

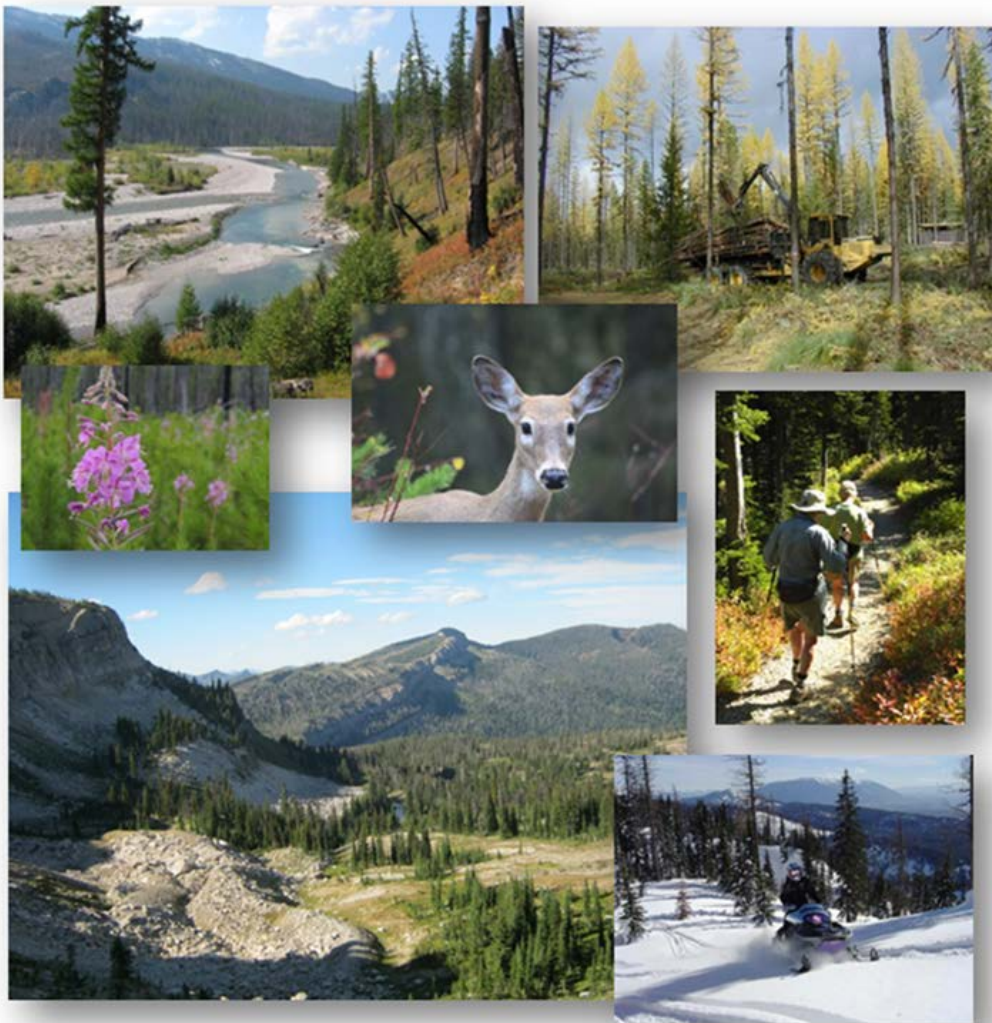


Department of Agriculture

Final Environmental Impact Statement for the Forest Plan

Flathead National Forest

Volume 4: Appendices and Glossary



Forest Service

Northern Region

December 2017

"... for the greatest good of the greatest number for the longest time." Gifford Pinchot, founding Chief of the Forest Service, 1905

Flathead National Forest photo captions (clockwise from upper left):

- South Fork of the Flathead River, Spotted Bear Ranger District
- Forwarder working on the Paint Emery Resource Management Project, Hungry Horse–Glacier View Ranger District
- Two hikers
- Snowmobiler
- View from trail to Pentagon Cabin in the Bob Marshall Wilderness (photo by Peter Borgesen)
- Fireweed
- White-tailed deer (photo by John Littlefield)

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Final Environmental Impact Statement for the Revised Land Management Plan

Flathead National Forest

Volume 4: Appendices and Glossary

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Abstract: This is the volume 4 of the final environmental impact statement (EIS) that documents the analysis of four alternatives developed for programmatic management of the 2.4 million acres administered by the Flathead National Forest. The Forest Service has identified alternative B modified as the preferred alternative.

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Terms and Abbreviations

Term	Full name
1986 forest plan	Flathead National Forest Land and Resource Management Plan (1986)
2012 planning rule	National Forest System land management planning rule (effective 2012)
assessment	assessment of the Flathead National Forest
amendment forests	collective term for the Helena-Lewis and Clark, Kootenai, and Lolo National Forests
draft Grizzly Bear Conservation Strategy	Draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013)
the Forest	Flathead National Forest
forest plan	Flathead National Forest Revised Land Management Plan
Northern Region	USDA Forest Service Northern Region (also known as Region 1)

List of Abbreviations

CFR	Code of Federal Regulations
d.b.h.	diameter at breast height
DC	desired condition (forest plan component)
DCA	demographic connectivity area
EIS	environmental impact statement
FW	forestwide (forest plan component)
GA	geographic area
GDL	Guideline (forest plan component)
GIS	geographic information system
INFISH	Inland Native Fish Strategy
MA	management area
mi	mile
mmbf	million board feet
mmcf	million cubic feet
MFWP	Montana Fish Wildlife and Parks
NCDE	Northern Continental Divide Ecosystem
NEPA	National Environmental Policy Act
NFS	National Forest System
NRLMD	Northern Rockies Lynx Management Direction
PACFISH	Pacific Fish Strategy
PCA	primary conservation area
PIBO	PACFISH/INFISH Biological Opinion
STD	standard (forest plan component)
TMDL	total maximum daily load
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

Appendix 1: Maps

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Introduction

The basic analytical framework for the revision of the forest plan for the Flathead National Forest (hereinafter referred to as the “Forest”) is prescribed by the National Environmental Policy Act (NEPA) process. A set of alternative scenarios related to vegetation and timber harvest, representing different approaches to the identified issues and needs for change, was simulated over time by the use of vegetation models to provide information to compare and contrast the alternatives in terms of their ability to achieve the desired conditions for vegetation. The analysis of the vegetation conditions and timber outputs of the alternatives included development of desired conditions, identification of lands suitable for timber production, and evaluation of movement towards vegetation desired conditions and associated timber harvest levels. This appendix describes the analytical methods and tools used to do the analysis supporting the comparison of alternatives and summarizes the results.

Data and Information Sources for Vegetation Analyses

A variety of well-researched, well-documented, and well-accepted datasets and tools have been used in the development of the models used for the terrestrial vegetation analysis. They collectively make up the current best available science for quantifying vegetation conditions. The primary databases and information sources used in the vegetation analysis process are briefly summarized below. Detailed information about these data sources can be found in Trechsel (2016b).

Forest Inventory and Analysis

Forest Inventory and Analysis data consists of a set of points established on a nationwide systematic grid across all ownerships and regardless of management emphasis. The sample design and data collection methods are scientifically designed, publicly disclosed, and repeatable. For purposes of describing existing vegetation information for broad-scale analyses, it is infeasible to maintain a field inventory on every acre of a large analysis unit such as the 2.4 million acres of the Forest. The Forest Inventory and Analysis plots provide a systematic, spatially balanced, statistically reliable inventory using national protocols appropriate for providing unbiased estimates of forest conditions for use at broad scales of analysis. Plots are remeasured on a 10-year cycle, allowing evaluation of trends in forest conditions over time. For more detailed information on Forest Inventory and Analysis, refer to the work of Bush and Reyes (2014), Czaplewski (2004), and the Interior West Forest Inventory and Analysis Program website (<http://www.fs.fed.us/rm/ogden/index.shtml>).

Region Vegetation Map (VMap)

The USDA Forest Service Northern Region, also referred to as Region 1, Vegetation Map (VMap) is a spatially explicit (mapped), polygon-based product derived from remotely sensed data that contains information about the extent, composition, and structure of vegetation across National Forest System (NFS) lands in the Northern Region. The VMap database provides four primary map products; lifeform, tree canopy cover class, tree size class, and tree dominance type. Satellite imagery and airborne-acquired imagery are used to develop the database and are refined through field sampling and verification. The VMap was designed to allow consistent, continuous applications between regional inventory and map products and across all land ownerships with sufficient accuracy and precision. An independent accuracy assessment was conducted to provide a validation of the data, giving an indication of the reliability of the map products (Brown, 2012). Refer to Region 1 *Multi-level Vegetation Classification, Mapping, Inventory and Analysis System* (Barber, Berglund, & Bush, 2009) and other publications (Ahl & Brown, 2012; Barber, Bush, & Berglund, 2011) for an overview of the map unit design, the process used to develop the layers, and a detailed description of VMap vegetative data.

Flathead National Forest Geographic Information System

The Flathead National Forest has a library of geographic information system (GIS) data for the Forest. The library includes a large number of mapped data layers with associated metadata. Primary layers referenced for the vegetation analysis include vegetation data layers (VMap), fire history, fire start history, timber harvest history, insect and disease aerial detection survey data, grizzly bear habitat, lynx habitat layers, roads, topographical features such as elevation and slope, and administrative-related boundary layers (e.g., ownership, inventoried roadless areas, wilderness areas, wildland-urban interface). The link to Flathead National Forest geospatial data can be found on the Forest's web page (<http://www.fs.usda.gov/flathead>).

Many summaries and assessments of vegetation condition were developed using GIS, which is both an analysis tool and a display technology, meaning it can be used both to track information and to display it in a variety of graphic formats. As explained later, the GIS tool was used in determining timber suitability. It was also used to build the acre summaries needed for Spectrum analysis areas and spatial data for the SIMPPLLE model.

Potential Vegetation Types

Potential vegetation types are mapping units delineating areas that have similar biophysical environments (e.g., climate and soil characteristics) that produce plant communities of similar composition, structure, and function. The USDA Forest Service Northern Region has identified potential vegetation groups (broad- and mid-level groupings of habitat types) that are recommended for use at the broad levels to provide consistent analysis and monitoring, as described by Milburn and others (Milburn, Bollenbacher, Manning, & Bush, 2015) in the publication *Region 1 Existing and Potential Vegetation Groupings used for Broad-Level Analysis and Monitoring*. Four coniferous forest potential vegetation types are found on the Flathead: warm-dry, warm-moist, cool-moist, and cold. Refer to appendix D of the forest plan for a cross-reference of habitat types and other vegetation classifications to the potential vegetation types used in the forest plan.

Potential vegetation types serve as a basis for describing certain ecological conditions across the Forest and are useful in understanding the various ecosystems on the Forest and their potential productivity and natural biodiversity, as well as the kinds of processes that sustain these conditions. They provide an understanding of the potential vegetation conditions that might occur over time on a particular site.

Vegetation Models

The vegetation management strategy for the Flathead is to manage the landscape to maintain or trend towards the desired conditions for vegetation. Modeling changes in vegetation over time and evaluation of movement towards desired conditions has been accomplished using the following set of analytical tools and models:

- Forest Vegetation Simulation—This forest growth simulation model was used to estimate timber growth and yield.
- Spectrum—This model was used to project alternative resource management scenarios and to schedule vegetation treatments in response to vegetative desired conditions.
- SIMulating Patterns and Processes at Landscape scaLEs (SIMPPLLE)—This model was used to provide a means of simulating succession and disturbance activities and to summarize fire behavior.

These models are tools that provide information useful for understanding vegetation change over time and the relative differences between alternatives. The Spectrum and SIMPPLLE models are best used to

provide information of comparative value; these models are not intended to be predictive or to produce precise values for vegetation conditions. Out of necessity, the models simplify very complex and dynamic relationships between ecosystem processes and disturbances (such as climate, fire, and succession) and vegetation over time and space. Though best available information, including corroboration with actual data, professional experience, and knowledge, is used to build these models, there is a high degree of variability and an element of uncertainty associated with the results because of the ecological complexity and the inability to accurately predict the timing and/or location of future events. The following sections provide more detailed descriptions of each of the above-mentioned models.

Forest Vegetation Simulator

Growth and yield tables for the Spectrum model were developed using the Forest Vegetation Simulator. The Forest Vegetation Simulator is a family of forest growth simulation models. The basic Forest Vegetation Simulator model structure has been calibrated to unique geographic areas to produce individual Forest Vegetation Simulator variants. Since its initial development in 1973, it has become a system of highly integrated analytical tools. These tools are based upon a body of scientific knowledge developed from decades of natural resources research. Data from the Forest Inventory and Analysis database was used in developing the growth and yield tables. The use of the Forest Vegetation Simulator and of the timber prescriptions are documented in the report *Construction of Vegetative Yield Profiles for Forest Plan Revision* (Vandendriesche, 2005). The resulting yield tables were used in modeling timber harvest levels in the Spectrum model.

Spectrum Model

Spectrum is a software modeling system designed to assist decision makers in exploring and evaluating multiple resource management choices and objectives. Models constructed with Spectrum apply management actions to landscapes through a time horizon and display resulting outcomes. Management actions are selected to achieve desired goals (objectives) while complying with all identified management objectives and limitations (constraints). Spectrum makes it possible to display management actions at multiple spatial and temporal scales. This model is very effective in modeling alternative resource management scenarios in support of strategic and tactical planning. Examples of this include scheduling vegetation treatments to achieve desired conditions; modeling resource effects and interactions within management scenarios; exploring “tradeoffs” between alternative management scenarios; and analyzing minimum habitat requirements to ensure species viability and diversity.

Spectrum was used to model potential vegetation treatments across the Forest over time under the different alternatives developed for the forest plan. The action alternatives were modeled with an objective based on the achievement of desired conditions, as described in the plan, for forest composition and size classes. For example, a downward trend in the small forest size class and an upward trend in the large size class is a desired condition forestwide, which the model may achieve with regeneration treatment (i.e., clearcut or seed tree cut) of some small-size-class forest to convert it to seedling/sapling-size-class forest, leaving some to advance into larger tree size classes. In addition, to meet desired conditions for increased amounts of ponderosa pine and western white pine, the regenerated stands could be converted (i.e., through planting) to desired species.

In addition to the objectives, the model applies constraints to potential actions based on other resource factors that would limit treatments, such as lynx habitat, grizzly bear security, known operational or logistical limitations (such as with prescribed burning), and management area direction (such as suitability for timber production or prohibitions on certain treatments). Limits associated with budget levels are also evaluated. In the end, Spectrum model formulation and outcomes provide a schedule of

activities for the Flathead National Forest (harvest and prescribed fire) that help provide answers to the following questions:

- What vegetative treatments are selected and how should they be scheduled to move towards the desired conditions for vegetation, with and without budget limitations?
- What is the projected timber sale quantity, with and without budget limitations?
- What amount of timber can be removed annually in perpetuity on a sustained-yield basis (i.e., the sustained yield limit)?

