of overstory trees and the removal of dead and dying trees. These activities would result in a long-term reduction of insect mortality and reduced risk of high-intensity wildfire within treatment units. Birds utilizing aspen stands and whitebark pine stands would also likely benefit in the short and long term to a small degree, as the proposed activities would promote regeneration and increased growth by reducing competition (from conifers) for limited resources. Given the relatively few acres of whitebark pine habitat in the project area, improvements to this habitat type (increased light, nutrients, and creation of planting/caching sites) would be relatively minor.

Proposed treatments (clearcutting, thinning, and Douglas-fir thinning) would directly reduce the availability of snags and coarse woody debris within the treatment units by removing dead and dying trees. The proposed action would indirectly affect the future availability of snags and coarse woody debris in treatment units and perhaps adjacent forest by creating openings or thinning dense mid-seral stands. These activities may slow the spread of insect infestation and consequently reducing snag/coarse woody debris recruitment. Proposed treatments would also reduce fuel loading in treatment units, which would decrease the potential for high severity (stand-replacing) fire, another indirect effect that could impact future snag and coarse woody debris availability. At the landscape scale, untreated areas would continue to be susceptible to high severity fire and insect/disease impacts.

Forest Plan Snag Management direction would be followed so that at least 40 snags would be retained per 10 acres of treatment (i.e. on average, 4 snags per acre). Live snag replacement trees would also be retained to meet Forest Plan standards (5-8 per acre depending on habitat type). In addition, a minimum of 10 tons (and a desired condition of 15 tons) of coarse woody debris per acre would be left in treatment

units, with a preference for larger diameter, longer pieces, and complexity (multiple pices that touch or natural piles). Due to ongoing insect infestations and other natural processes, snag habitat is not limited within treatment units, throughout the project area, or across the surrounding landscape, and following snag management direction in treatment units would retain important habitat components and structure on affected acres for dependent species.

Species of concern identified for the project have various habitat preferences, so proposed treatment could have negative impacts on certain SOC, while having neutral or even beneficial effects for other SOC. It is difficult to make definitive predictions about potential project impacts for bird SOC. Based on habitat preferences listed in Table 42, proposed treatments would likely have negative impacts on brown creepers, northern goshawk, Pacific wren, and Williamson's sapsuckers but could be beneficial for Cassin's finch, olive-sided flycatcher, and calliope and rufous hummingbirds by creating more open stands, encouraging regeneration of small diameter conifers and shrubs, enhancing edge habitat, improving aspen stand health, and providing for large perches. Reduction in the risk of high-severity fire in treatment units may reduce post-fire habitat for olive-sided flycatcher and black-backed woodpecker in the long term in these specific areas. At the landscape scale, stands susceptible to high-severity fire impacts (and/or insect and disease mortality) would be well distributed across the landscape. While individual birds, breeding pairs or family groups might be affected (directly or indirectly through nest abandonement), these effects (positive or negative) would be too minor to have impacts to any species at the population level due to the availability of habitat for these species in the vicinity of affected areas. While activities would occur over a number of years, they will not occur over the entire project area at once; displaced birds would be able to find nesting or foraging habitat in the vicinity. Old growth in moist and wet plant associations would not be treated under this project uness situated in close proximity to a structure; any treatments would be limited to small diameter vegetation in close proximity to the specific value at risk. Old growth in dry plant associations may be treated for restoration of old growth habitat characteristics and ecosystem processes or to increase resilience to disturbances or stressors (such as drought, high severity fire, bark beetles) that may have negative impacts on old growth characteristics or abundance at stand or landscape scales. The size of affected vegetation would be limited to 8 inches dbh or less. Treated old growth would retain old growth characteristics following implementation.

Effects on Clark's nutcrackers would be neutral. Whitebark pine treatments, although highly limited due to the relative scarcity of mature whitebark pine trees and stands of this species in the South Plateau area, would benefit Clark's nutcrackers in the mid and long term as whitebark pine that are released by removing competing conifers mature. Reduction in conifer trees in other areas may be detrimental to Clark's nutcrackers.

The Northern Region landbird habitat relationships (Hutto 1999) indicated that evening grosbeaks feed heavily on spruce budworm, which is one of the tree-damaging agents targeted for reduction with proposed treatments. Therefore there is a potential for negative impacts to grosbeaks that may be utilizing this pest species. Any such impacts would be minor considering the size of the affected area relative to the availability of budworm infested habitat in the larger landscape.

The great gray owl is known to use harvested areas for hunting, so effects on this species would be neutral or slightly negative. Great gray owls have been observed in the Rendezvous Trails area. Commercial harvest (clearcutting, thinning, Douglas-fir thinning, and to a lesser degree aspen restoration thinning) would impact potential nesting habitat for this species. This impact would be most concentrated in the immediate vicinity of private property and other values at risk in the northern portion of the analysis area. Untreated areas would provide well-distributed suitable breeding habitat for this species post-implementation.

Effects to northern goshawk would also be considered negative. Up to 30% of the existing nesting habitat in the analysis area would be affected. As acreage of treatment is expected to decrease in order to meet various sideboards and design features (created openings limited to 40 acres, 500 feet between created opening, reduction in regeneration harvest in lynx habitat to meet NRLMD standards, etc.) it is expected that the actual level of nesting habitat affected would be less. Post-treatment, habitat components (tree size and canopy closure) that contribute to foraging habitat for goshawk would be within or above levels suggested in Brewer and others (2009). Treatment activities would affect prey habitat and consequently the composition of potential prey available to goshawk on treated acres. Potential prey requiring dense stands (e.g. red squirrel) would be most impacted by regeneration harvest. Structural features desired by these prey would be available in thinned stands and untreated stands (including habitat within larger regeneration harvested stands dropped to provide for connectivity between patches of harvest) post-implementation. It is expected that goshawk would be able to access sufficient food to persist in the project area following implementation.

Treatment activities would reduce the risk of high severity fire in portions of the analysis area. Treatments in the northern portion of the project area (adjacent to private lands and values at risk) would be designed to provide for public and firefighter safety by creating fuel conditions that will promote low severity fire that can be controlled by ground forces. These actions would provide for diverse stand structures and composition in the long term, as widespread high severity fire effects would be less likely in some areas. High severity and mixed severity fire would create areas with early seral conditions that would be preferred by some species, including the olive-sided flycatcher.

Decommissioning of a portion of the 478 Road would provide for improved riparian habitat conditions adjacent to the South Fork Madison River. In the long term the decommissioned road would recover and provide structure for foraging and nesting.

For all treatments, the habitat of individual birds, breeding pairs, or family groups might be affected, but these effects (positive or negative) would be too minor (due to the size and distribution of affected areas) to have impacts to any species at the population or planning unit (forest) level. Untreated stands in the immediate vicinity of treatment units would provide habitat for species selecting for dense canopies. Treatment activities would promote a mosaic of structural stages and stand compositions in affected areas following treatment, as created openings, thinned stands, and untreated stands would be interspersed across much of the project area. Project design criteria would be implemented that would potentially reduce impacts by retaining dead wood (snags, downed wood, and replacements) for wildlife and other ecosystem functions, limiting the size of created openings, and providing for untreated areas between created openings.

8.1.5.1.2 Disturbance

8.1.5.1.2.1 Alternative 1 – No Action

With no action, there would be no direct or indirect impacts to migratory bird SOC resulting from project actions.

8.1.5.1.2.2 Proposed Action

Project activities that occur during the migratory bird breeding season could result in the physical destruction of occupied nests, which would likely result in egg/nestling mortality. Disturbance associated with project activities during the nesting season could cause reduced parental care and/or nest abandonment, which could affect nestling survival rates, and possibly result in reproductive failure for some breeding pairs. Birds may change nest locations in response to human disturbance. Alternate nest

sites may be less suitable in terms of security and thermal cover, availability of foraging habitat, perch sites, and other important habitat components. Disturbance outside the breeding season can influence a bird's energy balance, and consequently affect survival rates (Knight and Gutzwiller 1995 pp. 52, 55, 73). Project implementation could occur over several years in a given location. Since some of the proposed activities would occur during spring and summer, it is possible that some migratory birds may already be nesting in the project area, and could therefore be disturbed and/or displaced each year by project activities. Project activities that occur after July 15 would have the least impact on breeding birds, since most young birds have fledged and are independent of the nest by that time. While winter harvest would reduce potential disturbance effects were it to occur, this is unlikely given constraints imposed by recreation (snowmobiling and trail grooming). Given the climate and weather in the project area, it is expected that ground conditions would not be suitable for mechanized harvest activities until at least some time in May, which would reduce the time period where nesting migratory birds may be affected to some degree.

Roads constructed to access proposed treatment units may result in a temporary reduction in habitat for some species. As these roads would not be open to the general public and would be effectively closed and obliterated after implementation, effects to habitat and disturbance would be temporary. These areas would revegetate over time. The portion of the 478 Road that would be decommissioned would also contribute to reduced disturbance in the riparian area djacent to the South Fork Madison River, improving habitat for migratory birds in the long term.

8.1.5.2 Cumulative Effects of the Action Alternatives

8.1.5.2.1 Habitat

Migratory bird habitat currently available in the project area is a product of natural and managed processes, which have shaped the environment over time to produce the existing condition described above in the affected environment section. Past and present actions that have affected habitat for migratory birds within the analysis area include timber harvest, fire suppression, wildfires, noxious weed control, and building of roads and trails. Future activities that have the potential to affect neotropical migratory bird habitat include the West Yellowstone to Reas Pass Rail-to-Trail Project. This project would convert the existing railroad grade (that is currently being used by bicycles) to a multi-use, non-motorized trail. Trail construction could impact individual birds or family groups by displacing or disrupting foraging and/or breeding behavior. Surfacing six to eight feet in width on the existing rail bed would affect a small number of acres (< 8 acres) of low quality potential migratory bird habitat. Direct and indirect effects of the Proposed Action on habitat were considered in the context of these past, present, and future actions. When combined with the minimal impact of the future Rail-to-Trail project, the South Plateau Project would contribute to a minor cumulative impact to habitat. Impacts associated with South Plateau would be temporary, as treated stands would mature over time and provide a mosaic of habitat conditions in the short and long term. In the long term, a reduction in the linear length of road available for motorized travel (through closure of the portion of the 478 Road paralleling the South Fork Madison and decom/obliteration of several administrative routes) would cumulatively increase available habitat, as the road bed would recover and provide structure for foraging and nesting in the long term.

8.1.5.2.2 Disturbance

Migratory birds in the project area are subject to a variety of disturbance factors, depending on their proximity to developed areas or other areas used by humans. Road and trail use, subdivisions, commercial activity, motorized use, dispersed recreation, and a variety of other factors on the landscape all have contributed to disturbance factors on the landscape that have shaped the current distribution of migratory

songbirds in the analysis area. All of these factors have contributed to the current condition of disturbance patterns to migratory songbirds in the project area. Future activities that have the potential to affect neotropical migratory bird habitat include the Rail-to-Trail Project. This project would convert the existing railroad grade (that is currently being used by bicycles) to a multi-use, non-motorized trail. Trail construction could impact individual birds or family groups by displacing or disrupting foraging and/or breeding behavior. When combined with the expeted impacts of this project, the South Plateau Project would contribute to a minor cumulative increase in disturbance in the project area. Disturbance associated with both projects would be temporary. In the long term, decommissioning a portion of the 478 Road would reduce motorized disturbance in the corridor along the South Fork Madison River, resulting in a cumulative improvement in disturbance in the project area.

8.1.6 Summary and Conclusion

Project activities have the potential to affect migratory birds by altering habitat and displacing birds through disturbance in the short and long term. In areas where activities are ongoing, breeding birds may avoid or abandon habitats to avoid human activities and disturbance. Activities would be limited in time and spatial extent. Project activities would be spread spatially and temporally in the project area (i.e. not all activities will occur at once), so undisturbed habitat would be available for nesting migratory birds in any given year in the project area. Habitat effects would benefit some species, while others would have neutral impacts or experience a decrease in available habitat. Proposed activities would not affect migratory bird populations at the planning unit scale due to the size of the affected area and the availability of untreated habitat in the project area and larger landscape. Design features and sideboards would spread activities temporally and spatially, providing for undisturbed habitat while activities occur and a mosaic of structural stages and stand compositions in affected areas (interspersed created openings, thinned stands, and untreated stands). For these reasons, it is not expected that this project would have a significant impact on individual migratory bird species or the group as a whole.