The Spectrum and SIMPPLLE models are used interactively to analyze vegetation conditions. Wildland fire disturbances are first modeled in SIMPPLLE. Resultant disturbance levels are then input into the Spectrum model as acres of projected wildland fire. The Spectrum model is then run to meet desired conditions or other objective functions (see discussion below on the Spectrum model). The outputs from Spectrum are input into the SIMPPLLE model to allow for integration with the ecological processes and disturbances as modeled within SIMPPLLE (fire, insect, disease, succession) and spatial analysis of the change in vegetation conditions over time (refer to the later section titled SIMPPLLE Modeling Results of Vegetation Change and to appendix 3, Modeled Wildlife Habitat Assessment). Figure 2-1 displays the interaction and relationship between the Spectrum and SIMPPLLE models.

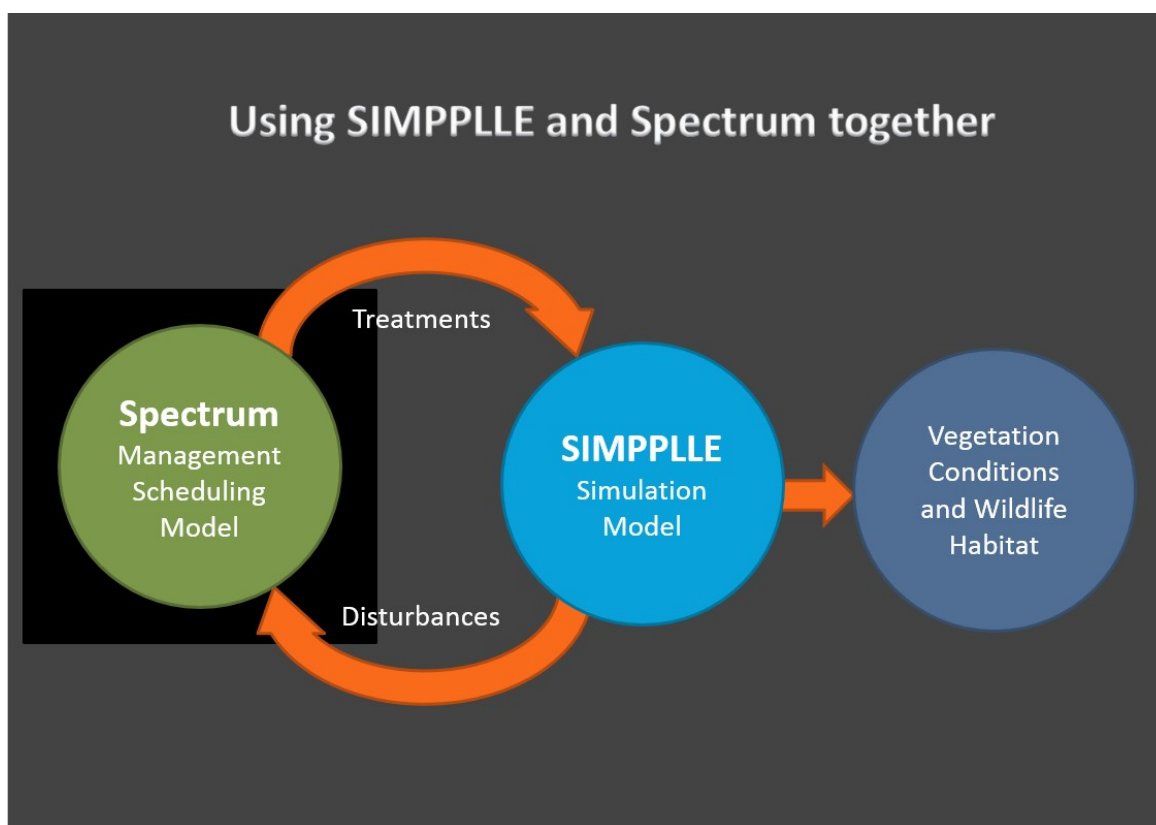


Figure 2-1. Use of Spectrum and SIMPPLLE in determining effects on vegetation conditions and habitat

SIMPPLLE Model

SIMulating Patterns and Processes at Landscape scaLEs (SIMPPLLE) is a model that simulates changes in vegetation on landscapes in response to both natural disturbances and management activities as they interact with climatic conditions. This model was used in the forest plan revision for two purposes: to

calculate the natural range of variation for vegetation conditions and to project the vegetation conditions of the alternatives across the Forest into the future for analysis in the environmental impact statement (EIS). The Region 1 VMap GIS layer is the primary data used for describing the existing vegetation conditions for the Flathead National Forest. Potential vegetation types, geographic areas, and ownership are also integrated into the existing data layer.

SIMPPLLE takes a landscape condition at the beginning of a simulation (including past disturbances and treatments) and uses logic to grow the landscape through time while simulating processes (growth, fire, insects, etc.) that might occur on that landscape during the simulation, accounting for the effects of those processes. It is a state and transition model, incorporating multiple pathways of change in vegetation in response to climate, disturbances, growth, and other processes. Simulation timesteps are 10 years, and simulations are made for multiple timesteps. The logic assumptions in the model come from a variety of sources, including expert opinion, empirical data, modeled data from other forestry computer applications such as Forest Vegetation Simulator, and initial model logic files that reflect a long history of trial and error and research that has been maintained and documented in files that are passed from Forest to Forest.

One of the main utilities of the SIMPPLLE model is its stochastic nature. The model is typically run for multiple iterations to allow the manager to see a variety of possible projections, look for patterns, and adjust management response accordingly. Managers cannot know with precision the specific types, locations, and extents of natural disturbances that will occur on the landscape. Therefore, the SIMPPLLE model will randomly assign fire, insect, and disease processes on the landscape in a manner consistent with what is known about the nature of these disturbances (e.g., insect-prone stands have a higher hazard and probability of getting an infestation, especially in a dry climate cycle).

The other main utility of the SIMPPLLE model is its spatially interactive nature. A process occurring on one site is dependent, to an extent, on the processes that are occurring on adjacent sites. Consider a fire event. SIMPPLLE simulates fire by assigning fire starts with a probability consistent with what historic records indicate for the area and climate. Each start is then given the opportunity to grow. The size the fire grows to is dependent on the surrounding vegetation as well as the historic probability that it will end with a weather event (or, if simulating fire suppression, whether or not there are enough resources, etc., to put the fire out). The type of fire that spreads (lethal, semi-lethal, or non-lethal) is dependent on the vegetation conditions of the site (including past disturbance or treatment), the climate assumption for the timestep, its elevational position relative to the burning fire (uphill, downhill, etc.), and whether it is downwind or not. Again, the fire process will stop according to the probability of a weather-ending event, successful fire suppression, or perhaps running up against a natural barrier such as the treeline or a lake. SIMPPLLE will then determine the effect of the fire by considering whether there are trees present capable of reseeding/resprouting the site (in the case of a lethal fire), whether the stand's fuel conditions have been reduced (for semi- or non-lethal fires), and whether there has been a change in size and/or species on the site.

The SIMPPLLE analysis for the Flathead National Forest uses the Region 1 VMap as the existing vegetation conditions layer. SIMPPLLE data was calibrated with Forest Inventory and Analysis data for vegetation species and size classes. Refer to Trechsel (2016b) for information on these vegetation databases.

The SIMPPLLE model for the Forest Service Northern Region's Westside zone was the initial source model used for the Flathead National Forest (see documentation at <http://www.fs.fed.us/rm/missoula/4151/SIMPPLLE/>). The Nez Perce-Clearwater National Forests revised the logic in this model in 2012, which was then used as the foundation for the Flathead National Forest model development and analysis. A number of key updates of the logic files and assumptions were conducted to more closely reflect the ecosystems and processes on the Flathead National Forest. These

include modification of certain successional pathways, regeneration logic, insect/disease probabilities, and fire logic (e.g., fire severity, fire size/spread, fire event probabilities, and weather-ending events). Updates to the model between the publishing of the draft EIS and the final EIS also occurred to more accurately reflect fire and bark beetle disturbances as well as to conduct some additional corroboration of size class between the R1 VMap data layer and the Forest Inventory and Analysis data set. Details on the development of the SIMPPLLE model and the model updates that were completed throughout the forest plan revision analysis process can be found in Henderson (2017) and Chew (2014). As discussed earlier, even though best available information was used to develop and update the model, there remains relatively high uncertainty in the results due to the ecological complexities and lack of ability to predict the future. Actual amounts of fire or bark beetle activity on the landscape in the future, for example, and the impact to vegetation could be quite different from that modeled. Up to 30 model simulations were run to better capture the variability and uncertainties associated with disturbance events and resulting vegetation change.

Vegetation Desired Conditions

The intent of the Forest Service is to promote ecosystem integrity in the plan area, design plan components to maintain or restore natural range of variation for key ecosystem components, and establish desired future conditions that enhance the resiliency of the landscape (2012 planning rule, Forest Service Handbook 1909.12 chap. 20). The natural range of variation is generally defined in the directives as “the variation of ecological characteristics and processes over scales of time and space that are appropriate for a given management application” (Forest Service Handbook 1909.12 chap. Zero Code). An understanding of the natural range of variation for vegetation components provides insight into the dynamic nature of the Forest ecosystems, the conditions that have sustained the current complement of wildlife and plant species on the Flathead National Forest, and the structural and functional properties of a resilient ecosystem. However, the directives also recognize there may be other factors (social, economic, or ecological) that lead the responsible official to determine that the natural range of variation may not be an appropriate desired condition for certain vegetation characteristics (Forest Service Handbook 1909.21 chap. 23.11a).

Desired conditions were developed for the key vegetation components identified on the Flathead National Forest. These components are as follows:

- Vegetation composition, as measured by vegetation dominance type (conifer and non-forest types) and tree species presence
- Forest size class (diameter) and very large tree component
- Old-growth forest
- Forest density (tree canopy cover percent)
- Snags and downed wood
- Landscape vegetation pattern—forest size class patch characteristics

Development of Desired Conditions

Factors influencing development of desired conditions for the key vegetation components are listed below. All factors are governed by the prevailing concept to maintain ecosystem and forest resilience, as informed by evaluation of natural range of variation. Greater details on these factors and resulting desired conditions can be found in Trechsel (2016a). The factors have been broadly grouped into the following three themes:

1. Maintain conditions that would better contribute to long-term ecosystem resilience and adaptation to uncertainties of future climate and disturbances

Manage for species that have favorable traits that would improve their ability to persist in light of rapidly changing future environmental conditions. This “trait-based ecology” approach (Laughlin, Strahan, Huffman, & Sanchez Meador, 2016) strives to maintain or expand the presence of tree species or structures that would increase the probability of maintaining desired composition and structural conditions in the future forest. On the Flathead National Forest, this equates mainly to managing for species and structures with resistance to drought, fire, insects, or disease and includes

- increased presence (distribution) and dominance of ponderosa pine, western larch, western white pine, and whitebark pine;
- increased tree species diversity (species presence) across the landscape;
- increased presence of large and very large tree sizes, with a focus on western larch, ponderosa pine, western white pine, and whitebark pine; and
- reduced high-density forest conditions in portions of the landscape.

2. Sustain important wildlife habitat conditions

Promote vegetation types and stand structures that provide habitat conditions important to key wildlife species and/or may currently be less common across the landscape. These types include

- late-successional/old-growth forest conditions, particularly ponderosa pine on the warm-dry potential vegetation type, cedar on portions of the warm-moist potential vegetation type, and stands with very large western larch overstory on the cool-moist potential vegetation type;
- whitebark-pine-dominated plant communities on the cold potential vegetation type;
- multistory subalpine fir-/spruce-dominated hare habitat to provide for Canada lynx;
- desired pattern, structure, density, and composition of forests on elk/deer winter range; and
- non-coniferous vegetation types, specifically hardwood forest types and dry grasslands.

3. Consideration of social and economic factors

Take into account the influence of social and economic factors on desired conditions, mainly within the wildland-urban interface and areas of the Forest with greater amounts of human recreational use and access and intermingled ownerships, including

- forest densities within the warm-moist potential vegetation type, the majority of which occurs in the wildland-urban interface, to reduce expected fire behavior and improve human safety; and
- forest patterns, specifically the size of openings (seedling/sapling forest patches) to address increased visual (scenic) sensitivity and wildlife security.

Evaluation of Natural Range of Variation

The Flathead National Forest used a variety of methods to determine the natural range of variation for the vegetation components, depending upon available data and methodology. These are described below.

Vegetation composition, forest size class, and forest density

For the Flathead National Forest assessment (USDA, 2014), a quantified historical range of variability analysis conducted on the Flathead in 1999 was the best available data and was used to inform the

discussion of historical reference conditions for vegetation composition and structure in the assessment (refer to USDA, 2013). For the revised plan, the SIMPPLLE model was used to develop a quantified estimate of the natural range of variation for these vegetation components. Results from the 1999 historical range of variability analysis helped corroborate the SIMPPLLE model results. Refer to Henderson (2017) and Trechsel (2014, 2017a, 2017b) for detailed information on the analysis that estimated natural range of variation. A brief summary is provided below.

As suggested in the directives, when considering the period of time over which to evaluate the natural range of variation, “the pre-European influenced reference period considered should be sufficiently long, often several centuries . . .” and should “include short-term variation and cycles in climate” (Forest Service Handbook 1909.12 chap. Zero Code). For the Flathead National Forest analysis, vegetation conditions back to the year 960 CE (Common Era) were modeled. This reference period allowed us to simulate the conditions associated with much of the time period known as the Medieval Climate Anomaly (about 950 to 1250), as well as the other end of the climate spectrum known as the Little Ice Age (early 1300s to about 1870s). The inclusion of the Medieval Climate Anomaly in the simulation is potentially valuable in that it might indicate conditions and processes that could occur in the modern climate regime under a warmer, drier scenario (Calder, Parker, Stopka, Jimenez-Moreno, & Shuman, 2015). The model was run under a scenario that assumed only natural ecological processes and disturbances and their interaction with climate. Thirty simulations were run to better capture the variability and uncertainties associated with disturbance events and resulting vegetation change.

In consultation with the Rocky Mountain Research Station in Missoula, Montana, it was determined that the appropriate indicator of past climate is the Palmer Drought Severity Index (Alley, 1984). Data for this index is typically reconstructed for localized points, and the data point nearest the Flathead National Forest was used to evaluate the climate for the area. The data was categorized into three climate scenarios: wetter, drier, and normal. Refer to Henderson (2017) for greater detail on how climate was used in the modeling process.

Graphs displaying results from the SIMPPLLE natural range of variation analysis are found in Trechsel (2017a). The natural range of variation is displayed as a range (minimum and maximum) in proportion of area forestwide and for some components by potential vegetation types, vegetation dominance types, conifer tree species presence, forest size classes, and forest canopy cover classes. The results of this natural range of variation analysis informed the development of desired conditions for the revised forest plan (Trechsel, 2016a).

The SIMPPLLE model was also used to project vegetation change into the future, as affected by anticipated treatments, natural disturbances, and climate change. Because the same methodology was used, these results could then be compared to the natural range of variation or to the desired conditions, and differences between alternatives analyzed in the EIS. Refer to Trechsel (2017b) and USDA (2017) for graphs displaying disturbances and estimated changes in vegetation conditions over the 5-decade future modeling period. Refer also to discussions later in this appendix under the section on SIMPPLLE modeling results.

Old-growth forest

There is no means to determine a statistically sound, quantifiable estimate of the natural range of variation for old-growth forest as defined for the Flathead National Forest (Green et al., 2011) because the characteristics associated with old-growth forest can be determined only through site-specific inventory. Forest plan amendment 21 (USDA, 1998), which incorporated new old-growth management direction into the current Flathead forest plan (USDA, 1986), evaluated historical old-growth forest conditions using a variety of sources, including historical surveys, dendrochronology studies, and computer

modeling (i.e., the 1999 historical range of variability analysis described earlier). This was the main source of information for documenting reference conditions for old-growth forest in the Flathead assessment (USDA, 2014). For development of the revised plan, this information was supplemented with results of the SIMPPLLE natural range of variation analysis for the large and very large forest size classes, which have some correlation with old-growth forest conditions. An approximation of natural range of variation for old-growth forest also was derived by evaluating current conditions for the “large tree component” across the Flathead. Refer to the final EIS section on old growth (section 3.3.7) for details relating to assessment of old-growth forest.

Snags and downed wood

The SIMPPLLE model results do not provide a quantified natural range of variation for these components. Information sources used to assess snag and downed wood natural range of variation include (a) Forest Inventory and Analysis reports displaying existing amounts of these components across the Forest, particularly within wilderness and roadless areas; and (b) evaluation of the natural range of variation for natural disturbance processes (as modeled with SIMPPLLE). Assuming that conditions within wilderness areas would most closely represent ecosystems functioning under natural disturbance regimes, a review of the existing snag and downed wood component within and outside wilderness and roadless areas provided clues as to what might be an average natural condition for the amount or type of snags and downed wood on average across the landscape. A review of the natural range of variation results for fire and insect/disease activity across the Forest as to the role they and natural succession play in creating snags and downed wood also aided in understanding the natural range of variation for these components. Refer to section 3.3.8 in the final EIS and to Trechsel (2017c) for details on the analysis of existing and natural range of variation for snags and downed wood.

Landscape pattern

The 1999 historical range of variability analysis described earlier, which provided estimates of historical range of variability for vegetation composition and structure, also provided quantified estimates related to the pattern of these forest patches across the landscape (refer to USDA, 2013). As the best available information, results of this analysis were used to inform the discussion of historical reference conditions for vegetation pattern in the 2014 assessment of the Flathead National Forest. However, it is very difficult to use the results of that analysis in the development and analysis of the revised forest plan and alternatives. The site and vegetation classifications differ substantially from those used in the revised forest plan, and cross-referencing them is problematic and subject to broad interpretation. The data used is relatively dated (mid-1990s), considering the large amount of area on the Forest altered by wildfire over the past 20 years. It is infeasible to update the 1999 historical range of variability analysis or translate it into the Forest’s current classification and analysis structure; nor can we project future changes in pattern (either using the same methodology or a different process) that can be correctly compared to current conditions. Use of consistent methodology for evaluating past, present, and future landscape patterns would be important to appropriately interpret and evaluate spatial statistics associated with patch dynamics. Therefore, though the 1999 historical range of variability analysis was useful in improving our understanding of the ecosystem conditions on the Flathead National Forest and assessing its ecological integrity, direct use of the quantitative results from that analysis to develop desired conditions and conduct effects analysis was not possible.

For development of the revised forest plan, an analysis of natural range of variation for patch size of early successional (seedling/sapling) forest was conducted using the SIMPPLLE model natural range of variation results for stand-replacing fire events (the primary disturbance that creates these patches) over the past 1,000 years (refer to Trechsel, 2017d). This natural range of variation analysis was used to inform the development of forest plan components related to forest pattern across the Flathead National Forest

landscape. The analysis was limited to analysis of seedling/sapling forest patches for several reasons. The 1999 historical range of variability analysis noted the most departure from and greatest concern related to ecological integrity for the early successional forest patch sizes and densities, when compared to historical conditions. The dominance of grass, forbs, shrubs, and short trees within these early successional forests creates a patch—an opening—that forms strong contrast (e.g., forest “edge”) and is distinctly different from the adjacent small, medium, large, or very large forest size class patches. Not only does this allow for more accurate detection and measurement of the patch and resulting landscape patterns (past, present, and future), but the seedling/sapling forest patch type is particularly meaningful for evaluation of wildlife habitat conditions, forest cover, and connectivity. The larger trees and denser forest cover present in the adjacent small to very large forest size class patches provide the connectivity of habitat important to many wildlife species. Early successional stages also represent the crucial initiation point of forest development and thus greatly influence potential future conditions and patterns. Refer to section 3.3.9 in the final EIS on landscape patterns for additional discussion of the analysis conducted.

Identification of Lands Suitable for Timber Production

The National Forest Management Act directs forests to identify lands that are not suited for timber production. The act states at sec. 6 (k), “the Secretary shall identify lands within the management area which are not suited for timber production, considering physical, economic, and other pertinent factors to the extent feasible, as determined by the Secretary, and shall assure that, except for salvage sales or sales necessitated to protect other multiple-use values, no timber harvesting shall occur on such lands for a period of 10 years.”

The assessment of suitable timberlands was accomplished using GIS. Use of GIS resulted in consistent identification of each step in determining suitability.

Criteria for determining lands not suitable for timber production are outlined in Forest Service Handbook 1909.12 sec. 61. A two-step process is used:

1. Identify lands that are not suited for timber production based on legal and technical factors, as follows:
 - Statute, executive order, or regulation prohibits timber harvest on the land, or the Secretary of Agriculture or the Chief of the Forest Service has withdrawn the land from timber harvest as described in section 61.11.
 - The technology is not currently available for conducting timber harvest without causing irreversible damage to soil, slope, or other watershed conditions as described in section 61.12.
 - There is no reasonable assurance that such lands can be adequately restocked within 5 years after final regeneration harvest as described in section 61.13.
 - The land is not forest land as described in section 61.14.

After subtracting the lands that are not suited from the total of NFS lands, the remaining lands are lands that may be suited for timber production and are considered in step 2.

2. From the lands that may be suited for timber production, identify the lands that are suited for timber production based on their compatibility with the land area’s desired conditions and objectives, as described in section 61.2.

This step varies by alternative, based on management area allocation and desired conditions of management areas. On the Flathead National Forest, riparian management zones (for action alternatives)

or riparian habitat conservation areas (for alternative A) are not suitable for timber production. After lands suited for timber production have been identified, the remaining lands that may be suited for timber production are identified as not suited for timber production because timber production is not compatible with the land area's desired condition or objectives.

Lands suitable for timber production were updated between the draft EIS and the final EIS for updated riparian management zones for the action alternatives and updated riparian habitat conservation areas for alternative A. The action alternatives also had minor changes to timber suitability due to the allocation of an additional recommended wild and scenic river and other small changes to management area allocations in alternatives C and D. The Spectrum model was not re-run for timber production as the changes to suitability were minor (less than 4 percent for all alternatives). See Frament (2017) for more information on this change.

Table 2-1 displays the acres for each step in determining lands suitable for timber production by alternative.

Table 2-1. Timber suitability by alternative

Timber Suitability	Alternative A (acres)	Alternative B Modified (acres)	Alternative C (acres)	Alternative D (acres)
NFS lands	2,392,816	2,392,816	2,392,816	2,392,816
Withdrawn lands	-1,371,709	-1,371,709	-1,371,709	-1,371,709
Irreversible damage potential or restocking not ensured	-166,513	-166,513	-166,513	-166,513
Nonforested land	-117,204	-117,204	-117,204	-117,204
Lands that may be suitable for timber production	737,390	737,390	737,390	737,390
Areas where timber production is not compatible with the land area's desired conditions and objectives	-202,761	-272,207	-429,144	-254,741
Suitable for timber production	534,629	465,183	308,246	482,649

Alternative A is the current forest plan as amended and implemented. Timber suitability has been updated to reflect forest plan amendments, updated data, and current conditions. Alternatives B modified, C, and D are alternatives to the current plan and reflect a range of possible management options for revision of the current forest plan.

Figures 1-09 through 1-12 display lands suitable for timber production for each alternative. Trechsel (2015) and Ake (2015) in the planning record provide detailed information on the analysis process and GIS layers used to identify lands suitable for timber production.

Spectrum Modeling for Vegetation Treatments and Timber Outputs

Components of the Spectrum Model

The Spectrum model is comprised of the following components:

- Planning horizon—A specified time frame broken down into periods of an equal number of years. The horizon may be as short or long as desired. Long planning horizons are used to investigate the sustainability of long-term management actions such as long rotations.
- Land stratification and analysis units—The planning area is subdivided into areas that facilitate analyzing land allocation and management scheduling analysis. The subdivision is largely a function of two determinants: (1) how managers want the Forest subdivided to answer planning questions and (2) how specialists need the Forest subdivided to estimate resource response to management scenarios.
- Management actions and output—A Spectrum model consists of a set of management actions applied to specific land units. Management actions consist of activities, outputs, treatments, and land conditions.
- Economic information—Basic activity cost and output revenues.
- Transition pathways—The Forest developed pathways to model how vegetation type and size varies over time based on different management actions. These pathways are used to measure movement towards desired conditions.
- Management constraints—These are limits defined to model resource thresholds, relations between and among activities and outputs, policy requirements, or monetary limitations.
- Objective function—Optimization models, such as Spectrum, minimize or maximize an objective function subject to a set of constraints. An objective function is defined in terms of its type (maximize or minimize), discount rate (if applicable), duration, and contributing activities and outputs.

Following is a description of the components of the Flathead National Forest Spectrum model.

Land stratification and analysis units

Land stratification is the process of identifying a set of attributes, or strata, to use in defining the land base. This is done to organize the forest land base into logical subunits that respond similarly to management actions. In Spectrum, each stratum is a layer, and a unique combination of layers results in an “analysis area.” Up to six layers of information can be used in Spectrum to describe analysis areas, and although analysis areas are usually homogeneous, they are not always contiguous. The Flathead used five layers of information in developing analysis areas. The attributes used in developing analysis areas are based on the issues to be addressed by the model and on differences in resource response.

The six Spectrum land stratification layers identified for the Flathead forest plan are defined as follows:

- Layer 1 — Inventoried roadless area and not inventoried roadless area
- Layer 2 — Management area group and timber suitability
- Layer 3 — Not used
- Layer 4 — Wildlife condition
- Layer 5 — Cover type
- Layer 6 — Size class

Table 2-2 defines the classification for each layer, listing the layer’s codes and descriptions. Analysis areas are developed by combining the six layers in GIS and calculating the amount of acreage for each combination.

Table 2-2. Spectrum land stratification

Layer	Description
Layer 1—Roadless Status	Layer 1 Description
IRA	Inventoried roadless area
NOIRA	Not inventoried roadless area
Layer 2—Management Area (MA) Group and Timber Suitability	Layer 2 Description
MAG1	Not suitable for timber production, not suitable for timber harvest MA 1a, 1b, 2a (WSR wild), 2b (WSR wild), 4a Includes all land classified as not suitable for timber harvest because of possible irreversible damage or non-forested condition
MAG2	Not suitable for timber production, suitable for timber harvest at very low intensity MA 2a and 2b (WSR recreation and scenic), 3a, 3b, 4b (Coram Experimental Forest), 5a, 5b, 5c, 5d, part of 7 Riparian Habitat Conservation areas or Riparian Management Zones (within MAs 2a, 2b, 3a, 3b, 5a-d, 6a-c, and 7)
MAG3	Not suitable for timber production, suitable for timber harvest at low intensity MA 6a
MAG4	Suitable for timber production at moderate intensity MA 6b, parts of 7
MAG5	Suitable for timber production at higher intensity MA 6c, 4b (Miller Creek Demonstration Forest), parts of 7
Layer 4—Wildlife Condition	Layer 4 Description
GBCLH	Grizzly bear core and lynx habitat
GBCNLH	Grizzly bear core and no lynx habitat
GBNCL	Grizzly bear non-core and lynx habitat (note: there is no land that is grizzly bear non-core habitat and not lynx habitat)
BGWR	Whitetail deer winter range
Other	Other
Layer 5—Cover Type	Layer 5 Description
IMX-WM	Shade intolerant mix—Warm-moist (DF, WL, PP)
IMX-WD	Shade intolerant mix—Warm-dry (DF, PP, WL)
IMX-CM	Shade intolerant mix—Cool-moist (WL, DF)
LP	Lodgepole pine
TMX-WM	Shade tolerant mix—Warm-moist (GF/C)
TMX-CM	Shade tolerant mix—Cool-moist (AF/ES)
Other	Other—Nonforest
Layer 6—Size Class	Layer 6 Description
Seedling/sapling	Seedling/sapling (0 to 5 in.)
Small	Small (5-10 in.)
Medium	Medium (10-15 in.)
Large	Large (15+ in.)
Other	Other—Nonforest

Note. AF/ES =subalpine fir/Engelmann spruce, DF = Douglas-fir, GF/C = grand fir/western red cedar, MA = management area, PP = ponderosa pine, WL = western larch, WSR = wild and scenic river.

Management actions and outputs

The treatments in the model were developed to reflect management areas, standards, and guidelines in the Flathead forest plan. Silvicultural prescriptions (treatments), timing choices, and constraints defined in the model are for modeling purposes only and do not create standards or guidelines for plan implementation.

Silvicultural prescriptions were defined by cover type and other resource conditions. Table 2-3 describes the silvicultural prescriptions by cover type. These defined the analysis area management prescriptions. Silvicultural prescriptions were developed to manage vegetation towards desired condition. See the report *Construction of Vegetative Yield Profiles for Forest Plan Revision* (Vandendriesche, 2005) for further information on the silvicultural prescriptions.

Table 2-3. Silvicultural prescriptions by landbase/cover type

Spectrum Silvicultural Prescription	Application
Stand-Replacing Fire (unplanned ignitions)	Everywhere based on cover type and size class from SIMPPLLE modeling (see description below of stand-replacing fire)
Planned Ignitions (under-burn and stand-replacing)	Everywhere except in designated wilderness and TMX-WM. IMX-WM and IMX-WD are under-burns at 30-year intervals. LP, IMX-CM, and TMX-CM are single burns that are stand-replacing. ¹
Group Selection (uneven-aged management)	MAG2, 3, 4, 5; not in lodgepole
Clearcut/Seed Tree (CC/ST) with reserves (with or without commercial thinning) ²	MAG3, 4, 5
Shelterwood (SW)	MAG3, 4, 5
Commercial Thinning (CT)	Imbedded in CC/ST/SW based on stand age
Precommercial Thinning (PCT)	Imbedded in CC/ST/SW based on stand age. No PCT in lynx habitat
No Management	Everywhere

1. There is no prescribed burning in cover type Shade intolerant mix-Warm-moist because prescribed burn occurs only with timber harvest in this type.

2. The large size class does not have commercial thinning. All other size classes for the existing stand include "with or without commercial thinning."

Several timing choices were also applied to the silvicultural prescriptions. Timing choices are defined by specifying (within the model) the range of ages during which an existing stand and a regenerated stand may be treated. The earliest point at which a stand could be regeneration harvested was based on culmination of mean annual increment. The age at which the culmination of mean annual increment is attained was determined by the Forest Vegetation Simulator. Existing stands containing medium or large size classes have met the culmination of mean annual increment and are ready to be harvested at the beginning of the planning horizon. Based on varying constraints and the specified management goals or objectives, the Spectrum model determines the management prescription to apply to an analysis area as well as the timing of the implementation.