Randy Scarlett, Wildlife Biologist **March 24, 2022**

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Randy Scarlett **Date**

9 Acronyms

Acronym	Description
BGEPA	Bald and Golden Eagle Protection Act
BMS	Bear Management Subunit
BMU	Bear Management Unit
BO	Biological Opinion
CGNF	Custer Gallatin National Forest
EO	Executive Order
ESA	Endangered Species Act
FP	Forest Plan
FHA	Federal Highways Administration
FS	Forest Service
GBCS	Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area
GNF	Gallatin National Forest
GYE	Greater Yellowstone Ecosystem
HUC	Hydrologic Unit Code
IBMP	Interagency Bison Management Plan
IGBC	Interagency Grizzly Bear Committee
IGBST	Interagency Grizzly Bear Study Team
IMBTA	International Migratory Bird Treaty Act
LAU	Lynx Analysis Unit
MDT	Montana Department of Transportation
MIS	Management Indicator Species
MNHP	Montana Natural Heritage Program
MOU	Memorandum of Understanding
NFMA	National Forest Management Act
NHMRP	North Hebgen Vegetation Management Project
NRLMD	Norther Rockies Lynx Management Direction
OMARD	Open motorized access route density
PFA	Post-fledging Area
R1	Region 1
ROD	Record of Decision
SOC	Species of Concern
TES	Threatened and Endangered Species
TMARD	Total motorized access route density
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
WUI	Wildland Urban Interface
WVC	Wildlife vehicle collision

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11 Figures

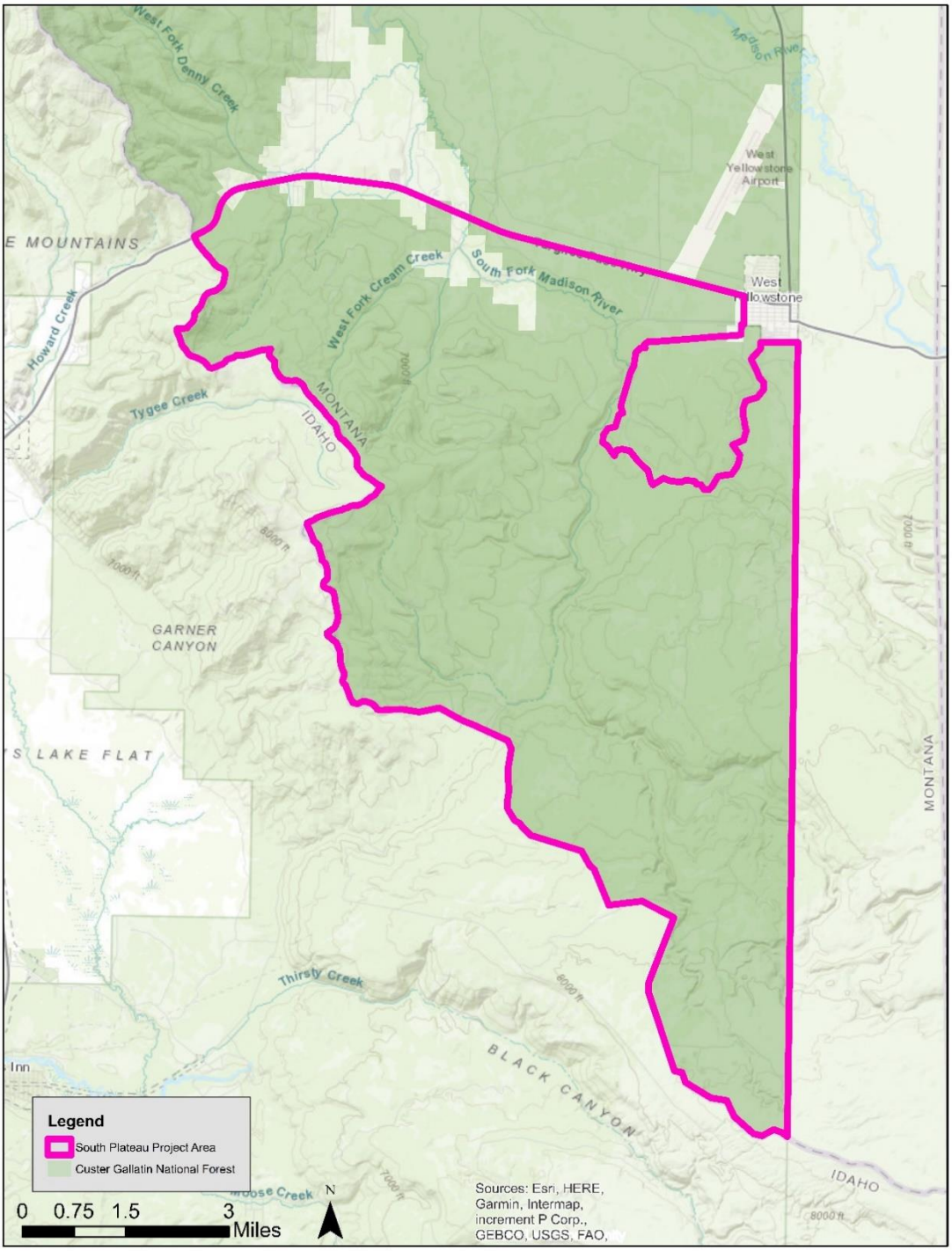

Figure 1: South Plateau Landscape Area Treatment Project Area.

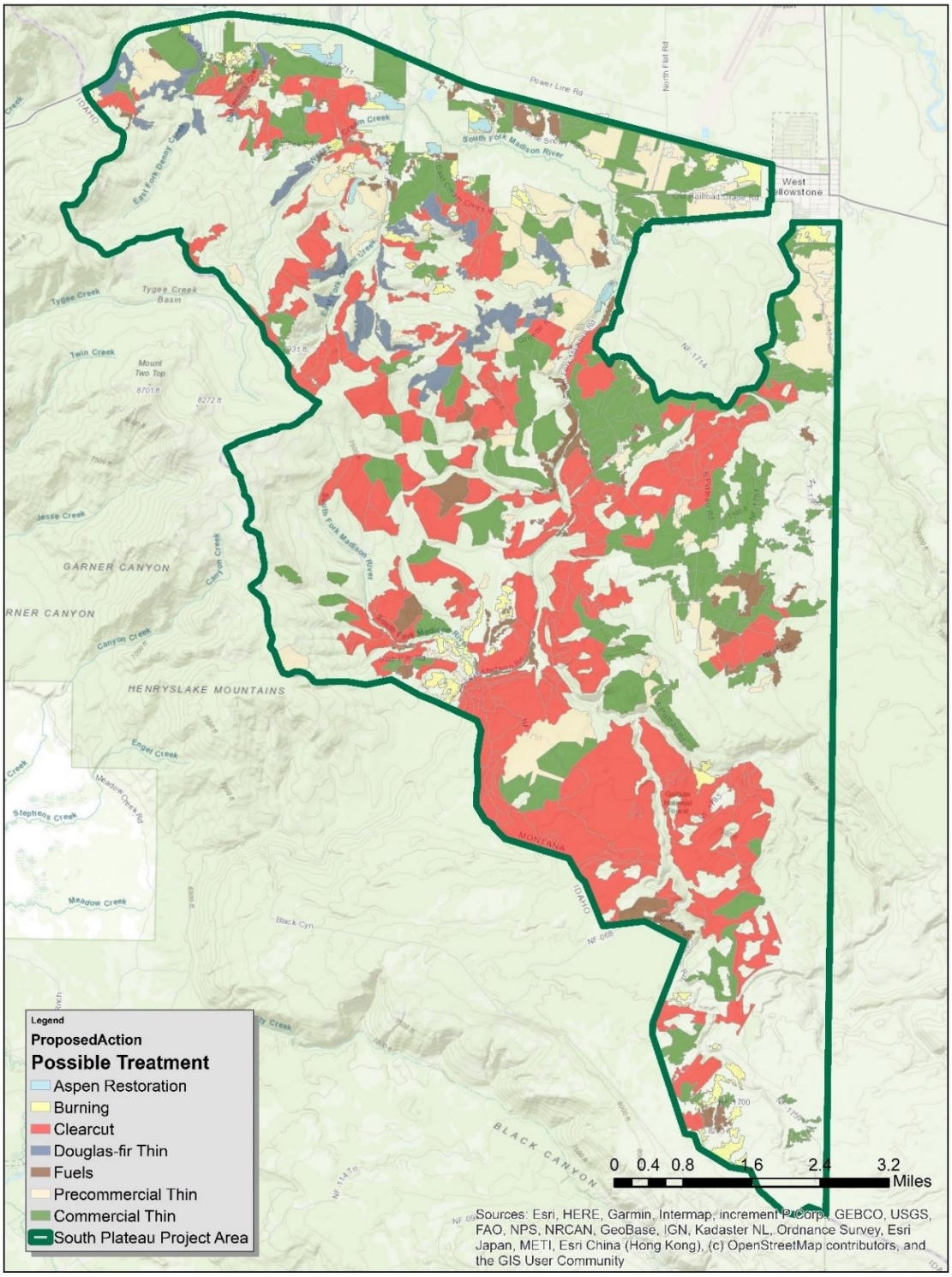

Figure 2: Areas preliminiarily identified as suitable for treatment (also called “stand pool”) and treatment type.

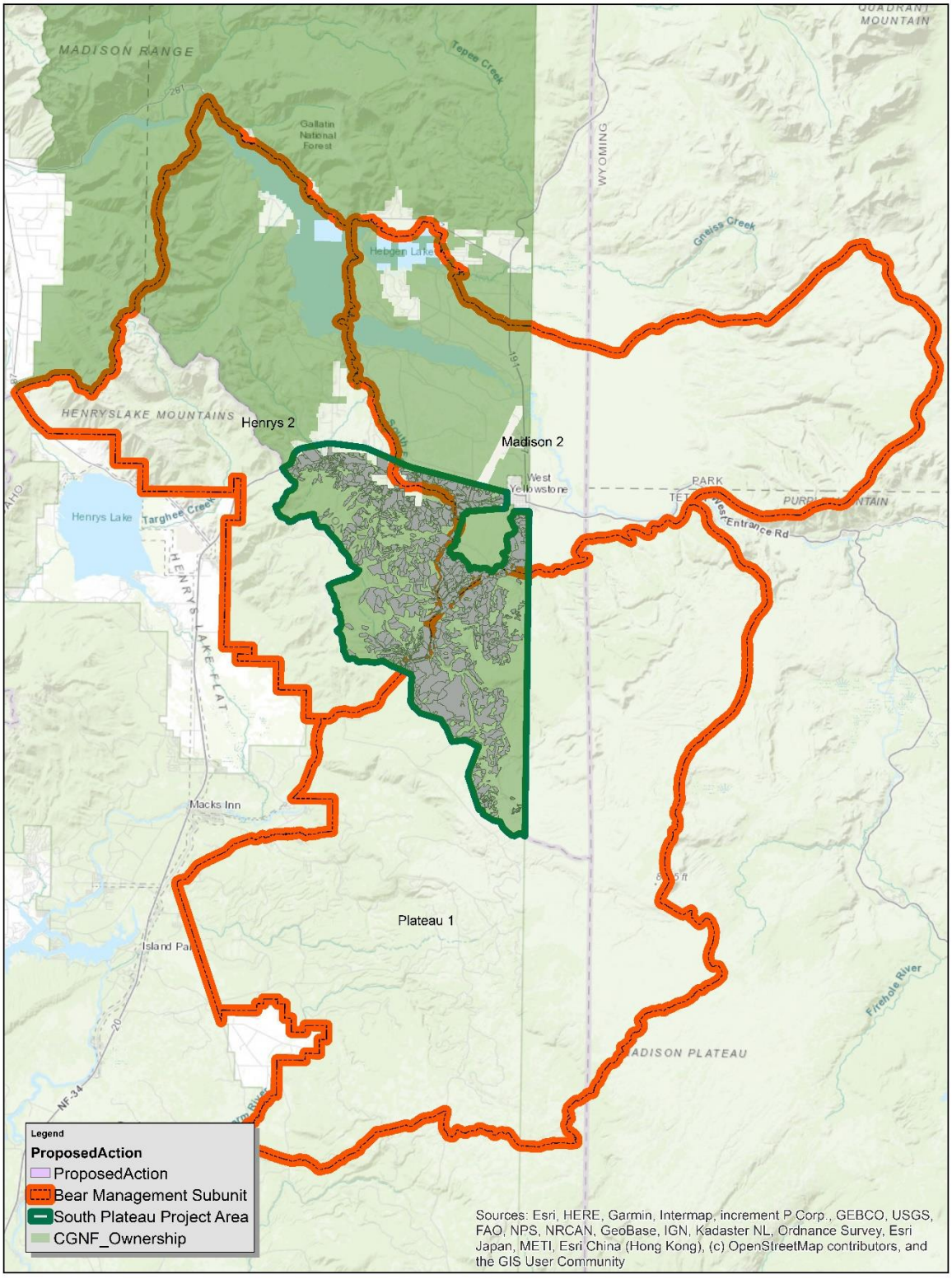

Figure 3: Bear Management Subunits within the South Plateau Project Area.

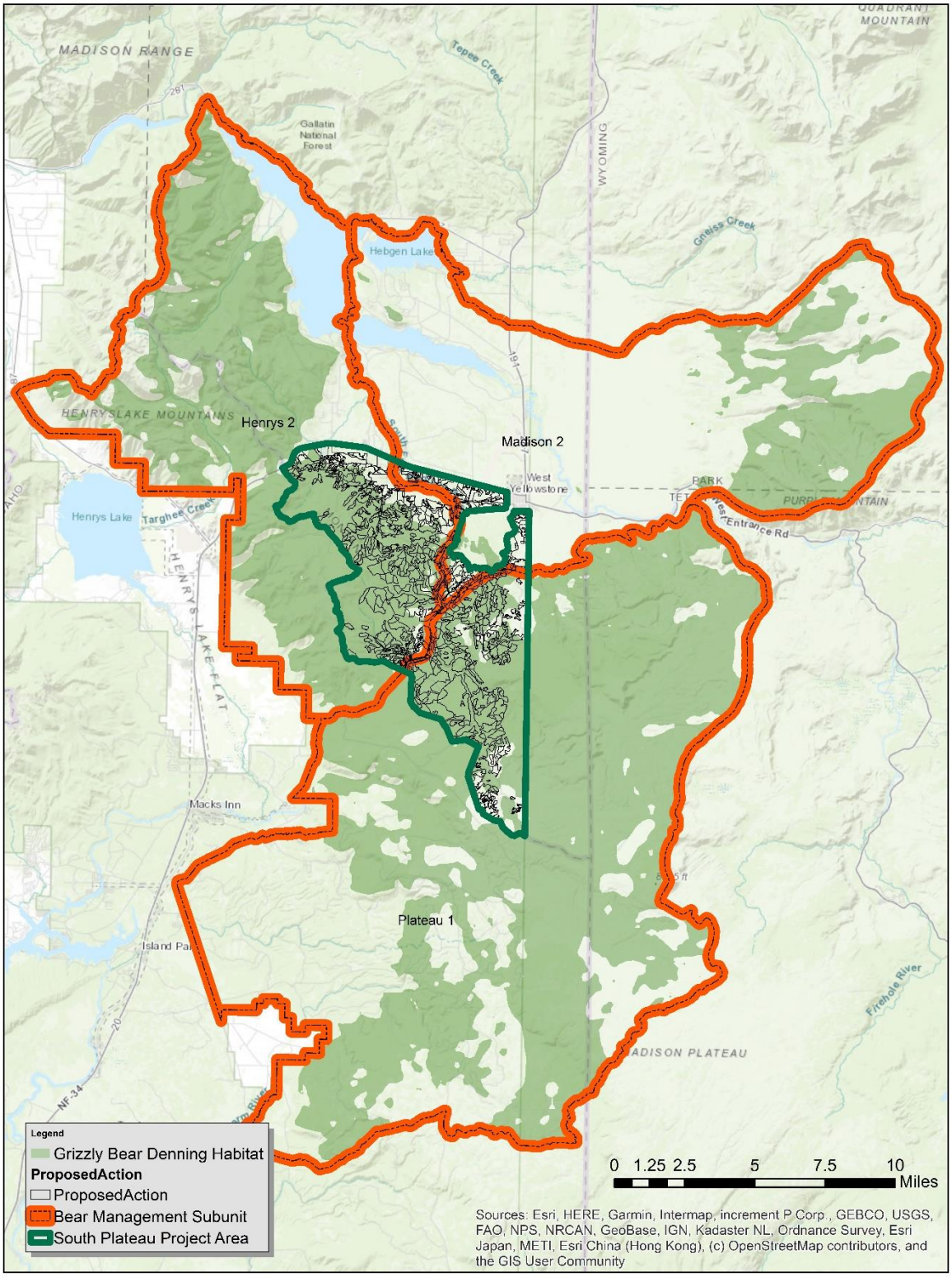

Figure 4: Suitable grizzly bear denning habitat within the three Bear Management Subunits lying within the Project Area.

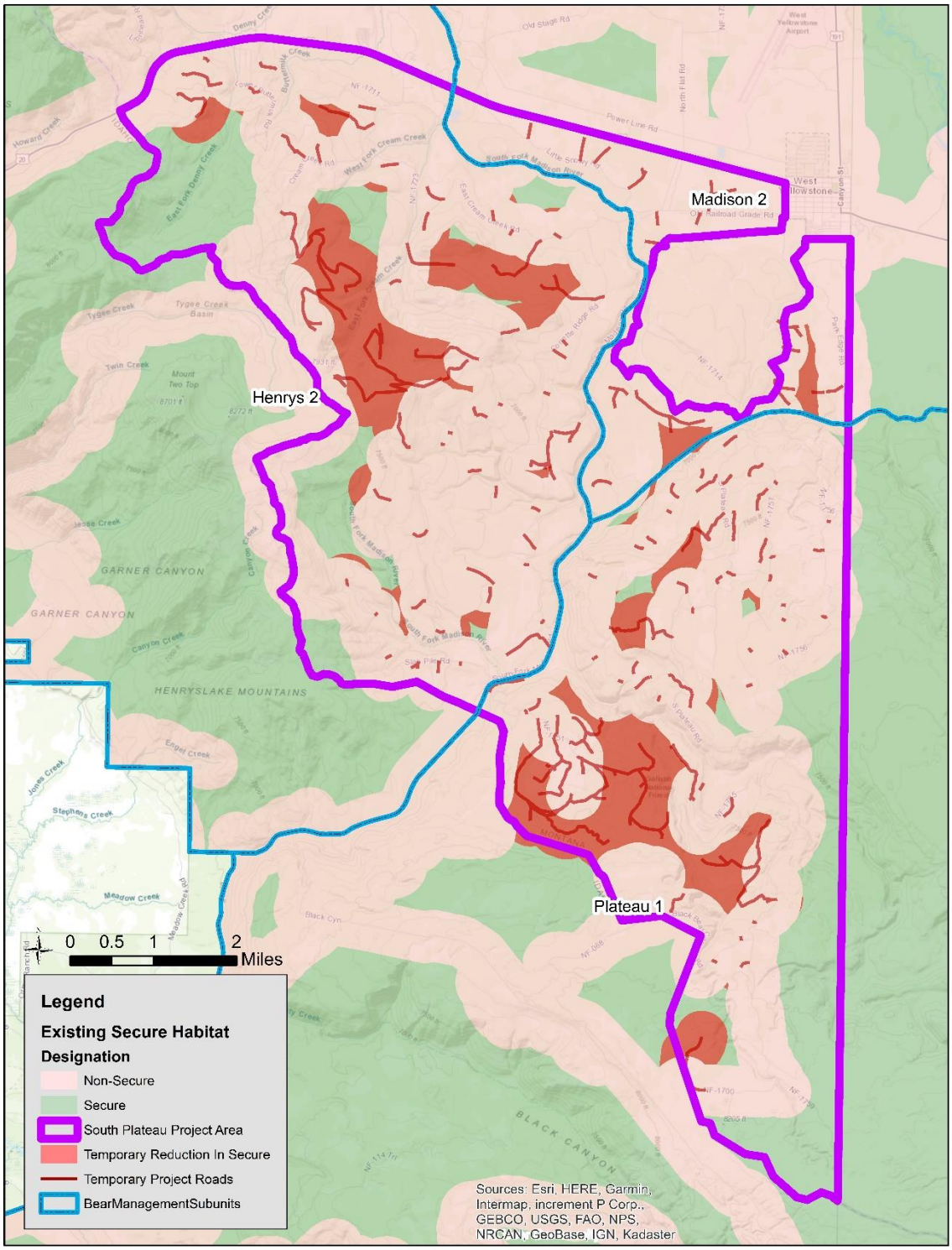

Figure 5: Areas of grizzly bear secure habitat that would be temporarily affected during implementation of the Proposed Action due to construction of temporary project routes. Areas currently defined as secure and non-secure that would be unaffected by implementation are also displayed.

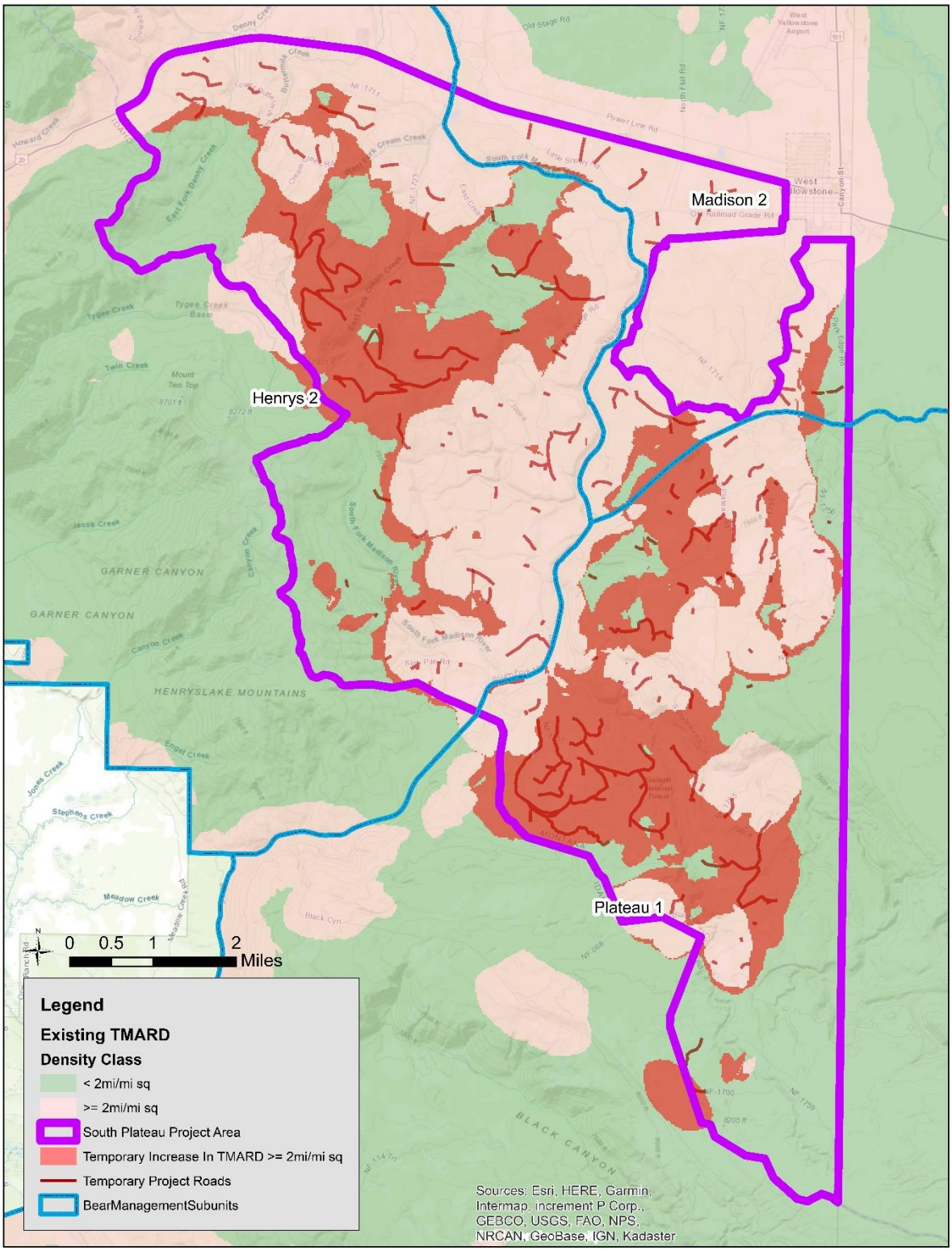

Figure 6: Areas where TMARD would temporarily increase to a level ≥ 2 mi/mi² during implementation of the Proposed Action. Existing TMARD (<2 mi/mi² and ≥2 mi/mi²) is also displayed.

What is the acreage?