Yield tables included the following outputs:

- Merchantable mcf (thousand cubic feet)
- Merchantable mbf (thousand board feet)
- Diameter of removals and residual volume
- Fire risk

- Snags—Delineated by diameter classes of 10 to 20 inches and 20+ inches
- Insect risk (composite rating of insect risk)

Costs for management activities

Costs were developed for sale preparation and sale administration (combined), reforestation, timber stand improvement, prescribed burning, and road construction and reconstruction. Table 2-4 describes the activity, units, cost, and production coefficient (relationship for incurring the cost based on a particular activity).

Table 2-4. Costs for the Spectrum model

Activity	Costs	Production Coefficient	Timing
sale preparation and administration, per National Environmental Policy Act,	\$640/mcf	1/mcf harvested	With harvest
Reforestation (includes site preparation for natural regeneration and planting)	\$600/acre	0.1/acre CC/ST, SW 0.02/acre group selection 0 all others	With harvest
Timber stand improvement (pre-commercial thinning)	\$310/acre	0.35/acre clearcut/seed tree 0.2/acre group selection 0 all others	2 decades after harvest
Road reconstruction	0 Purchaser cost; no appropriated funds (just tracking number of miles)	0.01 miles/acre	With harvest; not inventoried roadless area
Road pre-construction/reconstruction administration	\$8,597/mile	0.01 miles/acre	With harvest
Prescribed burn	\$125/acre	1/acre	With prescribed burn

Note. mcf = thousand cubic feet.

All costs except prescribed burning are part of the budget constraint (see section on management constraints). To reflect higher unit costs within inventoried roadless areas, all activity costs within an inventoried roadless area or helicopter logging area (layer 1 code of “IRA”), except road construction and reconstruction, were increased by 20 percent. This increase was to reflect the increased access and analysis costs for these areas.

Timber values

Stumpage values for timber were developed by the regional timber program budget manager for the Northern Region, USDA Forest Service, with a residual value calculation. Residual value means that stumpage value is calculated as the difference between the delivered log price at a mill and the estimated harvest and delivery costs incurred by a buyer who purchases the timber. Delivered log values were based on the average delivered log price by species for 2004 to 2014 (through quarter 2). Logging system costs, estimated transportation costs, and profit, and risk to the purchaser were then subtracted to determine average stumpage price by species. Stumpage value by species was then cross-referenced with Spectrum species groups. Values for different logging systems were averaged for the amount that has occurred on the Forest over the past several years. Table 2-5 displays the average stumpage value for the model.

Table 2-5. Stumpage value by species

Species groups for the yield tables (VMap codes)	Spectrum Species Strata	Sawtimber Value (\$/mbf)
DFW	IMX-WM	\$99.37
IMXSW	IMX-CM	\$94.76
IMXSD	IMX-WD	\$98.86
LPP	LP	\$104.35
TGCH	TMX-WM	\$65.90
TASH	TMX-CM	\$73.94

Note. DFW = Douglas-fir, wet, IMXSW = Intolerant mix, wet, IMXSD = Intolerant mix, dry, LPP = lodgepole pine, TGCH = Tolerant mix, grand fir/cedar/western hemlock, TASH = Tolerant mix, subalpine fir/spruce/mountain hemlock. IMX-CM = Shade intolerant mix—Cool-moist, IMX-WD = Shade intolerant mix—Warm-dry, IMX-WM = Shade intolerant mix—Warm-moist, LP = lodgepole pine, TMX-CM = Shade tolerant mix—Cool-moist, TMX-WM = Shade tolerant mix—Warm-moist

Transition pathways

Pathways were developed to indicate how species and size class would be expected to change over time, given the silvicultural prescription. Pathways for species are displayed in table 2-6 to table 2-9 and pathways for size classes in table 2-10 to table 2-13. These pathways were used to model movement towards vegetation desired condition. The treatment designation of “Natural Growth” is the silvicultural prescription equivalent of no management, “Even-Aged Harvest” is the silvicultural prescription equivalent of regeneration, and “Uneven-Aged Management” is the individual tree and group selection silvicultural prescriptions. Pathways were developed by the silviculturist on the interdisciplinary team.

The following abbreviations are referenced in the pathways for species tables: CT = Commercial thin, DF = Douglas-fir, IMX-CM = Shade intolerant mix—Cool-moist, IMX-WD = Shade intolerant mix—Warm-dry, IMX-WM = Shade intolerant mix—Warm-moist, LP = lodgepole pine, PCT = precommercial thin, SS = seedling/sapling, TMX-CM = Shade tolerant mix—Cool-moist, TMX-WM = Shade tolerant mix—Warm-moist

Table 2-6. Spectrum species transition changes under natural growth and stand-replacing fire treatment

Spectrum Cover Type	Age	Percent (%) Species
IMX-WM	0-180	40% DF, 45% WL, 15% PP
IMX-WM	180+	20% DF, 25% WL, 55% TMX-WM
IMX-WD	0-180	70% DF, 10% WL, 20% PP
IMX-WD	180+	80% DF, 10% WL, 10% PP
IMX-CM	0-160	50% WL, 50% DF
IMX-CM	160+	20%WL, 10%DF, 70% TMX-CM
LP	0-90	100% LP
LP	90-120	50% LP, 50% TMX-CM
LP	120+	100% TMX-CM
TMX-CM	All ages	100% TMX-CM
TMX-WM	All ages	100% TMX-WM

Table 2-7. Spectrum species transition changes under even-aged harvest treatment

Spectrum Cover Type	Age	Percent (%) Species
IMX-WM	At PCT/CT	50% WL, 35% DF, 15% PP
IMX-WM	At regeneration	50% WL, 20% DF, 20% WP, 10% PP
IMX-WD	At PCT	50% DF, 40% PP, 10% WL

Spectrum Cover Type	Age	Percent (%) Species
IMX-WD	At CT	25% DF, 60% PP, 15% WL
IMX-WD	At regeneration	20% DF, 65% PP, 15% WL
IMX-CM	After first treatment	40% WL, 30% DF, 20% TMX-CM, 10% WP
LP	After first treatment	70% LPP, 10% WL, 10%, DF, 10% TMX-CM
TMX-CM	At PCT or CT	20% WL, 20% DF, 60% TMX-CM
TMX-CM	At regeneration	40% WL, 30% DF, 20% TASH, 10% WP
TMX-WM	At PCT or CT	20% WL, 20% DF, 60% TMX-WM
TMX-WM	At regen	50% WL, 20% DF, 20% WP, 10% PP

Table 2-8. Spectrum species transition changes under uneven-aged management treatment

Spectrum Cover Type	Age	Percent (%) Species
IMX-WM	1 st and 2 nd entry	40% WL, 45% DF, 5% PP, 10% WP
IMX-WM	3 rd entry	40% WL, 30% DF, 5% PP, 15% WP, 10% TMX-WM
IMX-WM	4 th entry+	45% WL, 25% DF, 5% PP, 15% WP, 10% TMX-WM
IMX-WD	1 st entry	80% DF, 17% PP, 3% WL
IMX-WD	2 nd entry	70% DF, 25% PP, 5% WL
IMX-WD	3 rd entry	55% DF, 35% PP, 10% WL
IMX-WD	4 th entry+	40% DF, 45% PP, 15% WL
IMX-CM	1 st and 2 nd entry	20% WL, 55% DF, 20% TMX-CM, 5%WP
IMX-CM	3 rd and 4 th entry	25% WL, 30% DF, 35% TMX-CM, 10% WP
IMX-CM	5 th entry+	25% WL, 25% DF, 40% TMX-CM, 10% WP
LP	Not applicable	Not applicable
TMX-WM	1 st entry	10% WL, 5% DF, 5% WP, 80% TMX-WM
TMX-WM	2 nd entry	15% WL, 10% DF, 10% WP, 65% TMX-WM
TMX-WM	3 rd entry	20% WL, 20% DF, 5% PP, 10% WP, 45% TMX-WM
TMX-WM	4 th entry	25% WL, 25% DF, 10% PP, 15% WP, 25% TMX-WM
TMX-WM	5 th entry	30% WL, 30% DF, 10% PP, 20% WP, 10% TMX-WM
TMX-CM	1 st entry	15% WL, 15% DF, 65% TMX-CM, 5% WP
TMX-CM	2 nd entry	15% WL, 20% DF, 60% TMX-CM, 5% WP
TMX-CM	3 rd entry	15% WL, 20% DF, 55% TMX-CM, 10% WP
TMX-CM	4 th entry+	20% WL, 20% DF, 50% TMX-CM, 10% WP

Table 2-9. Spectrum species transition changes under prescribed burn treatment

Spectrum Cover Type	Age	Percent (%) Species
IMX-WD	0-30	75% DF, 20% PP, 5% WL
IMX-WD	31-60	45% DF, 45% PP, 10% WL
IMX-WD	61+	20% DF, 65% PP, 15% WL
IMX-WM	0-30	20% WL, 60% DF, 15% PP, 5% WP
IMX-WM	31-60	40% WL, 40% DF, 15% PP, 5% WP
IMX-WM	61+	50% WL, 25% DF, 15% PP, 10% WP
IMX-CM	All ages (1 burn)	40% WL, 30% DF, 20% LP, 10% TMX-CM
LP	All ages (1 burn)	90% LP, 5% WL, 5% DF
TMX-CM	All ages (1 burn)	30% LP, 20% TMX-CM, 30% WL, 20% DF

Spectrum Cover Type	Age	Percent (%) Species
TMX-WM	Not applicable	Not applicable

Table 2-10. Spectrum size class transition changes under natural growth treatment

Spectrum Cover Type	Age	Size
IMX-WM	0-30	Seedling/sapling
IMX-WM	31-60	Small
IMX-WM	61-110	Medium
IMX-WM	111+	Large
IMX-CM	0-30	Seedling/sapling
IMX-CM	31-90	Small
IMX-CM	91-120	Medium
IMX-CM	121+	Large
IMX-WD	0-30	Seedling/sapling
IMX-WD	31-90	Small
IMX-WD	91-130	Medium
IMX-WD	131+	Large
LP	0-30	Seedling/sapling
LP	31-90	Small
LP	91-140	Medium
LP	141+	Large
TMX-CM	0-30	Seedling/sapling
TMX-CM	31-90	Small
TMX-CM	91-120	Medium
TMX-CM	121+	Large
TMX-WM	0-30	Seedling/sapling
TMX-WM	31-60	Small
TMX-WM	61-110	Medium
TMX-WM	111+	Large

Table 2-11. Spectrum size class transition changes under even-aged management treatment

Spectrum Cover Type	Age	Percent (%) Species
IMX-WD	0-30	Seedling/sapling
IMX-WD	31-70 (PCT)	Small
IMX-WD	71-100 (CT)	Medium
IMX-WD	101+ until regeneration	Large
IMX-WM and TMX-WM	0-30	Seedling/sapling
IMX-WM and TMX-WM	31-60 (PCT)	Small
IMX-WM and TMX-WM	61-90 (CT)	Medium
IMX-WM and TMX-WM	91+ until regeneration	Large
LP	0-30	Seedling/sapling
LP	31-80 (PCT,CT)	Small
LP	81-130 (CT or regeneration)	Medium
LP	131+ until regeneration	Large

Spectrum Cover Type	Age	Percent (%) Species
IMX-CM and TMX-CM	0-30	Seedling/sapling
IMX-CM and TMX-CM	31-90 (PCT)	Small
IMX-CM and TMX-CM	91-120 (CT or regeneration)	Medium
IMX-CM and TMX-CM	121+ until regeneration	Large

Table 2-12. Spectrum size class transition changes under uneven-aged management group selection treatment

Spectrum Cover Type	Age	Percent (%) Species
All strata except LPP size Large	Entry 1	5% SS, 10% Small, 5% Medium, 80% Large
All strata except LPP size Large	Entry 2	10% SS, 20% Small, 10% Medium, 60% Large
All strata except LPP size Large	Entry 3	10% SS, 30% Small, 20% Medium, 40% Large
All strata except LPP size Large	Entry 4	10% SS, 20% Small, 20% Medium, 50% Large
All strata except LPP size Large	Entry 5	10% SS, 30% Small, 20% Medium, 40% Large
All strata except LPP size Medium	Entry 1	10% SS, 10% Small, 80% Medium
All strata except LPP size Medium	Entry 2	5% SS, 10% Small, 5% Medium, 80% Large
All strata except LPP size Medium	Entry 3	10% SS, 20% Small, 10% Medium, 60% Large
All strata except LPP size Medium	Entry 4	10% SS, 30% Small, 20% Medium, 40% Large
All strata except LPP size Medium	Entry 5	10% SS, 20% Small, 20% Medium, 50% Large
All strata except LPP size Medium	Entry 6	10% SS, 30% Small, 20% Medium, 40% Large
All strata except LPP sizes small and seedling/sapling	Entry 1	20% SS, 80% Small
All strata except LPP sizes small and seedling/sapling	Entry 2	10% SS, 10% Small, 80% Medium
All strata except LPP sizes small and seedling/sapling	Entry 3	5% SS, 10% Small, 5% Medium, 80% Large
All strata except LPP sizes small and seedling/sapling	Entry 4	10% SS, 20% Small, 10% Medium, 60% Large
All strata except LPP sizes small and seedling/sapling	Entry 5	10% SS, 30% Small, 20% Medium, 40% Large
All strata except LPP sizes small and seedling/sapling	Entry 6	10% SS, 20% Small, 20% Medium, 50% Large
All strata except LPP sizes small and seedling/sapling	Entry 7	10% SS, 30% Small, 20% Medium, 40% Large

Table 2-13. Spectrum size class transition changes under prescribed burn treatment

Spectrum Cover Type	Age	Percent (%) Species
LP	One Entry	100% SS
TMX-CM and IMX-CM	One Entry	100% SS
All species except LP, TMX-CM, and IMX-CM (sizes Small and Seedling/sapling)	Entry 1, 2	20% SS, 60% Small, 20% Medium
All species except LP, TMX-CM, and IMX-CM (sizes Small and Seedling/sapling)	Entry 3, 4	10% SS, 20% Small, 50% Medium, 20% Large
All species except LP, TMX-CM, and IMX-CM (sizes Small and Seedling/sapling)	Entry 5+	40% Med, 60% Large
All Species except LP, TMX-CM, and IMX-CM (size Medium)	Entry 1, 2	20% SS, 80% Medium
All Species except LP, TMX-CM, and IMX-CM (size Medium)	Entry 3, 4	10% SS, 10% Small, 40% Medium, 40% Large
All Species except LP, TMX-CM, and IMX-CM (size Medium)	Entry 5+	10% SS, 10% Small, 20% Medium, 60% Large
All species except LP, TMX-CM, and IMX-CM (size Large)	Entry 1, 2	20% SS, 80% Large

Spectrum Cover Type	Age	Percent (%) Species
All species except LP, TMX-CM, and IMX-CM (size Large)	Entry 3, 4	10% SS, 10% Small, 20% Medium, 60% Large
All species except LP, TMX-CM, and IMX-CM (size Large)	Entry 5+	10% SS, 10% Small, 10% Medium, 70% Large

Management constraints

Constraints describe limitations on management that must be considered when scheduling treatments. The following discussion provides a description of the various constraints that were incorporated into the Spectrum model in response to forest plan direction and regulations and as a means of improving the model's ability to simulate actual management of NFS lands. Constraints as defined in the model were for modeling purposes only and do not create limitations for plan implementation.