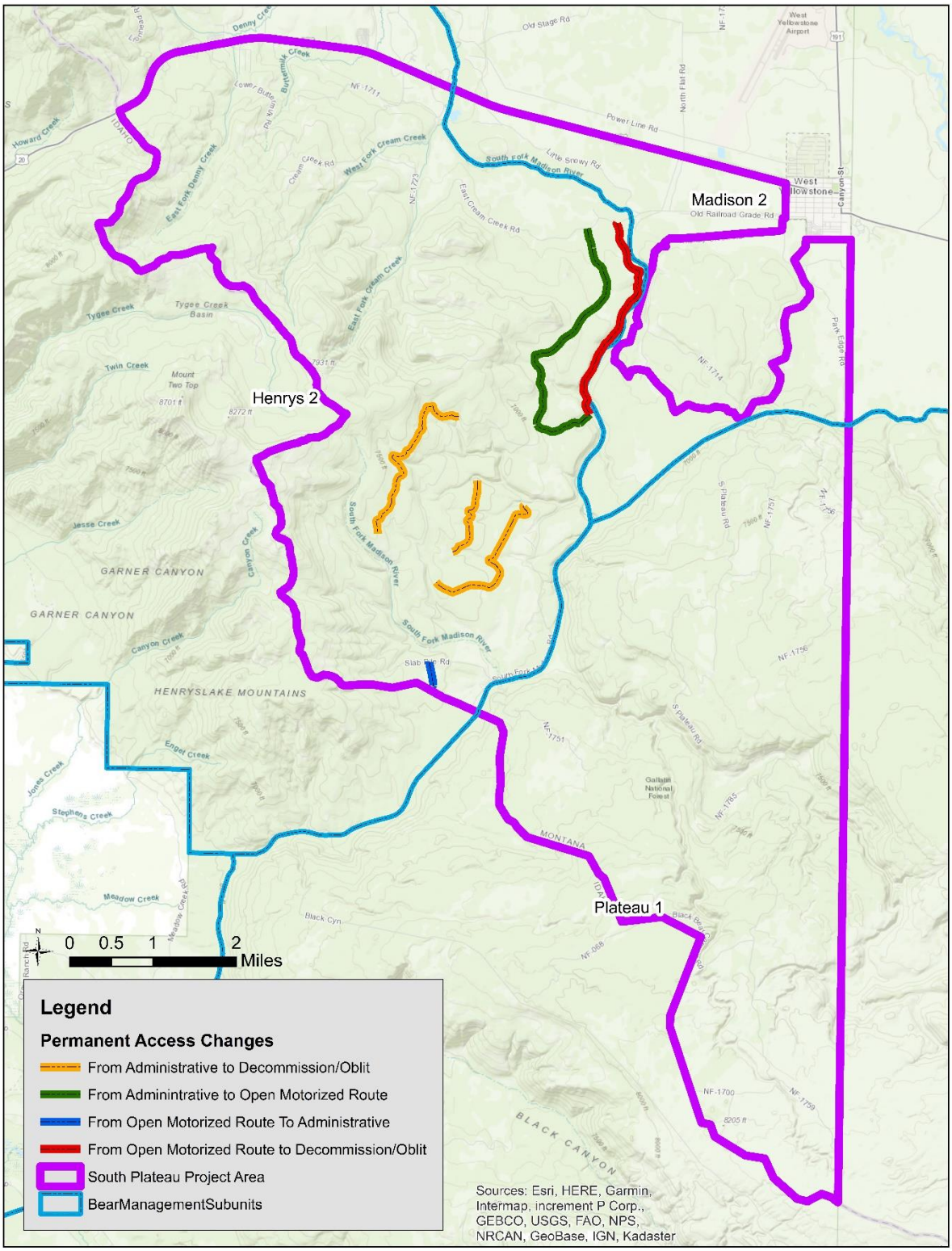

Figure 7: Proposed permanent access changes that pertain to grizzly bear secure habitat in the project area. These changes would be implemented following completion of vegetative treatment activities.

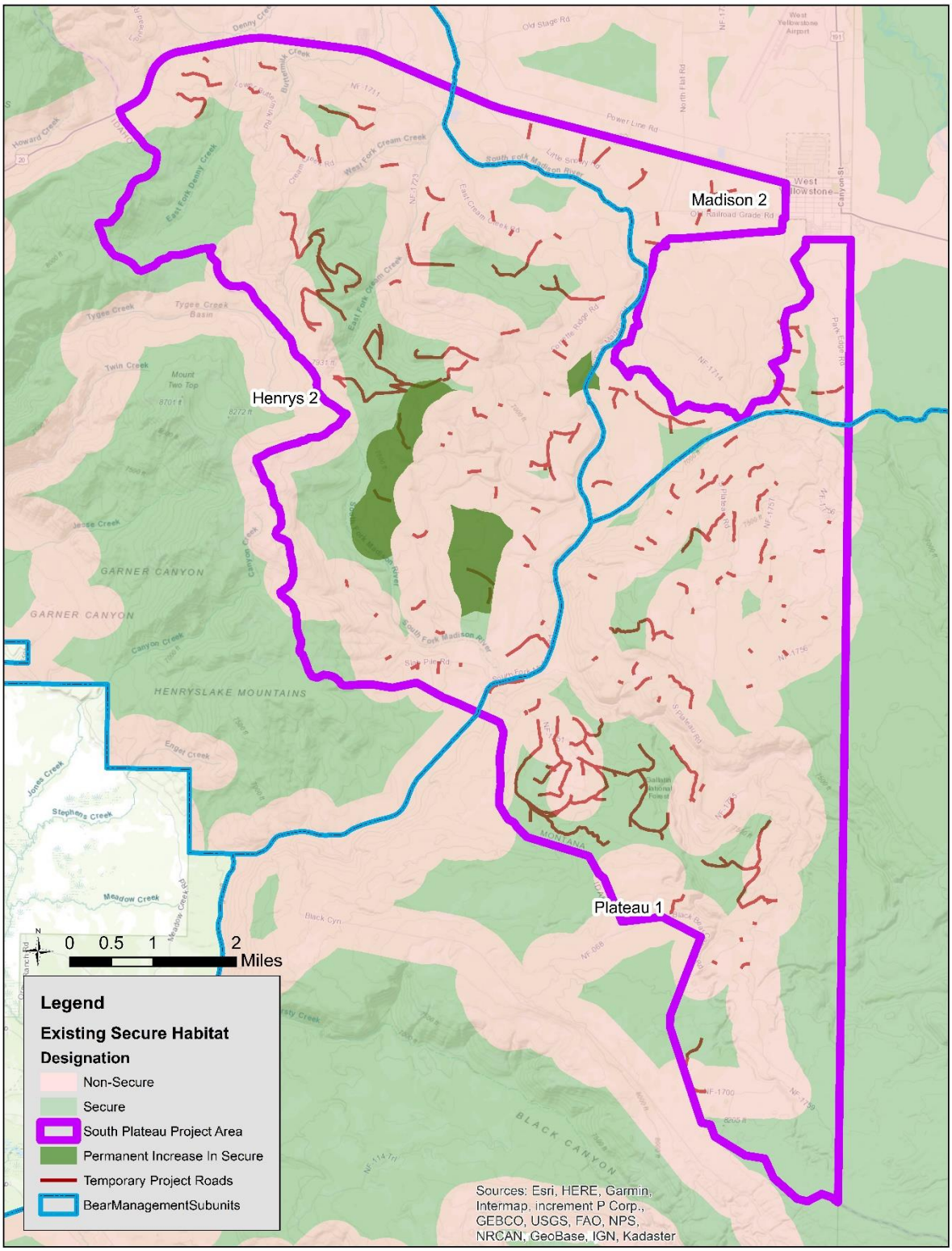

Figure 8: Permanent impacts to grizzly bear Secure Habitat under the Proposed Action that would result from permanent access/route changes.

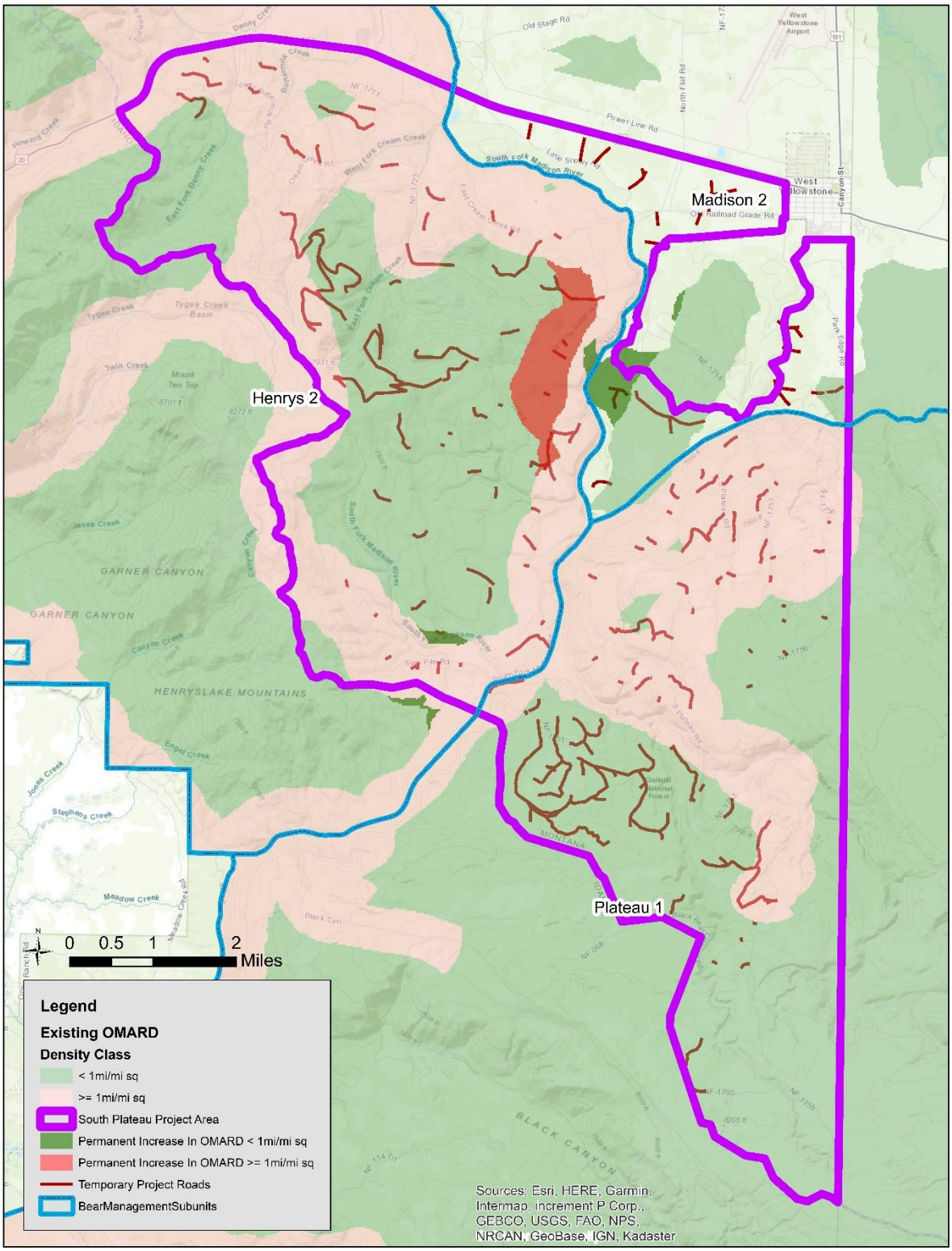

Figure 9: Permanent impacts to OMARD under the Proposed Action that would result from permanent access/route changes.

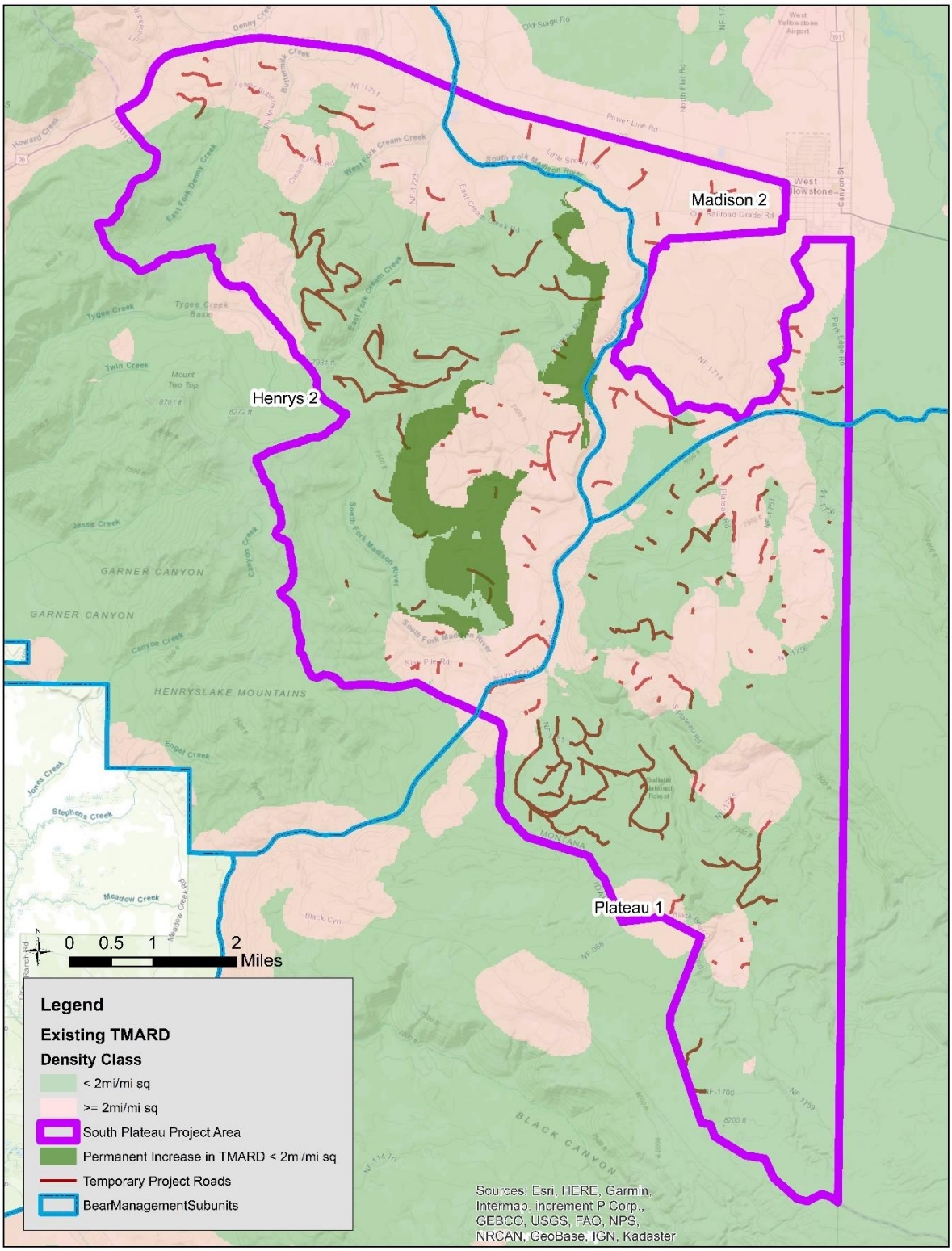

Figure 10: Permanent impacts to TMARD under the Proposed Action that would result from permanent access/route changes.

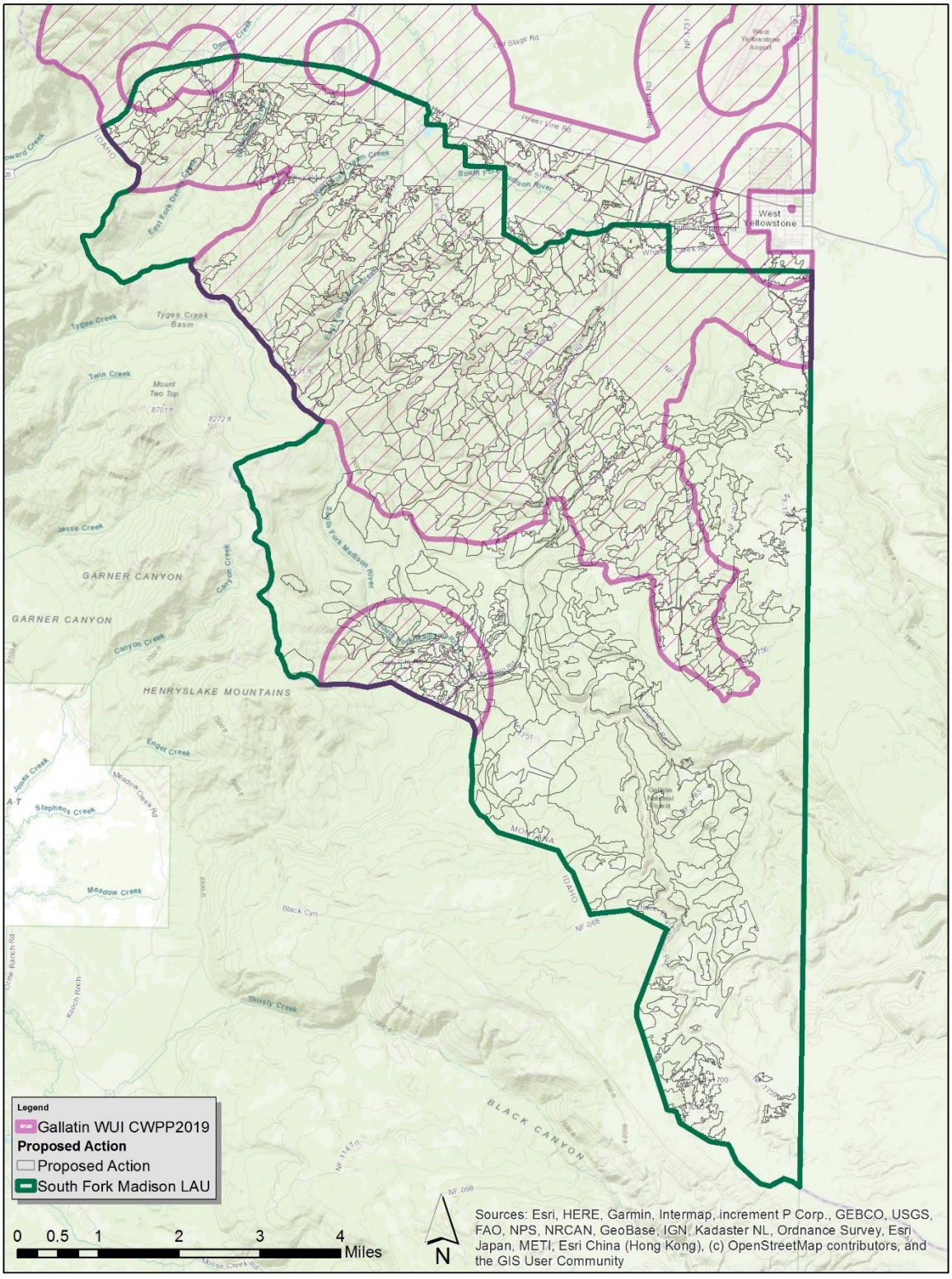

Figure 11: Gallatin County CWPP Wildland Urban Interface (WUI) in relation to proposed treatment units in the South Plateau Project Area.

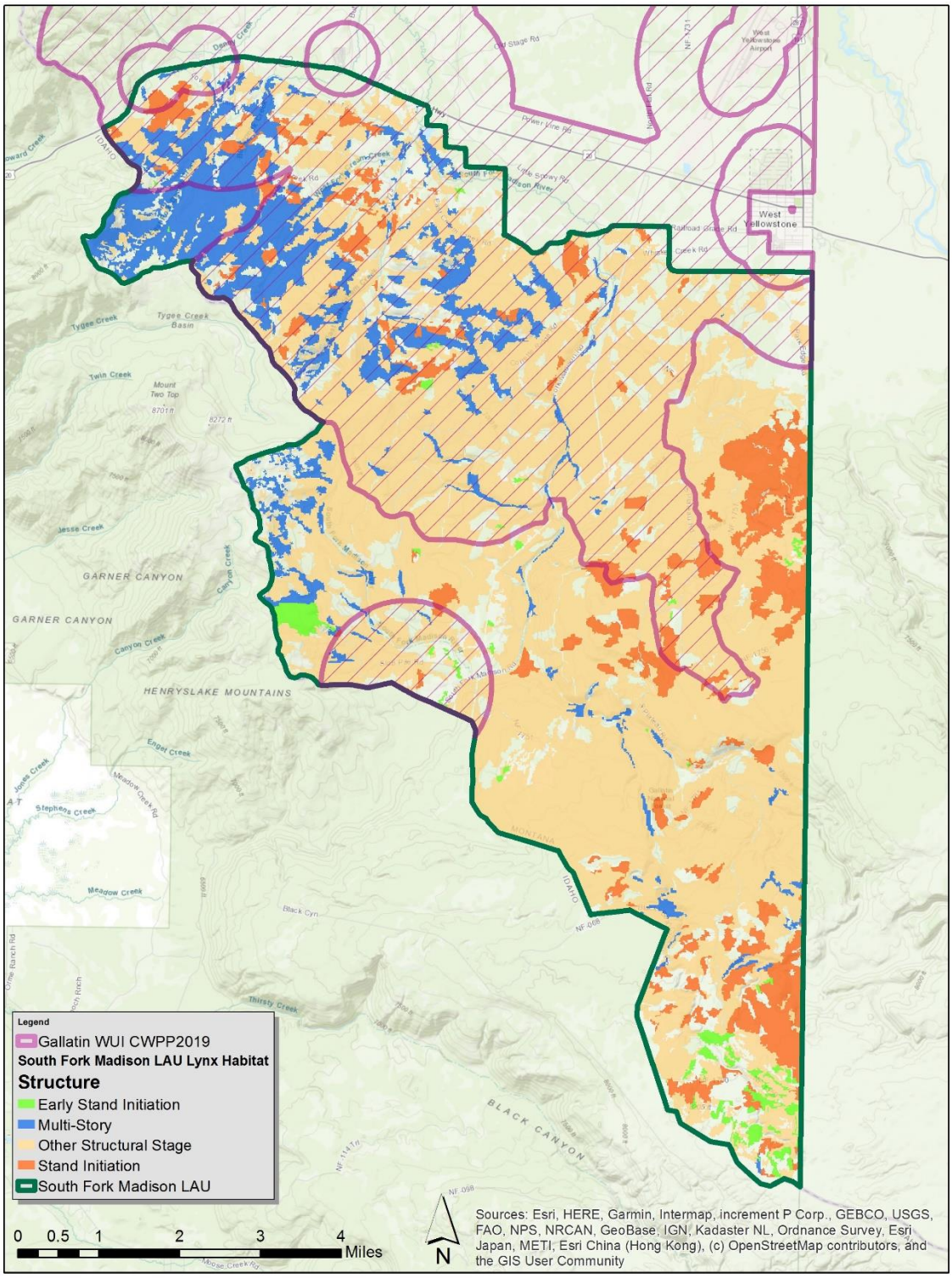

Figure 12: Lynx habitat in the South Fork Madison Lynx Analysis Unit.

This map demonstrates that not the entire project area is lynx habitat, so more than 4,600 acres can be clearcut.