Harvest policy

Harvest policy includes non-declining yield, long-term sustained yield, and ending inventory constraints. These constraints ensure that the timber yield is sustainable and will not decline in any decade.

Budget constraint

The model included a budget constraint in order to assess effects under current budget levels for timber management and reforestation activities. For the model's planning horizon, the annual budget constraint was \$4,051,000 and included all timber sale activities (timber sale preparation, timber sale administration, timber stand improvement, and reforestation) and construction/reconstruction engineering costs.

Snag retention

The silvicultural prescriptions for regeneration harvest included retention of trees for snag recruitment. Reserves of trees were required, and the snag quantities were tracked in the yield tables. Numbers of snags were reported for two diameter classes (10 to 19.9 inches and 20 inches or greater) for three densities, as shown in table 2-14.

Table 2-14. Snag density by diameter class

Diameter Class	Small Snag Density	Medium Snag Density	Large Snag Density
10 to 20-inch snags	0 to 5.9 snags/acre	6 to 9.9 snags/acre	≥ 10 snags/acre
20+-inch snags	0 to 0.9 snags/acre	1.0 to 3.9 snags/acre	≥ 4 snags/acre
Total snags	0 to 5.9 snags/acre	6.0 to 9.9 snags/acre	≥ 10 snags/acre

No prescribed burning in designated wilderness

To prevent prescribed burning in designated wilderness, prescribed burning in MAG1 was limited to the area of MAG1 in each alternative that was not management area 1a. The limits were no more than 348,317 acres in alternative B modified, no more than 546,935 acres in alternative C, and no more than 248,633 in alternative D.

Watershed objectives

Watershed objectives were met by limiting the amount of area that could be in an opening at one time. To protect watershed resources, the amount of area in openings is limited to not more than 25 percent by management area group. Management area group 1 is excluded from this constraint because openings in

MAG1 are created exclusively by natural processes and are therefore not a management limitation. Openings were modeled as follows:

- For regeneration harvest, stand-replacing prescribed burn, or stand-replacing wildfire, one acre of opening is created for each acre harvested or burned.
- For group selection or underburned prescribed burn, 0.2 acre of opening is created for each acre harvested or burned.

An opening remains an opening for 40 years, with a decay function over time to reflect the gradual recruitment of trees and recovery of the opening. During the first decade of harvest or burning, the opening equals 1.0, diminishing to 0.75 in decade 2, 0.50 in decade 3, and 0.25 in decade 4.

Wildlife objectives

Grizzly bear: In grizzly bear habitat within MAG4 (management area 6b), timber harvest was limited to no more than 5 percent per decade in core and 10 percent per decade in non-core. In grizzly bear habitat within MAG3 (which includes management area 6a), timber harvest was limited to no more than 2.5 percent per decade in core and 5 percent per decade in non-core. There was no limit in MAG2 for grizzly bear because of the already limited amount of acres that may be treated in those management areas.

Lynx: For lynx habitat, all stand-replacing fire and timber harvest was limited to no more than 15 percent per decade by management area group (with MAG1 excluded), and lynx habitat was not precommercially thinned.

For multistoried lynx habitat, timber harvest and prescribed burning was limited by management area group to no more than 60 percent of acres in cover types TMX-CM or IMX-CM within management area groups 3-5.

Whitetail deer (winter range): To manage for whitetail deer winter range, no more than 30 percent of the area (by management area group) would be in an opening. Openings are defined as one acre of opening for every one acre of regeneration harvest or stand-replacing wildfire. An opening remains an opening for 60 years, with a decay function over time. During the first decade of harvest or burning, the opening equals 1.0 acre, diminishing to 0.85 acre in decade 2, 0.70 acre in decade 3, 0.50 acre in decade 4, 0.35 acre in decade 5, and 0.20 acre in decade 6. After that, the stand fully functions as thermal cover.

Silvicultural prescriptions

To meet the intent of management intensity by management area group, silvicultural prescriptions for timber harvest were allocated by management area group as shown in table 2-15.

Table 2-15. Silvicultural harvest prescription by management area group

Management Area Group	Harvest Prescription
2	No limit; all available
3 or 4	At least 20% GS, remaining EA of all timber managed acres
5	At least 5% GS, remaining EA of all timber managed acres

Note. EA = even-aged management, GS = group selection (uneven-aged management).

Limits were placed on the amount of uneven-aged management and commercial thinning that could occur in the model. These constraints were developed because these treatments do not achieve the desired condition for larger opening sizes and because opportunities for these treatments are limited on the Forest.

The constraints represent how the Forest expects to implement the revised forest plan. The following silvicultural constraints were applied forestwide:

- Group selection was limited to no more than 5,000 acres per decade.
- Commercial thin was limited to no more than 10,000 acres per decade.

The assessment of the Flathead National Forest (USDA, 2014) indicates that only 70 acres of group selection and 7,348 acres of commercial thinning treatments occurred on the Forest from 2001 to 2012. Thus, these constraints are conservative limits compared to the actual treatments that have occurred on the Forest.

To further meet the intent of management intensity by management area group, acres treated by management area group were subject to the limitations shown in table 2-16.

Table 2-16. Limits to timber harvest by management area group

Management Area Group	Constraint
5	No constraint
4	No constraint
3	Limit to no more than 50% of all acres allocated to timber management
2	Limit to no more than 2,000 acres of timber harvest per decade

Prescribed burning was limited to no more than 7,500 acres per year because of operational and logistical limitations on the amount of burning the Forest can accomplish.

Disturbance processes—Stand-replacing wildfire

The amount of natural disturbance (stand-replacing fire) was determined using SIMPPLLE. Twenty simulations for 5 decades were made to estimate the amount of acres with fire disturbance. The resulting amount of stand-replacing fire was input into the Spectrum model by species and size class for each decade. Decades 1 through 5 used actual acres burned in the SIMPPLLE model, while decades six through 25 used an average of the first 5 decades. The acres reflect high-severity wildfire that is stand-replacing (not mixed- or light-severity burning) under the selected suppression scenario (50 percent suppression in wilderness, 100 percent in non-wilderness). For more information regarding the SIMPPLLE modeling, see Henderson (2017).

The acres shown in Table 2-17 and Table 2-18 were themed to stand-replacing fire over each decade. Acres vary by management area group, with 80 percent of disturbance occurring in management area groups 1-3 and 20 percent in management area groups 4-5.

Table 2-17. Natural disturbance (stand-replacing wildfire) by cover type

Spectrum Cover Type (Level 5)	Decade 1	Decade 2	Decade 3	Decade 4	Decade 5	Decade > 5 (Average)
IMX-WD	681	1,241	2,502	2,827	2,603	1,971
IMX-WM	474	702	1,234	959	930	860
IMX-CM	3,503	5,791	10,946	10,599	9,973	8,162
LP	11,048	14,194	16,666	14,372	11,497	13,555
TMX-WM	6	10	9	30	31	17

Spectrum Cover Type (Level 5)	Decade 1	Decade 2	Decade 3	Decade 4	Decade 5	Decade > 5 (Average)
TMX-CM	11,373	14,110	21,290	23,418	22,532	18,545
Total	27,085	36,048	52,647	52,205	47,566	43,110

Note. IMX-CM = Shade intolerant mix—Cool-moist, IMX-WD = Shade intolerant mix—Warm-dry, IMX-WM = Shade intolerant mix—Warm-moist, LP = lodgepole pine, TMX-CM = Shade tolerant mix—Cool-moist, TMX-WM = Shade tolerant mix—Warm-moist

Table 2-18. Natural disturbance (stand-replacing wildfire) by size class

Size Class (transition size)	Decade 1	Decade 2	Decade 3	Decade 4	Decade 5	Decade > 5 (Average)
Seedling/sapling	6,201	11,345	14,597	12,249	12,066	11,291
Small	9,524	5004	6,707	10,861	8,840	8,187
Medium	8,861	15,426	20,997	15,812	11,422	14,504
Large	2,499	4,273	10,346	13,283	15,238	9,128
Total	27,085	36,048	52,647	52,205	47,566	43,110

Management objectives

Linear programming models such as Spectrum optimize an objective function subject to a set of constraints. An objective function is defined in terms of its type, discount rate (if applicable), duration, and contributing activities and outputs. The constraints in the model are described in the previous section. The following discussion provides a description of the objective functions that were used for developing the model.

Objective to move towards desired condition

For the action alternatives, the objective function for the model was to move towards the desired condition for vegetation, as defined in the revised forest plan. The desired condition was defined by cover type and size class, and then goals were developed to achieve desired condition.

Table 2-19 and Table 2-20 display the goals for species and size class, respectively, based on the desired condition ranges for vegetation in the revised forest plan. These goals did not vary by alternative. In the model, every acre that is not within the desired condition minimum and the desired condition maximum is assigned a “penalty point.” Penalty points can accrue in any time period in the model but can become less as the forest moves toward desired conditions through time. The objective is to minimize total penalty points. Thus, alternatives with lower overall penalty points do a better job of moving vegetation towards desired conditions than those alternatives with higher penalty points.

Desired conditions were defined by cover type (forest dominance type) and size class. Goals were set to achieve desired conditions. Because of the greater importance of certain species and size classes, penalty points were doubled for white pine and ponderosa pine and for medium size.

Table 2-19. Species composition—Percent of all forested NFS acres

Forest Dominance Type	Forestwide Percentage to Maintain or Move Towards
Ponderosa pine	6%
Douglas-fir	18%
Western larch	18% (in order to improve the ability to find a solution, this goal was removed from the model because as it was easily achieved)
Lodgepole pine	15%

Forest Dominance Type	Forestwide Percentage to Maintain or Move Towards
TMX-CM (subalpine fir/spruce)	38 % (in order to improve the ability to find a solution, this goal was removed from the model because as it was easily achieved)
TMX-WM (grand fir/western red cedar)	2%
Western White Pine	3%

Note. TMX-CM = Shade tolerant mix—Cool-moist, TMX-WM = Shade tolerant mix—Warm-moist

Table 2-20. Species composition — percent of all forested National Forest acres

Size Class	Forestwide Percent to Maintain or Move Towards
Seedling/sapling (less than 5" d.b.h.)	24%
Small tree (5 to 9" d.b.h.)	20%
Medium tree (10 to 15" d.b.h.)	24%
Large tree (greater than 15" d.b.h.)	32%

Note. d.b.h. = diameter at breast height.

Objective to maximize timber

For alternatives A and D, the model was run with an objective function to maximize timber output levels in the first decade. For alternative D, the results were then ‘rolled over’ (the first-decade harvest levels were input as a constraint) and the model was rerun with the objective of moving towards vegetation desired condition.

Results of Spectrum Modeling

Table 2-21 displays the objective functions used to run each alternative and certain key outputs: production of timber in both million board feet (mmbf) and million cubic feet (mmcf) in the first decade with a budget constraint; the number of acres managed for timber production over the planning horizon with a budget constraint; timber budget in the first decade; production of timber in both million board feet and million cubic feet in the first decade without a budget constraint; the number of acres managed for timber production over the planning horizon without a budget constraint; the unconstrained timber budget in the first decade, and the desired future condition penalty scores with and without budget constraints.

Table 2-21. Timber harvest, acres managed, and budget by alternative

Item	Units	Time Frame	Alternative A	Alternative B Modified	Alternative C	Alternative D
Objective Function	N/A	-	Maximum Timber	Desired Condition	Desired Condition	Maximum Timber/ Desired Condition
Sawtimber Meeting Utilization Standards with Limited Budget	mmbf	decade 1	28.2	27.3	18	29.2
Sawtimber Meeting Utilization Standards with Limited Budget	mmcf	decade 1	5.8	5.5	3.9	5.9
Budget (Limited)	mm\$	decade 1	4.1	4.1	2.8	4.1

Item	Units	Time Frame	Alternative A	Alternative B Modified	Alternative C	Alternative D
Acres Allocated to Timber Management with Limited Budget	acres	model horizon (250 years)	463,773	398,758	312,426	334,990
Sawtimber Meeting Utilization Standards with Unlimited Budget	mmbf	decade 1	52.4	38	18	63.5
Sawtimber Meeting Utilization Standards with Unlimited Budget	mmcf	decade 1	10.8	7.6	3.9	13
Budget (Unlimited)	mm\$	decade 1	7.6	5.5	2.8	9.1
Acres Allocated to Timber Management with Unlimited Budget	acres	model horizon (250 years)	471,661	421,823	361,040	436,182
DFC Score with Limited Budget	penalty points	model horizon (250 years)	N/A	18,485,458	23,129,453	23,988,325
DFC Score with Unlimited Budget	penalty points	model horizon (250 years)	N/A	18,234,206	22,823,416	23,560,374

Note. DFC = desired future condition, mmbf = million board feet, mmcf = million cubic feet, mm\$ = million U.S. dollars.

Table 2-21 indicates that alternative B modified does the best job at achieving the desired future condition of the action alternatives. Alternative D harvests the most timber of the alternatives but has the worst desired future condition score of the action alternatives. The desired future condition penalty points was not calculated for alternative A as it was not run with this objective function.

Sensitivity analysis

A sensitivity analysis was conducted to examine the trade-offs caused by the constraints and determine whether the Spectrum model is working correctly. For the sensitivity analysis, a total of 15 runs were made to test the major features and the effect of various constraints on the results. All sensitivity analysis runs used the acres and analysis units from alternative B (from the draft EIS). The results would be similar for all alternatives. All runs were made with the objective to move towards vegetation desired future condition.

A set of four calibration runs was made to test the major features of the model. A set of three baseline runs was then made to identify extreme solutions and establish comparison points for measuring the effects of tested constraints. Finally, a set of eight sensitivity runs was made to test the effect of individual or a set of constraints on the model results.

An additional sensitivity analysis run was made between the draft and the final EIS to determine the effect of the higher-intensity timber management that occurs under management area 6c. Sensitivity run 8 was made using the analysis areas from alternative D, which has a greater amount of management area 6c than the other alternatives, and running the model with the same objective function as alternative B, to move towards the vegetation desired future condition. The results of this sensitivity analysis run (sensitivity run 8) were then compared to the results of alternative B modified to understand the increased timber production that would be possible under management area 6c.

Table 2-22 displays a brief description of the runs that were made for the sensitivity analysis and the purpose of each run.