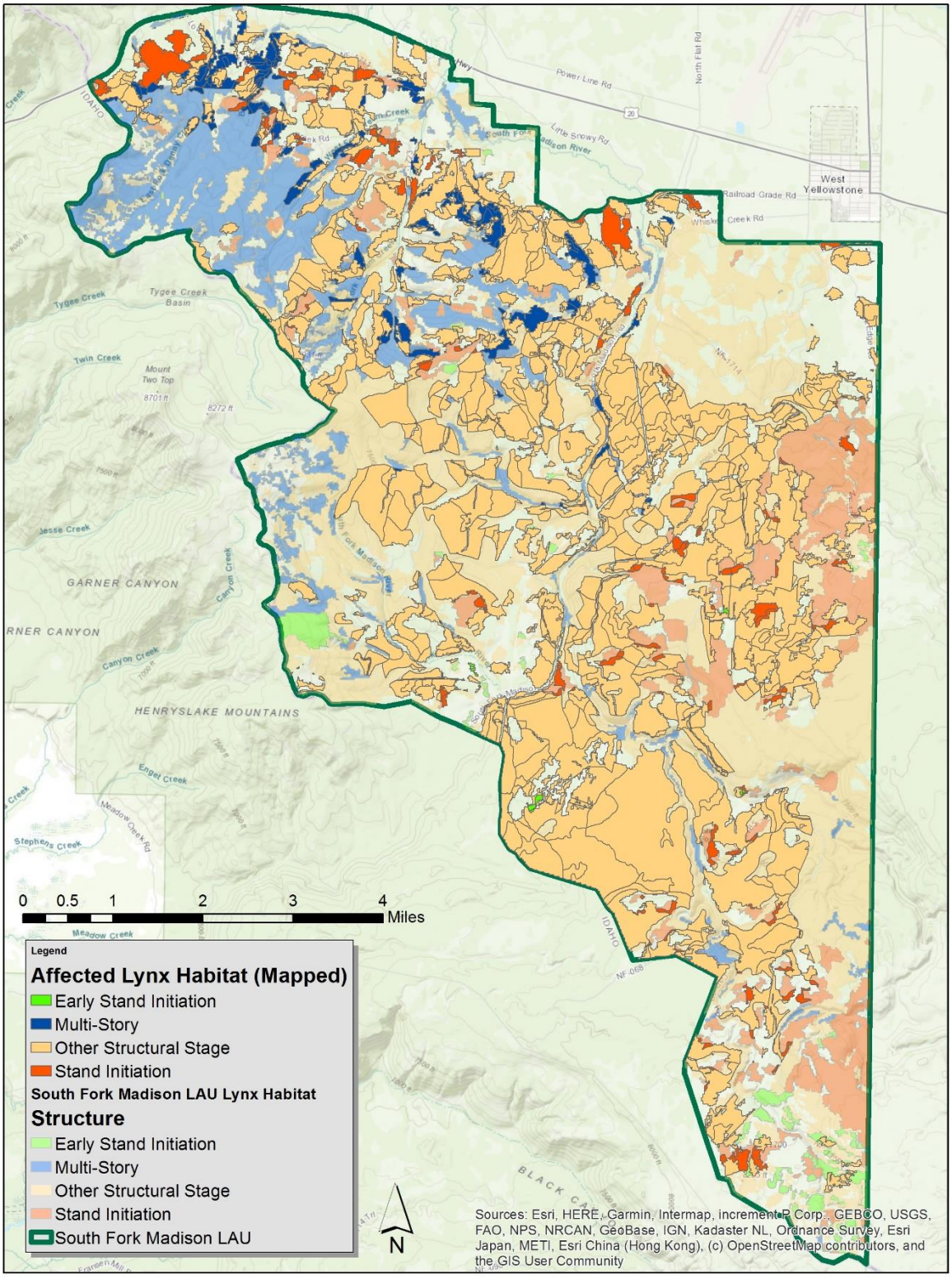

Figure 13: Affected lynx habitat under the Proposed Action.

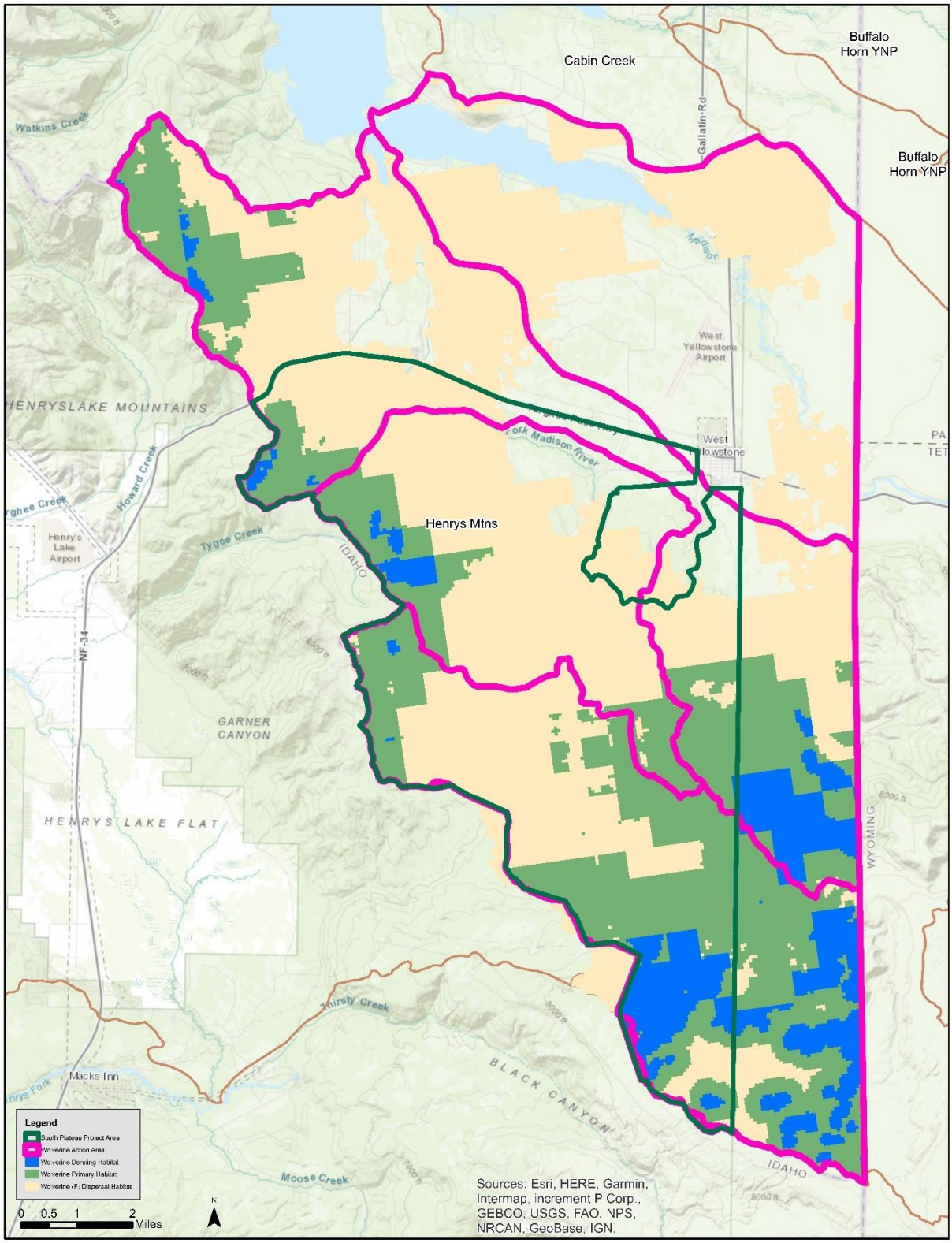

Figure 14: Analysis area and existing habitat for the North American Wolverine.

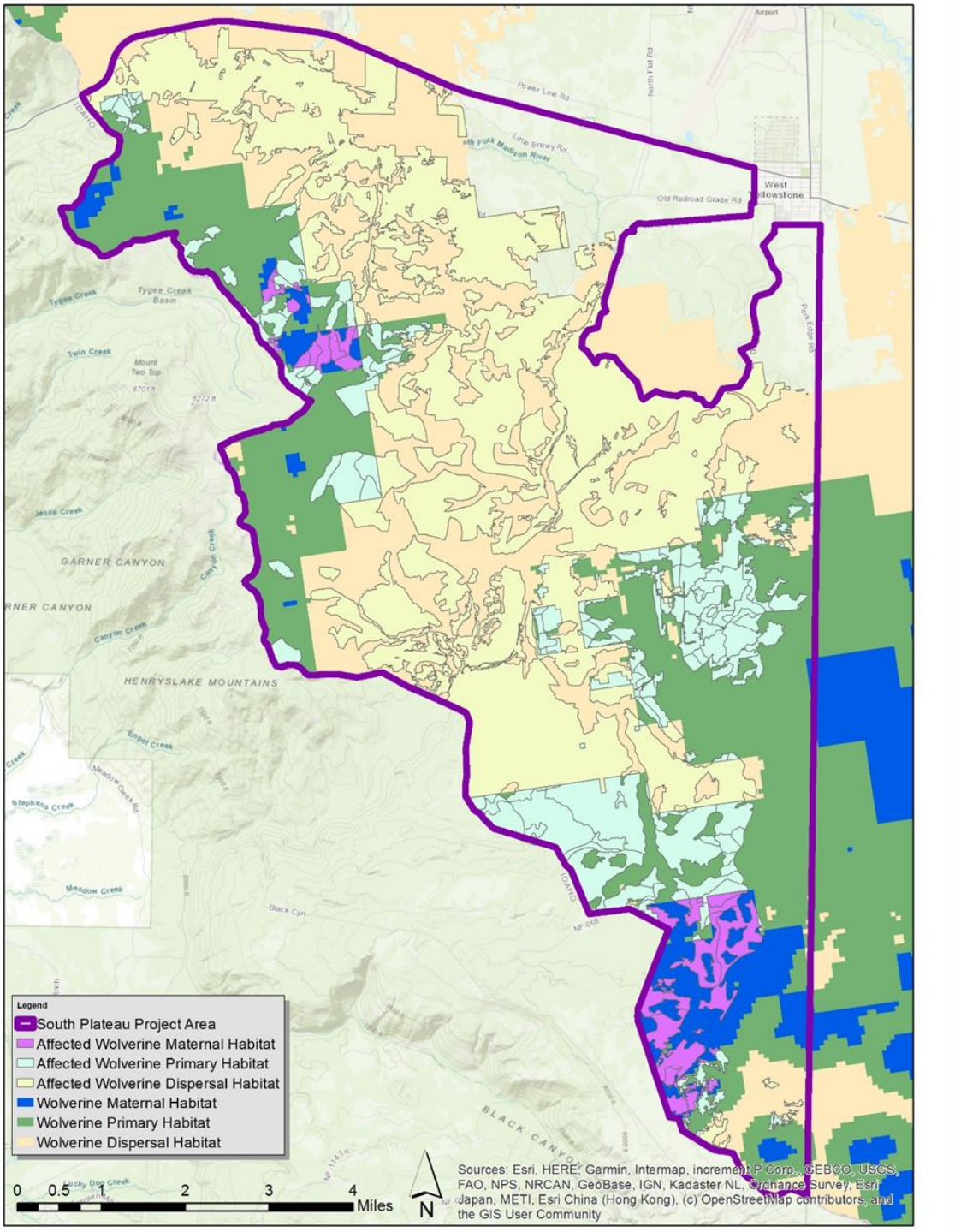

Figure 15: Effects of the Proposed Action on Wolverine Maternal, Primary, and Dispersal Habitat under the Proposed Action.

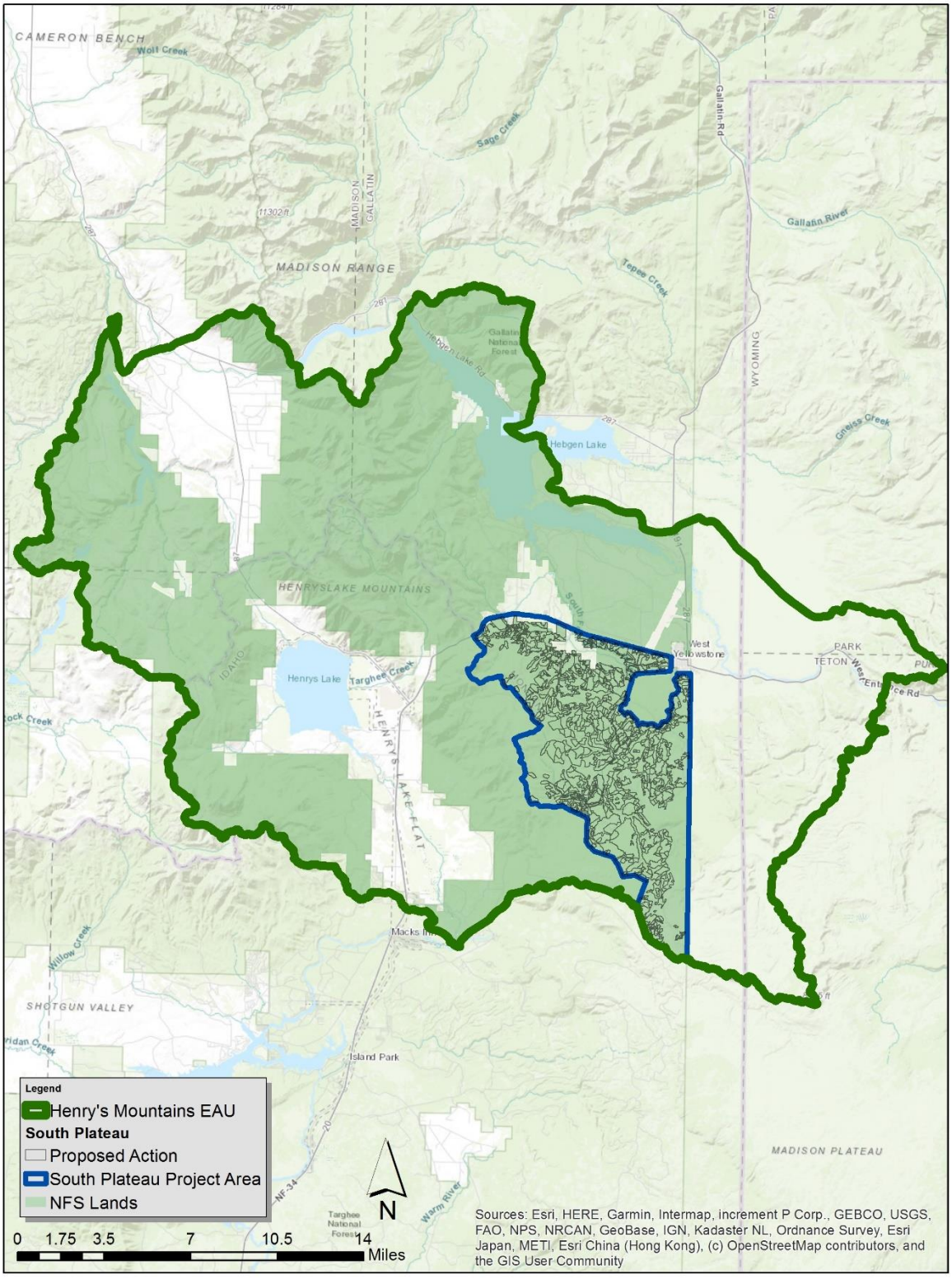

Figure 16: The Henry's Mountains Elk Analysis Unit in relation to the South Plateau Project Area.

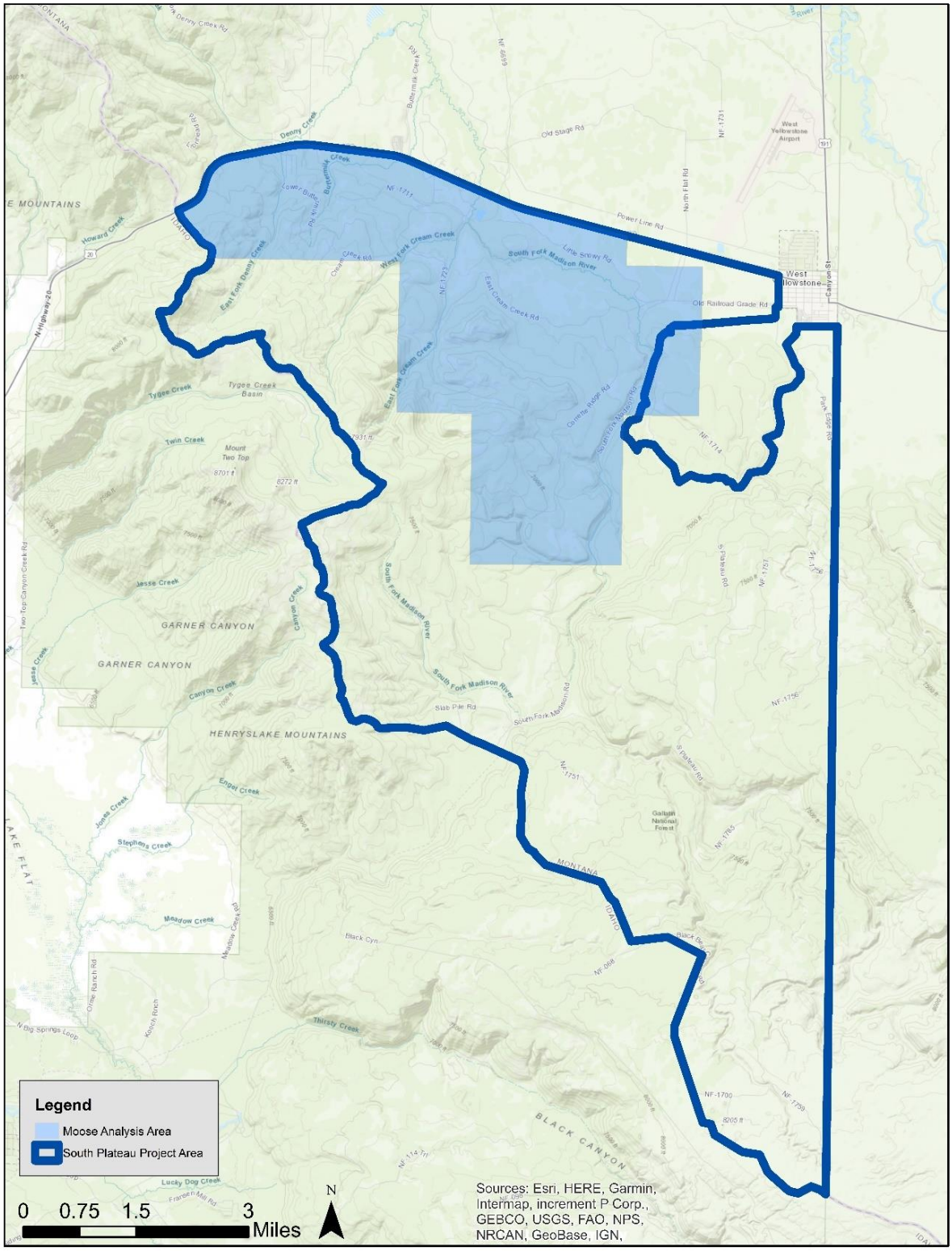

Figure 17: Moose Analysis Area.

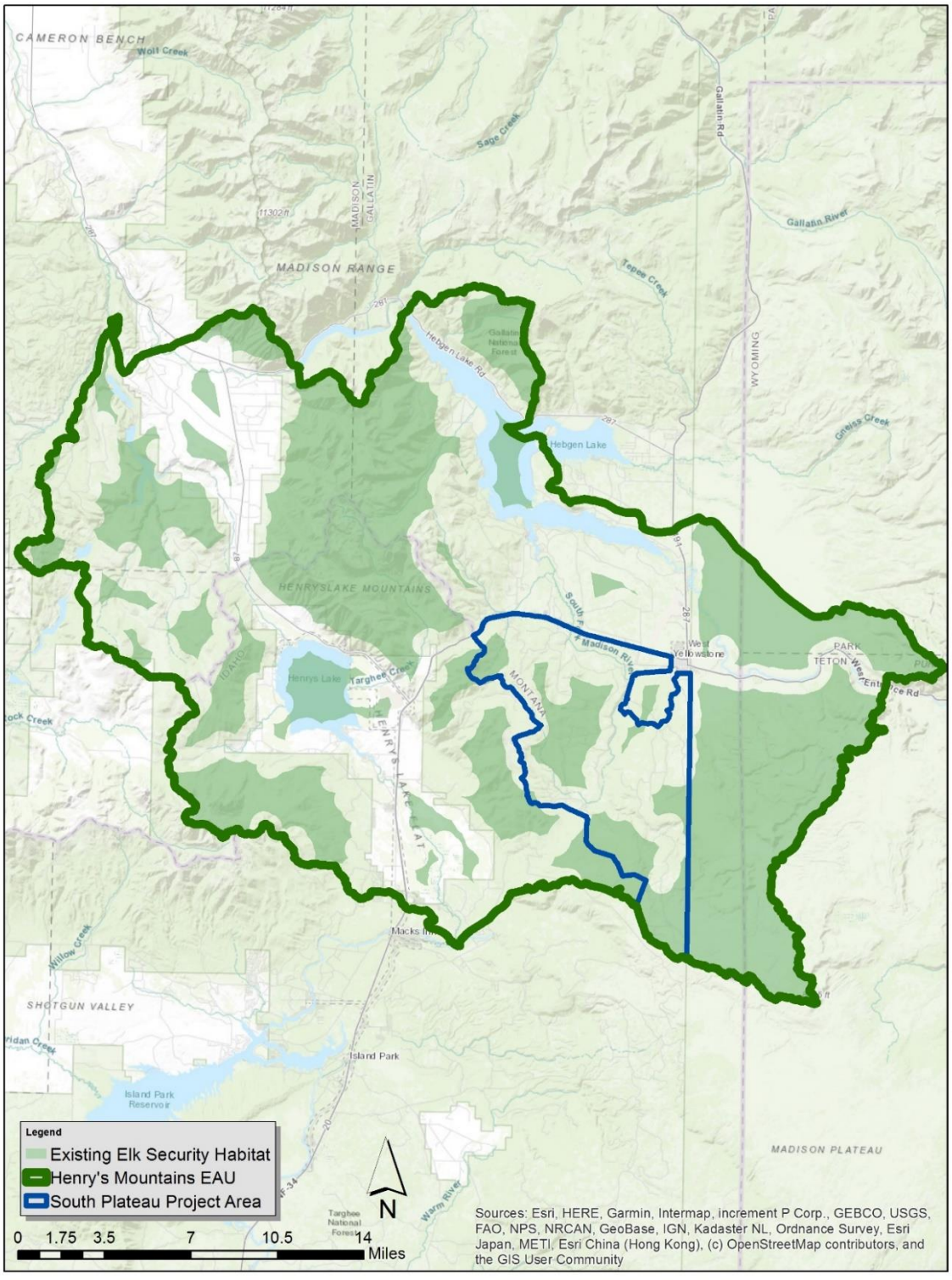

Figure 18: Existing Security Areas in the Henry's Mountains EAU.

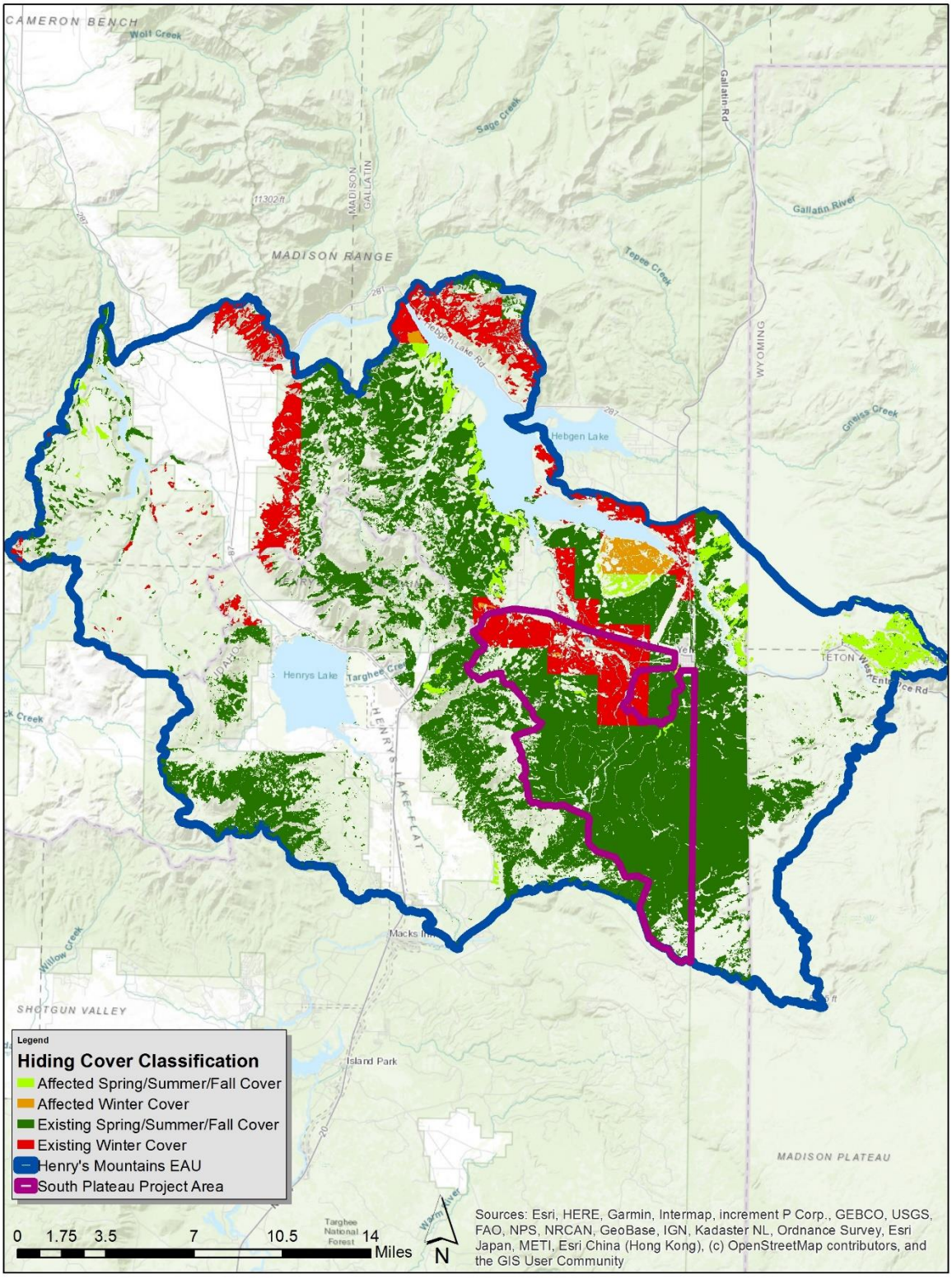

Figure 19: Hiding Cover (Affected and Existing) in the Henry's Mountains EAU.