Table 2-22. Type, description, and purpose of sensitivity analysis modeling runs

Run Type	Run Description	Purpose of Run
Calibration Run 1 (CR 1)	No constraints; all management regimes allowed on all acres, including (unlimited) wildfire	Calculates the “best” (lowest) DFC score the model can derive, although unrealistic
Calibration Run 2 (CR 2)	No constraints; all management regimes on all acres but with no wildfire	Shows the best DFC score when wildfire is not part of the vegetation model
Calibration Run 3 (CR 3)	No constraints; all management regimes on all acres; wildfire constrained to projections	Shows the best DFC score when wildfire is part of the vegetation model
Calibration Run (CR 4)	Adds harvest policy constraints (NDY ≤ LTSY in perpetuity) to CR 3	Demonstrates the effect of harvest flow constraints on the vegetation model
Baseline Run 1 (BR 1)	DFC baseline with minimal constraints (harvest policy; silvicultural restrictions by MA group)	Calculates a baseline for comparing all sensitivity runs
Baseline Run 2 (BR 2)	No management baseline (no vegetation management and no wildfire)	Calculates a DFC score resulting from no vegetation management
Baseline Run 3 (BR 3)	Maximum volume baseline (BR 1 with maximum cubic feet volume all decades)	Calculates the highest sustainable harvest level for comparison to BR 1
Sensitivity Run 1 (SR 1)	Adds watershed opening constraints to BR 1	Measures the effect of constraints on watershed openings
Sensitivity Run 2 (SR 2)	Adds lynx constraints to BR 1	Measures the effect of constraints on lynx habitat
Sensitivity Run 3 (SR 3)	Adds winter range constraints to BR 1	Measures the effect of constraints on big game winter range
Sensitivity Run 4 (SR 4)	Adds grizzly bear constraints to BR 1	Measures the effect of constraints on core and non-core grizzly bear habitat
Sensitivity Run 5 (SR 5)	Adds silvicultural limit constraints for group selection, commercial thinning, and prescribed burning to BR 1	Measures the effect of silvicultural limits on the amount of group selection, commercial thinning, and prescribed burning
Sensitivity Run 6 (SR 6)	Adds MA group level group selection treatment mix constraints to BR 1	Measures the effect of limits on uneven-aged management within MA groups
Sensitivity Run 7 (SR 7)	Adds budget constraints to BR 1	Measures the effect of budget constraints
Sensitivity Run 8 (SR 8)	Runs alternative D with objective of maximizing vegetation DFC	Measures the effect of greater intensity timber production in MA 6c by comparing results with alternative B using the same objective function

Note. DFC = desired future condition, LTSY = long-term sustained yield, MA = management area, NDY = non-declining yield.

Table 2-23 displays the results of the sensitivity analysis for selected outputs for the calibration runs and sensitivity run 1 through sensitivity run 7. The results of sensitivity run 8 are shown in table 2-24. This table indicates the best desired future condition score is attained under calibration run 1, with the most flexibility in management and no constraints. The desired future condition score is greatly affected by a lack of management, with the worst desired future condition score occurring under the second baseline run, no management. The analysis also indicates that the desired future condition is not greatly affected by any one set of constraints in the model, as shown in the results for each sensitivity run (i.e., sensitivity run 1 through sensitivity run 8).

Table 2-23 also indicates the timber harvest levels are most affected under sensitivity run 7, the budget constraints, and sensitivity run 4, the grizzly bear constraints. These constraints have the largest impact on timber harvest.

Calibration run 4 demonstrates that the harvest policy constraints have an impact on the quantities of timber harvest for each decade but do not have a large impact on the desired future condition score. Because the harvest policy constraints do not greatly affect the desired future condition score, there should be no need to consider a departure from these constraints in order to achieve desired future conditions more quickly.

Table 2-23. Sensitivity analysis results—Desired future condition score and other selected outputs for decades 1, 2, and 3

Run	DFC Score	Timber Harvest mmbf/year			Commercial Thinning (acres/year)			Regeneration Harvest (acres/year)			Group Selection (acres/year)			Prescribed Burning (acres/year)			Budget (million dollars/year)		
		Dec. 1	Dec. 2	Dec. 3	Dec. 1	Dec. 2	Dec. 3	Dec. 1	Dec. 2	Dec. 3	Dec. 1	Dec. 2	Dec. 3	Dec. 1	Dec. 2	Dec. 3	Dec. 1	Dec. 2	Dec. 3
CR 1	7,113,318	100.8	0.0	20.7	29,059	-	-	-	-	-	26,887	-	7,726	905	-	-	43.6	0.3	11.1
CR 2	14,009,659	96.0	0.4	11.4	24,011	-	-	817	1,503	323	25,845	-	1,077	582	-	-	41.8	2.8	2.0
CR 3	12,758,944	68.7	0.0	0.0	26,803	-	-	-	-	-	22,082	-	-	905	-	-	35.9	0.2	0.0
CR 4	12,843,184	31.5	29.9	29.9	18,608	-	-	-	-	-	19,323	3,387	2,950	905	-	-	29.2	5.5	5.1
BR 1	14,920,756	56.1	57.0	57.4	2,376	1,213	950	-	1,602	1,604	5,970	2,272	2,369	4,510	-	2,252	8.7	8.4	8.4
BR 2	54,215,332	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0
BR 3	43,976,926	89.3	89.5	94.6	156	156	3,277	44	44	4,016	7,664	7,048	2,755	-	-	-	13.3	13.5	13.7
SR 1	14,920,924	56.2	57.2	57.7	2,376	1,239	923	-	1,600	1,704	5,983	2,278	2,251	4,510	-	2,247	8.7	8.6	8.3
SR 2	15,769,562	41.7	42.8	43.2	7,707	2,012	200	-	2,050	3,718	1,731	304	-	4,219	-	2,466	6.6	6.2	6.3
SR 3	14,922,346	55.7	56.7	56.9	2,376	1,121	1,041	-	1,604	1,408	5,946	2,272	2,587	4,510	-	2,262	8.6	8.4	8.4
SR 4	15,428,139	33.7	33.9	34.8	6,250	2,286	1,124	-	1,088	1,898	1,600	1,303	-	5,518	-	2,390	5.4	5.2	5.0
SR 5	15,538,861	56.5	56.5	57.2	1,000	1,000	1,000	2,591	2,759	3,418	500	500	500	-	3,163	3,706	8.1	8.1	8.2
SR 6	14,972,802	56.7	56.1	62.3	4,649	200	200	1,039	721	3,724	4,613	3,209	-	4,510	-	2,623	8.8	8.3	8.9
SR 7	15,563,233	24.7	26.1	27.9	8,740	3,650	33	-	426	2,436	-	1,134	-	6,840	-	2,858	4.1	4.1	4.1
SR 8	16,878,588	27.7	27.7	27.9	1,000	1,000	1,000	1,378	1,623	1,924	-	-	-	492	3,834	4,995	4.1	4.1	4.1

Note. BR = baseline run, CR = calibration run, Dec. = Decade, DFC = desired future condition, mmbf = million board feet, SR = sensitivity run.

Table 2-24 compares the results of sensitivity run 8 with the results of alternative B. Both runs were made with unlimited budgets. The results indicate the output levels with an allocation to management area 6c rather than management area 6b results in an increased projected timber sale quantity of 3.5 million board feet or an approximately 10 percent increase in timber production over alternative B.

Table 2-24. Timber harvest, acres managed, and budget for sensitivity run 9 compared to draft EIS alternative B

Item	Units	Time Frame	Alternative B from Draft EIS	Sensitivity Run 8
Objective Function	n/a		Desired Condition	Desired Condition
Sawtimber Meeting Utilization Standards with Unlimited Budget	mmbf	Decade 1	38.4	41.9
	mmcf	Decade 1	7.7	8.4
Budget (Unlimited)	mm\$	Decade 1	5.6	6.1
Acres Allocated to Timber Management with Unlimited Budget	Acres	Model Horizon (250 years)	415,294	420,548

Note. mmbf = million board feet, mmcf = million cubic feet, mm\$ = million U.S. dollars.

SIMPPLLE Modeling Results of Vegetation Change over Time

This section of the appendix displays outputs for the vegetation characteristics as modeled with SIMPPLLE. For projection of vegetation conditions into the future, multiple simulations were run with the same natural ecological processes and disturbances parameters as was included in the natural range of variation analysis, but assuming a fire suppression logic similar to current practice, and adding in the projected harvest and prescribed burn treatment outputs from the Spectrum model. Vegetation conditions were projected out through five timesteps (5 decades) under a “warm dry” climate scenario. Thirty iterations of the model were run to capture the variability and inherent uncertainties that would occur with timing and location of disturbance events (such as fire). This variability is reflected as a range in the vegetation characteristics that result by the fifth decade.

Fire, insects, disease, and timber harvest are the disturbances that impact vegetation change in the model, interacting with climate and vegetative succession, over the five decade modeling period. As discussed earlier, though best available science and professional knowledge are used to develop the model, we cannot know with certainty the location, timing or pattern of fire and insect/disease events. Similarly, exact locations and timing of anticipated harvest treatments cannot be predicted with certainty. Model projections portray a possible outcome based on our best efforts, and are most useful to provide comparative rather than absolute values. Because of the variation in existing vegetation condition values between Forest Inventory and Analysis and VMap (see Trechsel, 2016a for details), an adjustment factor was applied to the SIMPPLLE outputs in order to provide a proper comparison to the desired condition for the vegetation attribute.

Figure 2-2 displays the range in acres as averaged across all alternatives across the 5-decade modeling period. Information on the modeling aspects for each of the disturbance types follows. Additional information on disturbances and treatments can be found in section 3.3.2 in the final EIS.

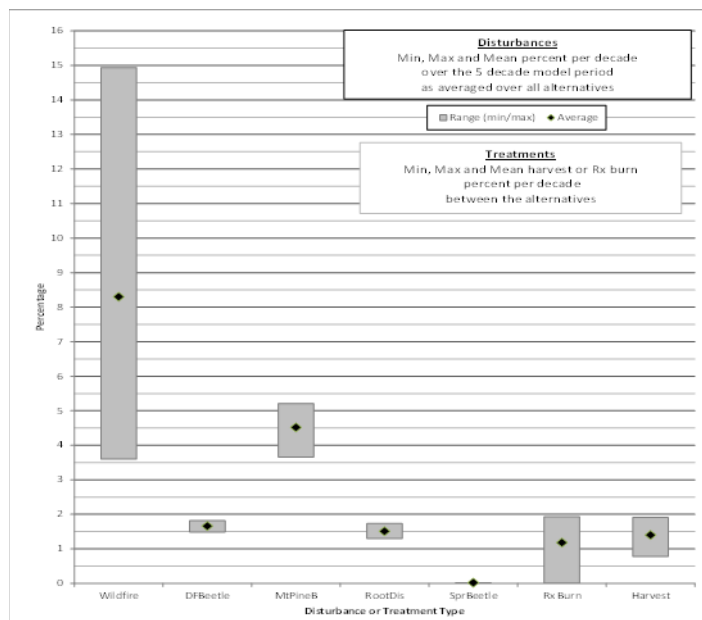


Figure 2-2. The average mean, minimum, and maximum percent per decade of Forest area affected by different disturbances and treatments, as modeled over a 5-decade future period.

Wildfire

The effects of future climate on fire activity is one of the major uncertainties, and it is unclear whether there will be a continuation in the current trend, an increase, or even a potential decrease in fire activity as the future forest may not sustain the requisite fuel loads to continue burning at current levels. Therefore, a “Future Range of Variation” was evaluated in the model that included runs with the current trend as well as increased and decreased fire activity as driven by climatic variables. Results of this analysis are displayed in figure 2-3, which shows the minimum, maximum, and average amount of fire modeled for each alternative. In the figure, none of the lines represent all data from a single run; it is likely, for instance, that five separate runs were used to represent the maximum fire line (e.g., a different run for each time period). Therefore, the wildfire acres displayed in the figure do not imply an “even flow” of acres burned over time. Most (over 90 percent) are stand-replacing fires. The model simulations reflect the reasonable assumption that under warmer climate periods, drier conditions would also occur, and therefore a higher amount of fire could be expected across the landscape when compared to normal climatic periods.

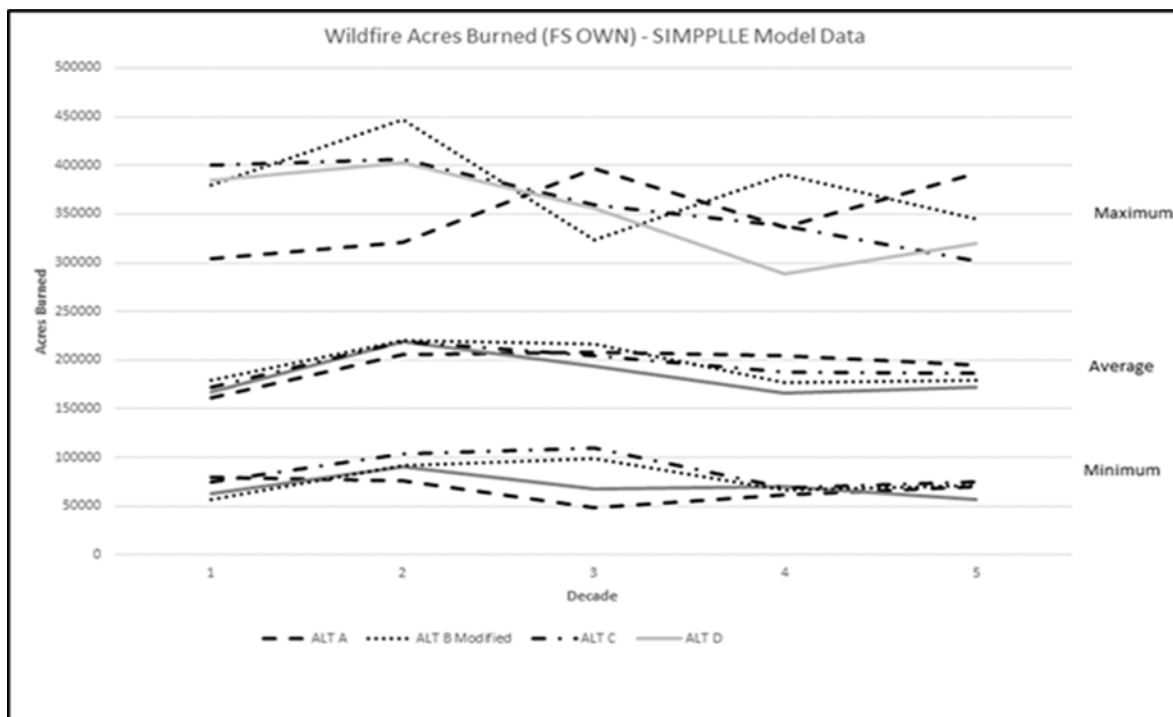


Figure 2-3. SIMPPLLE model outputs over the 5-decade future model period for minimum, maximum, and average acres of total fire (90+ percent stand-replacement severity) by alternative, for NFS lands.

Insect and Diseases

As seen in Figure 2-4 to Figure 2-7, insects and disease, particularly the bark beetle, will play a role in influencing vegetation conditions over the next 5 decades. Mountain pine beetle mainly affects forests dominated by lodgepole pine, particularly those in the medium and large size classes. Douglas-fir beetle affects Douglas-fir, mostly by removal of the very large and large tree sizes and an associated drop to smaller forest size classes, decreases in density, and sometimes a shift in species composition. Root disease also plays a major role in influencing stands where Douglas-fir occurs, with similar results in reducing density and sometimes size class as well as potentially shifting species composition. Subalpine fir and grand fir are also affected by root disease in similar ways. Spruce beetle is present, but the model results suggest that the forest and landscape conditions that support high beetle population levels will be uncommon on the Flathead over the next 5 decades.