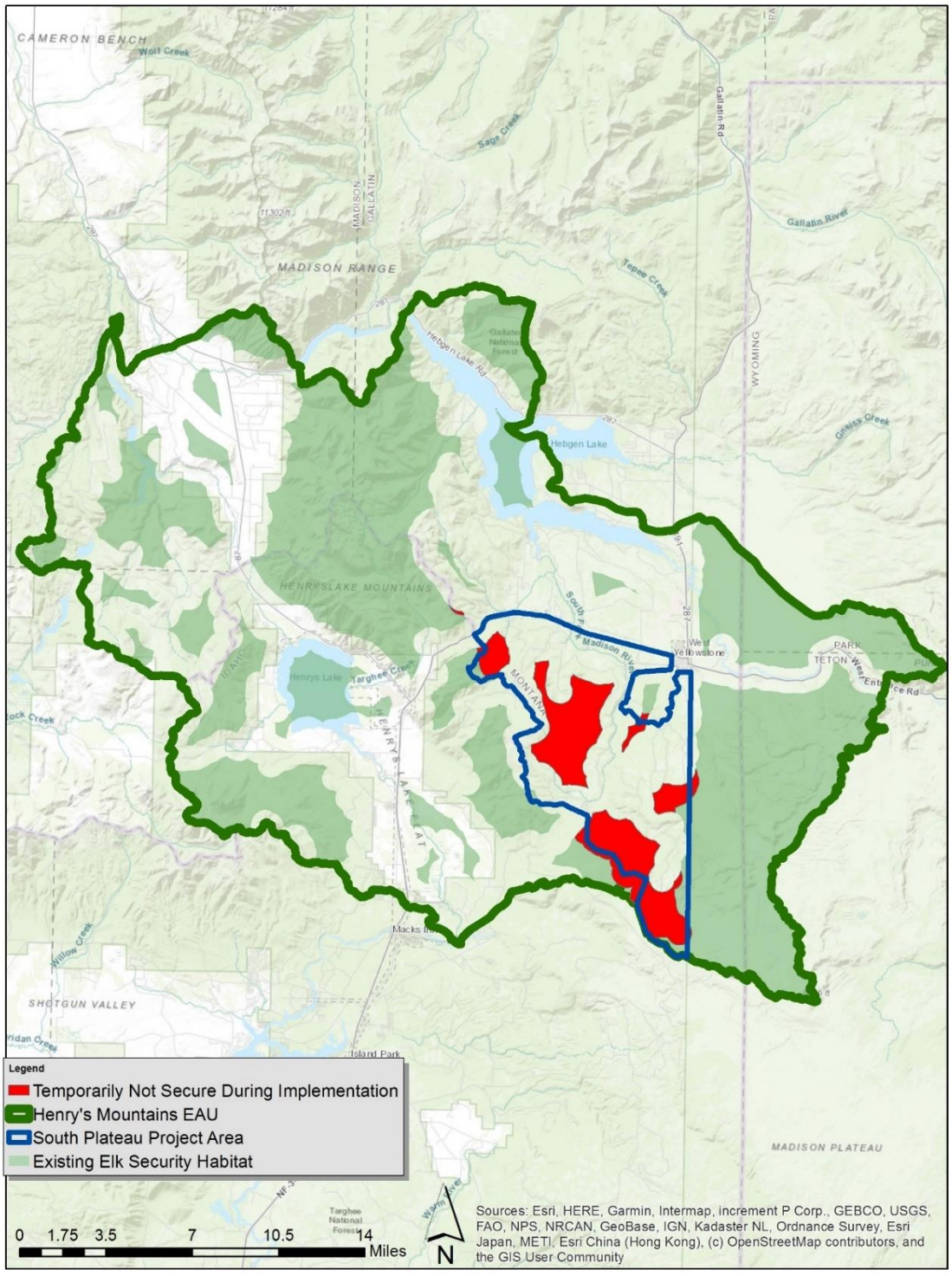

Figure 20: Effects of the Proposed Action on Elk Security Areas. The temporary change in the proportion of the EAU providing Security Areas would cease and would return to the existing condition once vegetative treatment activities are complete and temporary roads are decommissioned.

Project would virtually eliminate security areas in the project area.

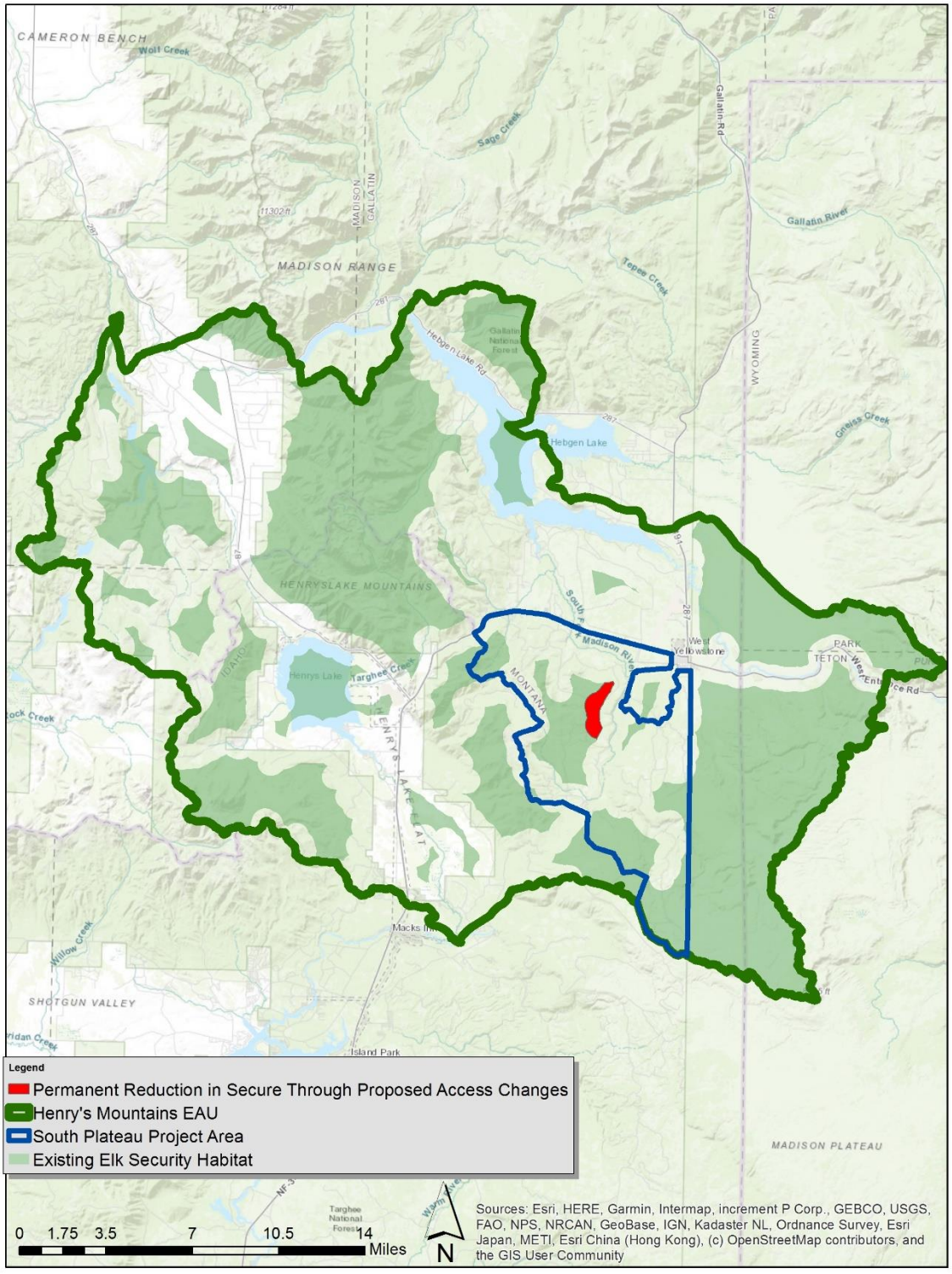

Figure 21: Permanent effects of the proposed access changes (to be implemented once vegetative treatment and associated temporary roads are decommissioned) on elk Security Areas in the EAU.

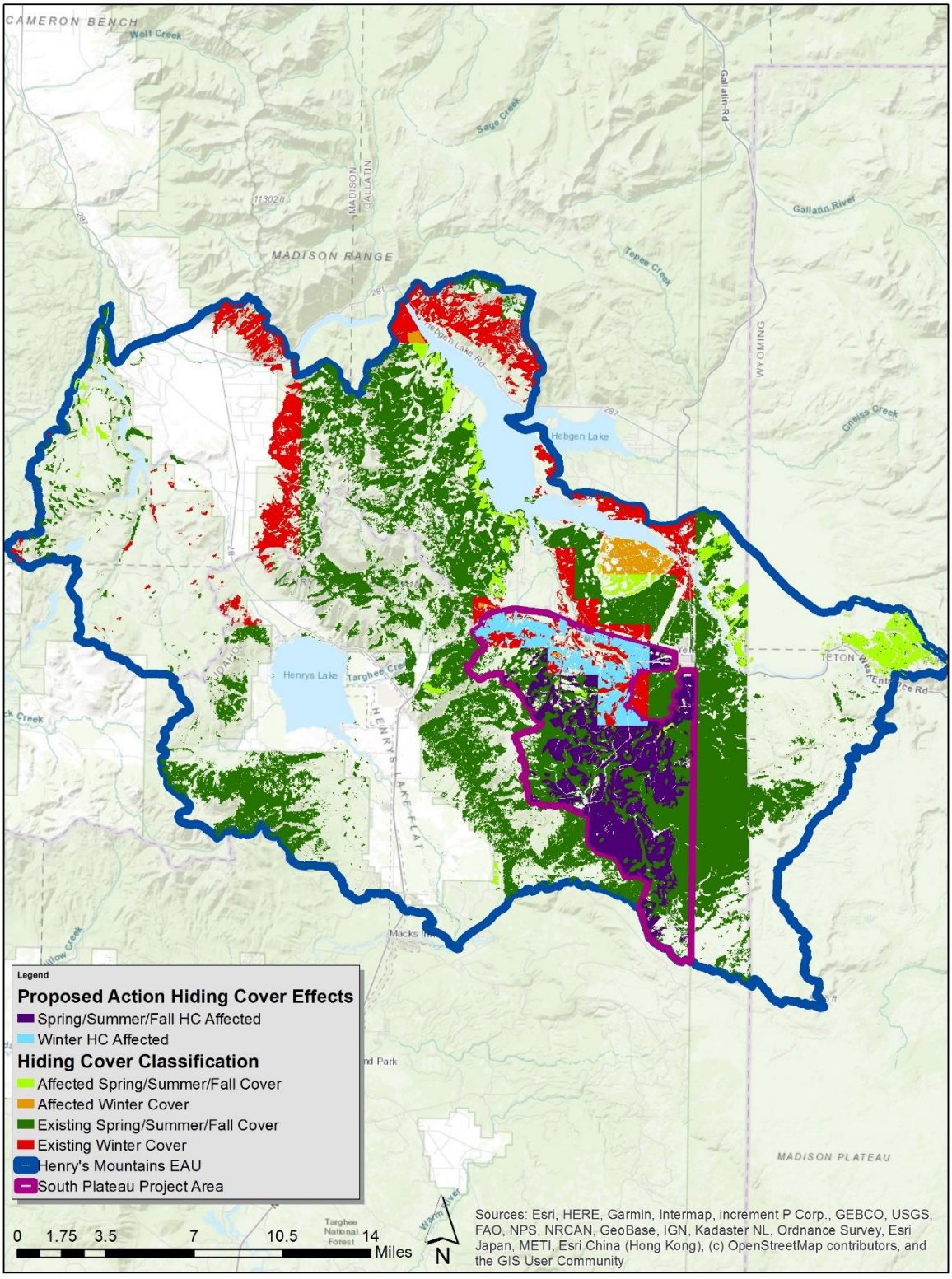

Figure 22: Effect on Hiding Cover under the Proposed Action for the Henry's Mountains EAU.

Hiding cover for elk degraded over a significant portion of the area.