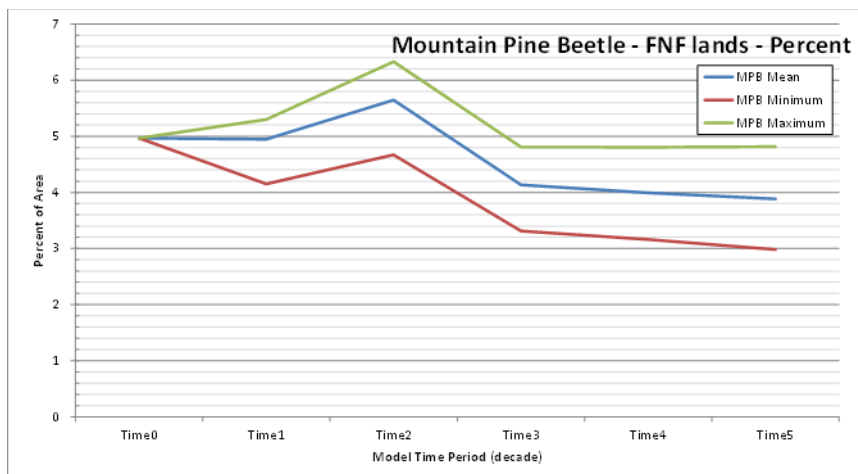


Figure 2-4. Mountain pine beetle activity as projected over the next 5 decades.

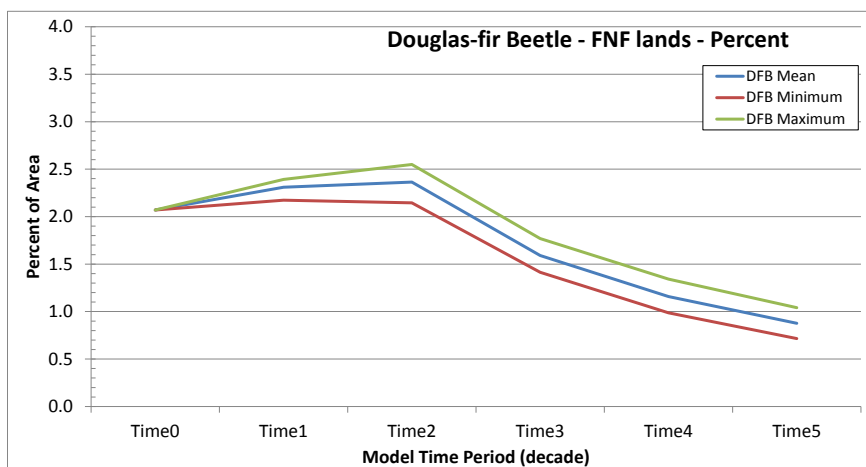


Figure 2-5. Douglas-fir beetle activity as projected over the next 5 decades.

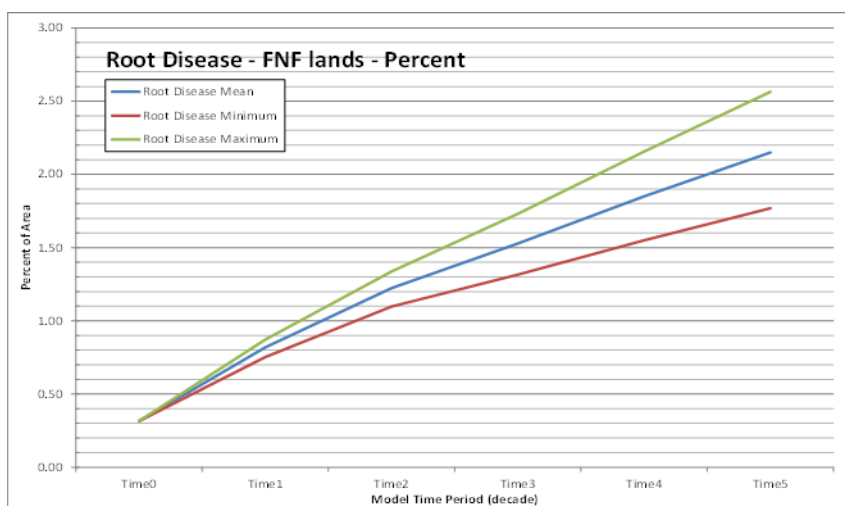


Figure 2-6. Root disease activity as projected over the next 5 decades.

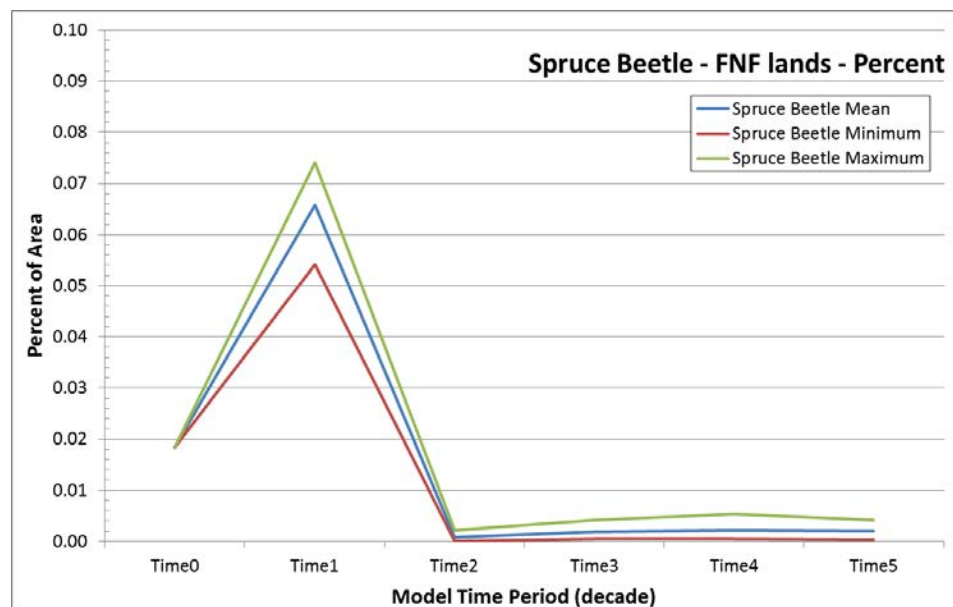


Figure 2-7. Spruce beetle activity as projected over the next 5 decades.

Prescribed Fire

This is a management treatment, projected by the Spectrum model, that is allowed to be applied (in the model) across all areas of the Forest except within designated wilderness areas or within the grand fir/cedar dominance type on the warm-moist potential vegetation type. Table 2-25 displays modeled acres of prescribed fire by each action alternative as averaged over the 5-decade period. Approximately one quarter of these acres are low-severity underburns, with a similar proportion between the alternatives. These occur primarily in the warm dry potential vegetation type where early successional fire-resistant species occur. The remainder are moderate- to high-severity burns applied primarily in the cool-moist potential vegetation type but also in the cold type. No prescribed fire is modeled to occur in alternative A because the existing plan has no specific objectives or direction related to implementation of prescribed fire. However, in reality, prescribed fire is and would continue to be used as a tool to achieve desired vegetation and fuel conditions under the current plan, similarly as might occur under the action alternatives.

Currently, the Forest conducts prescribed burns on about 2,500 acres per year on average (i.e., 25,000 acres per decade). The model estimates the potential for more acres of prescribed burning over the next 5 decades on average. This may be an overestimation of the amount of acres that would actually be reasonably implemented due to anticipated limitations on burning in lynx habitat (multistory forest) as well as logistical considerations. However, prescribed fire is also anticipated to become an increasingly important tool for management of forest conditions and landscape patterns to maintain or improve desired ecosystem resilience. Refer to appendix A of the forest plan for lynx direction and to the Vegetation section of the final EIS for additional information. Refer also to Trechsel (2017b) for graphs displaying treatments over time.

Timber Harvest

Harvest as modeled in Spectrum is of three general types: regeneration, commercial thinning, and group selection. In regards to effects to vegetation in the modeling process, regeneration harvest results in the removal of most existing trees, changing the forest size class to seedling/sapling. Subsequent reforestation (planting or natural regeneration) occurs, and in some cases this results in altering the original species

composition and/or forest density class. Commercial thinning removes a portion of the existing trees, which mainly results in reduced forest density but may also increase size class and change forest composition. Group selection harvest reduces stand densities and tends to maintain or increase the shade-tolerant tree species (e.g., grand fir, subalpine fir) as compared to shade-intolerant species because of the small openings and denser forest canopy conditions that are not as conducive to establishment and development of shade-intolerant species.

Table 2-25 displays the model results in acres per decade of harvest and prescribed burn treatments by alternative, as averaged across the 5-decade future model period. Trechsel (2017b) contains graphs that display the change across the 5-decade time period. The acres harvested and prescribed burned fluctuate over this period as influenced by the internal workings of the Spectrum model and how it chooses to apply particular treatments to achieve objectives while meeting all the management constraints (refer to previous section, which provides details on the Spectrum model components). Though vegetation conditions are a factor that drives model assignment of treatment types and timing, it are broad generalizations of what is actually a very diverse and site-specific determination in the real world. The precise acres and pattern of treatment types over time resulting from the model should not be given undue significance because it is the actual on-the-ground situation, with all its complexities, that will determine exactly where and which treatments would be applied. However, the model outputs do provide a useful and reasonable assessment of the influence of harvest and prescribed burning and a valid comparison of the relative difference between alternatives. Treatments projected by the model over the 5-decade period were input into the SIMPPLLE model, where, in combination with natural disturbances and succession, they influenced changes in vegetation conditions over the time period (these are summarized in the next section).

Table 2-25. Average acres per decade^a of commercial harvest and prescribed fire treatments over the 5-decade future model period, by alternative.

Commercial Harvest and Prescribed Fire	Alternative A	Alternative B Modified	Alternative C	Alternative D
HARVEST				
Group Selection	5,068	0	8,089	2,998
Commercial Thinning	0	30,891	25,554	13,774
Even-Aged Harvest	13,625	14,906	5,263	13,710
Total Commercial Harvest	18,693	45,798	38,906	30,481
PRESCRIBED FIRE				
Low Severity (Underburn)	0	10,111	9,826	8,794
Moderate/High Severity	0	35,998	39,230	32,528
Total Prescribed Fire	0	49,109	49,056	41,322

a. Acres of input as allocated spatially across the Flathead National Forest by the SIMPPLLE model (original source of acres is from Spectrum modeling)

Quantitative Results and Comparison

Figure 2-8 through figure 2-27 provide a summary of the quantitative results of the analysis of change in vegetation as modeled with SIMPPLLE, using treatments as projected in the Spectrum model and the natural disturbance processes (fire and insects and disease) and vegetative succession as projected within the SIMPPLLE model. The results are displayed as a range in the proportion of area at timestep 5 (the fifth decade) for each alternative. The current condition of the vegetation attribute (from the Forest Inventory and Analysis Hybrid 2011 database) and the desired condition are displayed in these figures for comparison. Refer to Trechsel (2016a) for information on how desired conditions were developed. Graphs displaying the vegetation conditions by decade as they change across the 5-decade model period are provided in USDA (2017). Taken together, the figures and graphs provide the detailed output results that were used to inform the effects analysis and comparison of alternatives disclosed in section 3.3 (Vegetation) of the final EIS. Since desired conditions in the plan for vegetation components are provided both at the forestwide scale and by potential vegetation type (depending on the particular attribute), the future vegetation conditions were analyzed at these two scales to allow for comparison.

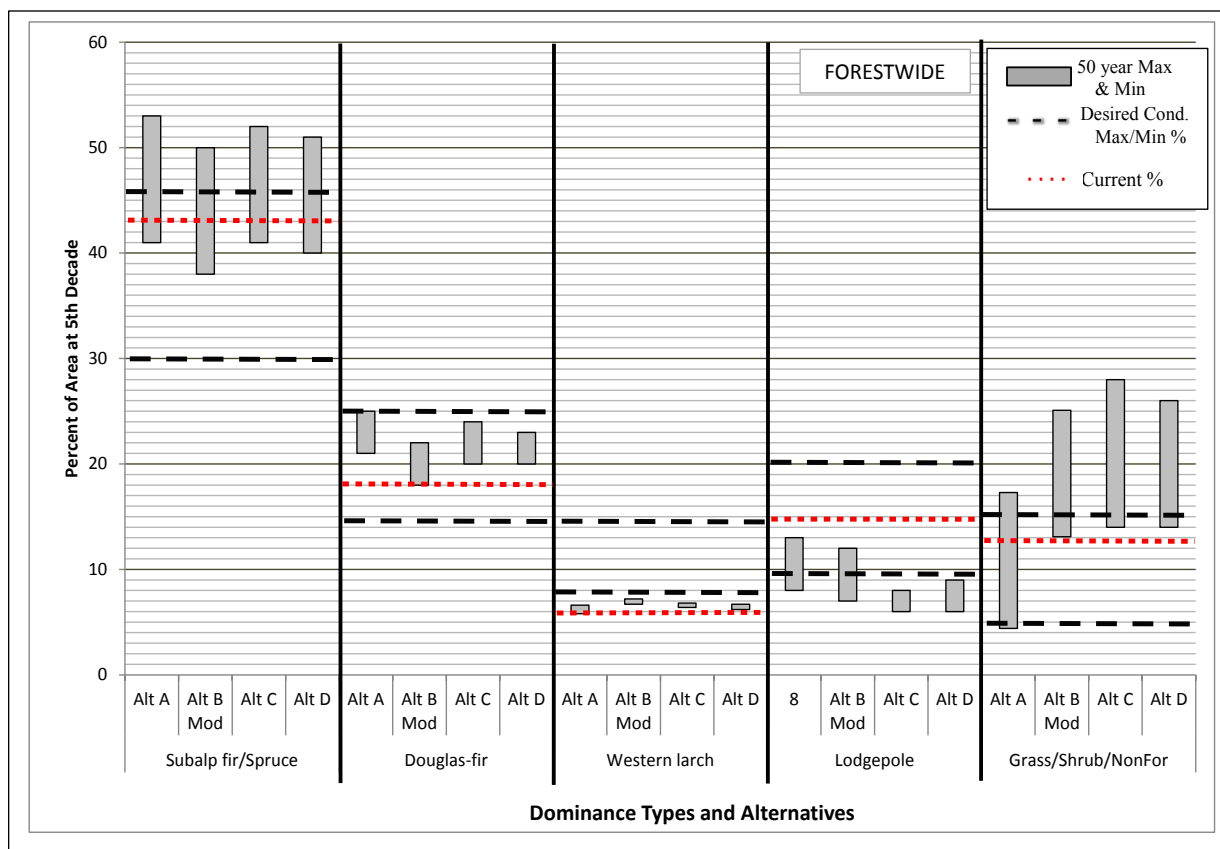


Figure 2-8. Modeled vegetation dominance types (major species) forestwide at decade 5.

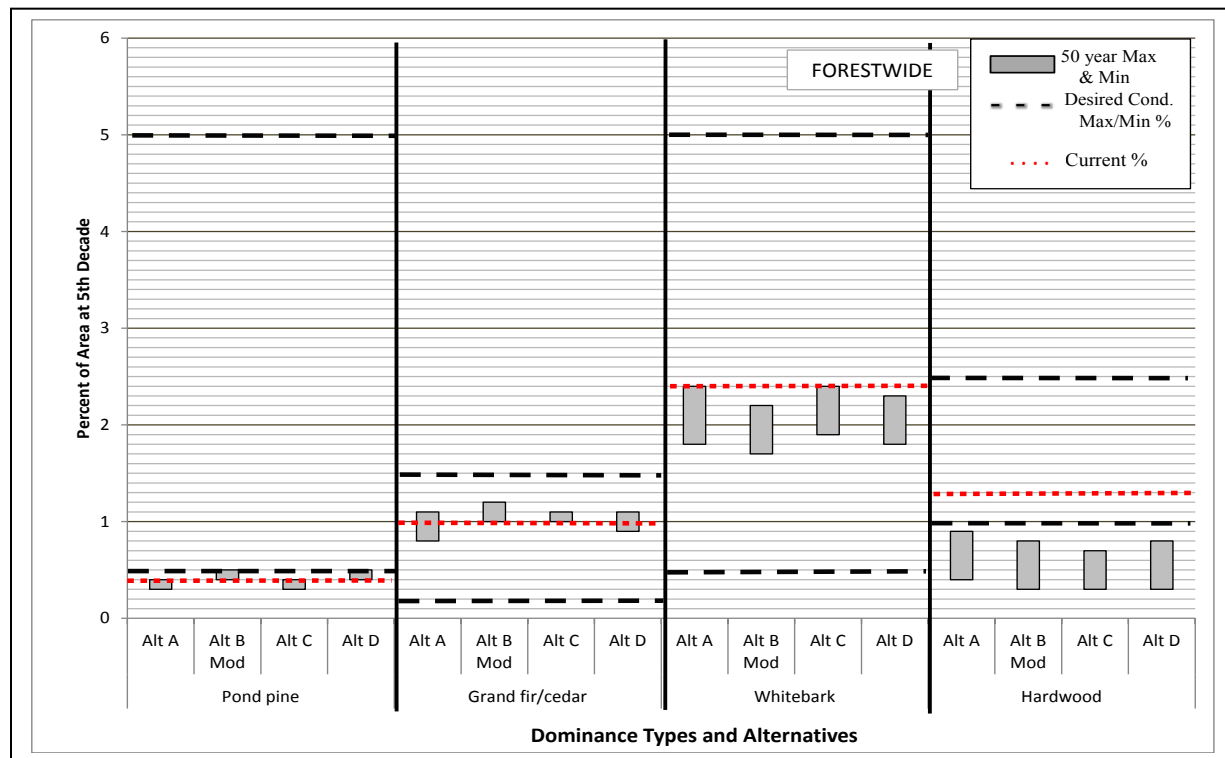


Figure 2-9. Modeled vegetation dominance types (minor species) forestwide at decade 5.

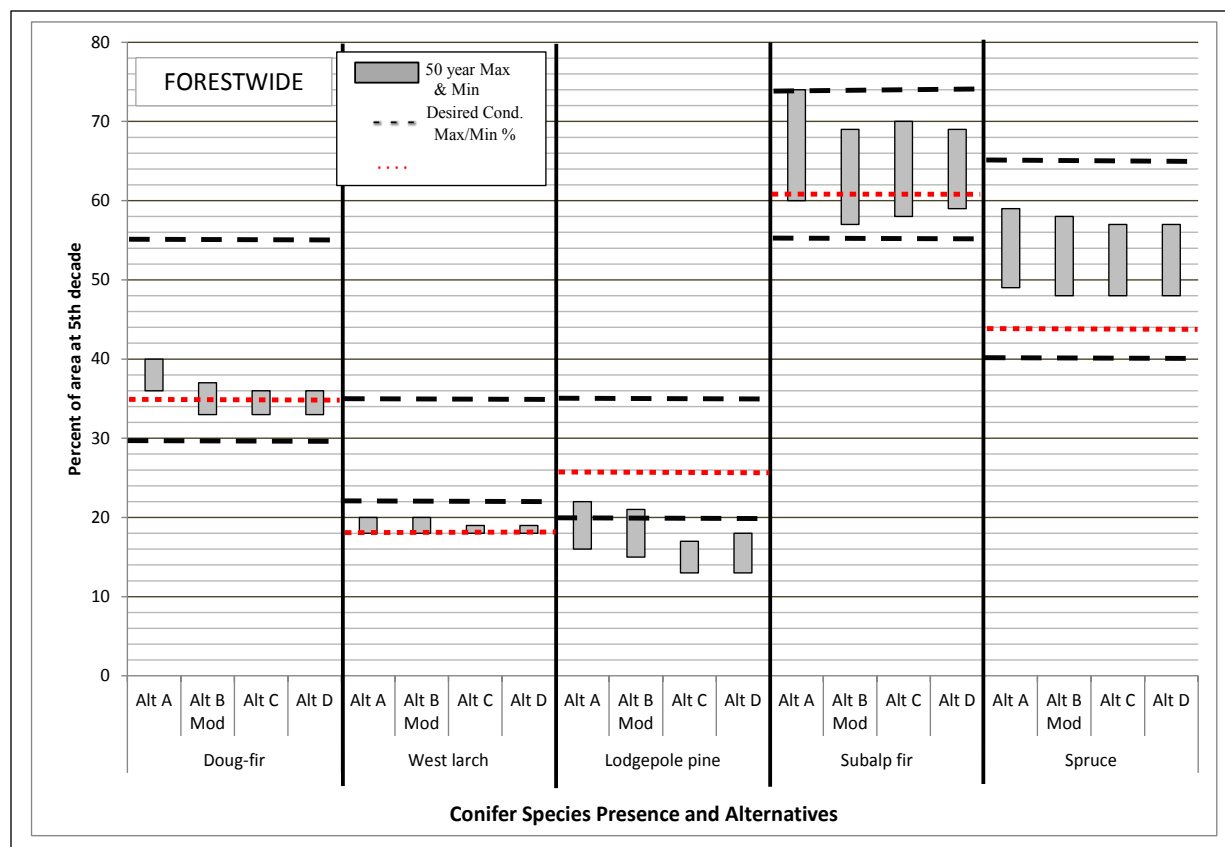


Figure 2-10. Modeled conifer species presence (major species) forestwide at decade 5.

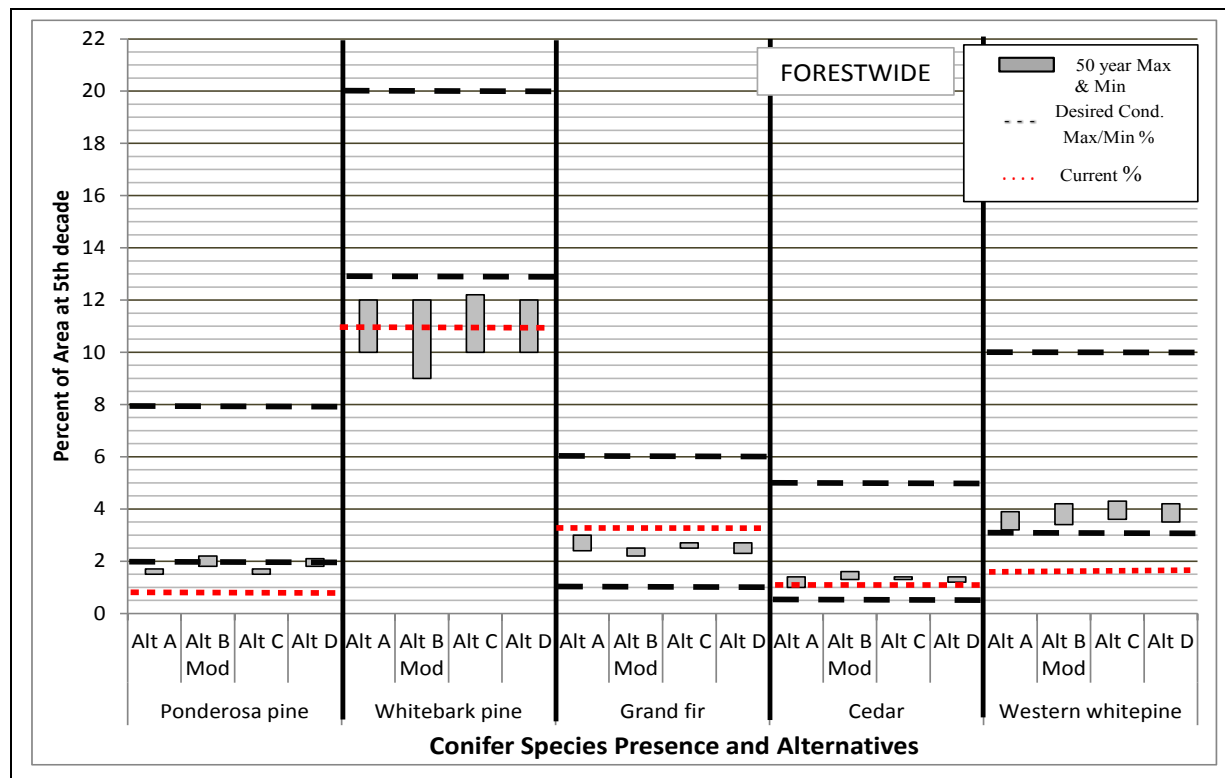


Figure 2-11. Modeled conifer species presence (minor species) forestwide at decade 5.

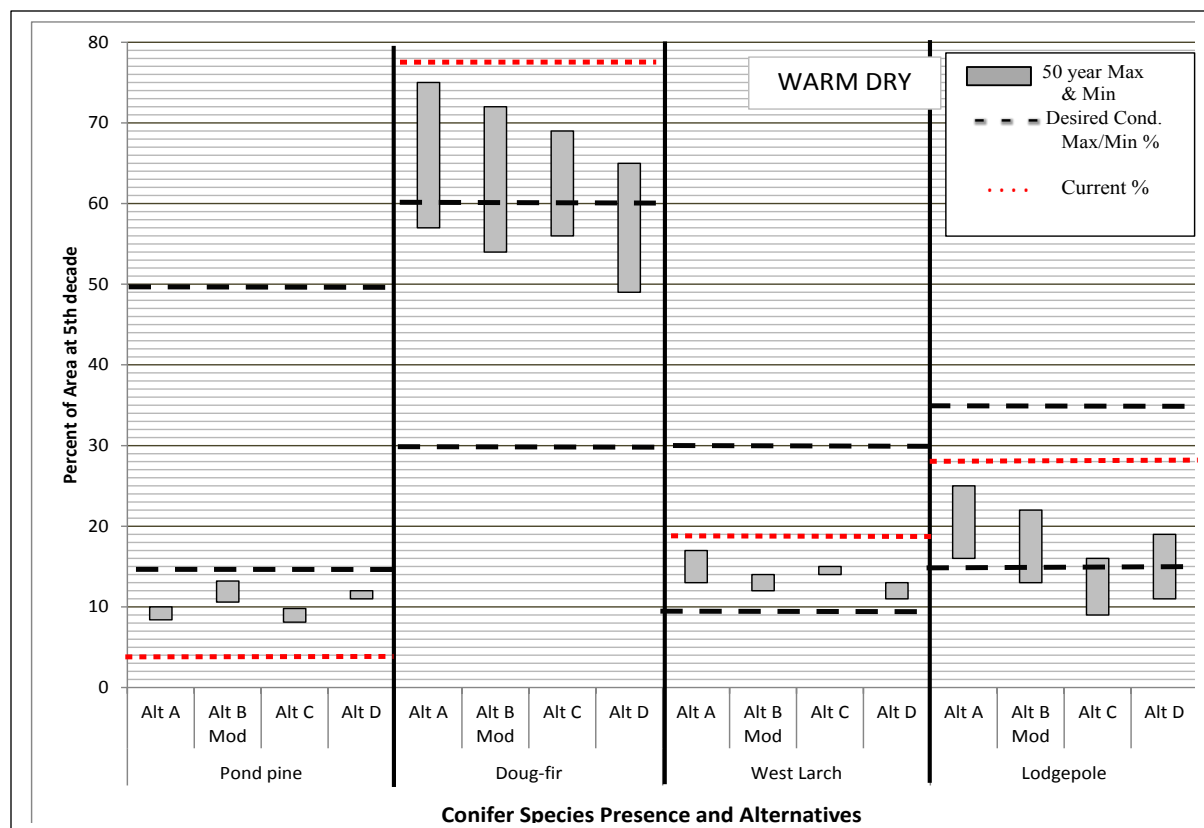


Figure 2-12. Modeled conifer species presence in the warm-dry broad potential vegetation type group at decade 5.

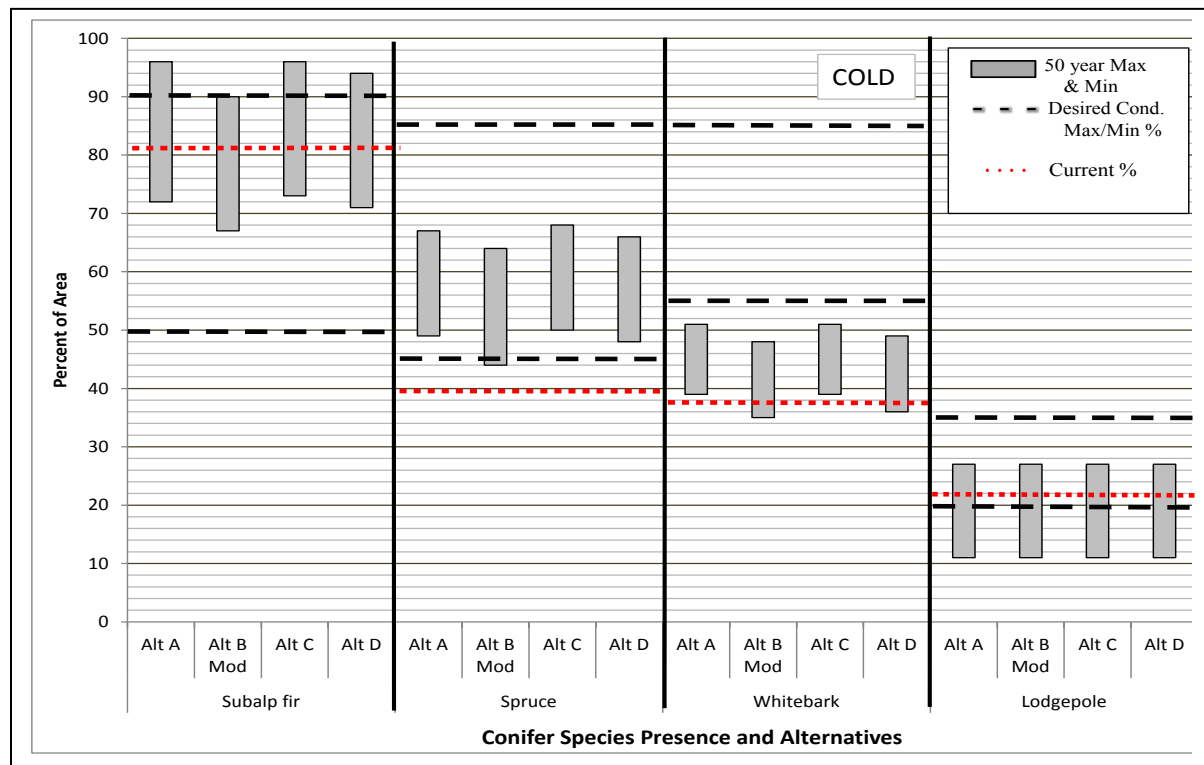


Figure 2-13. Modeled conifer species presence in the cold broad potential vegetation type group at decade 5.

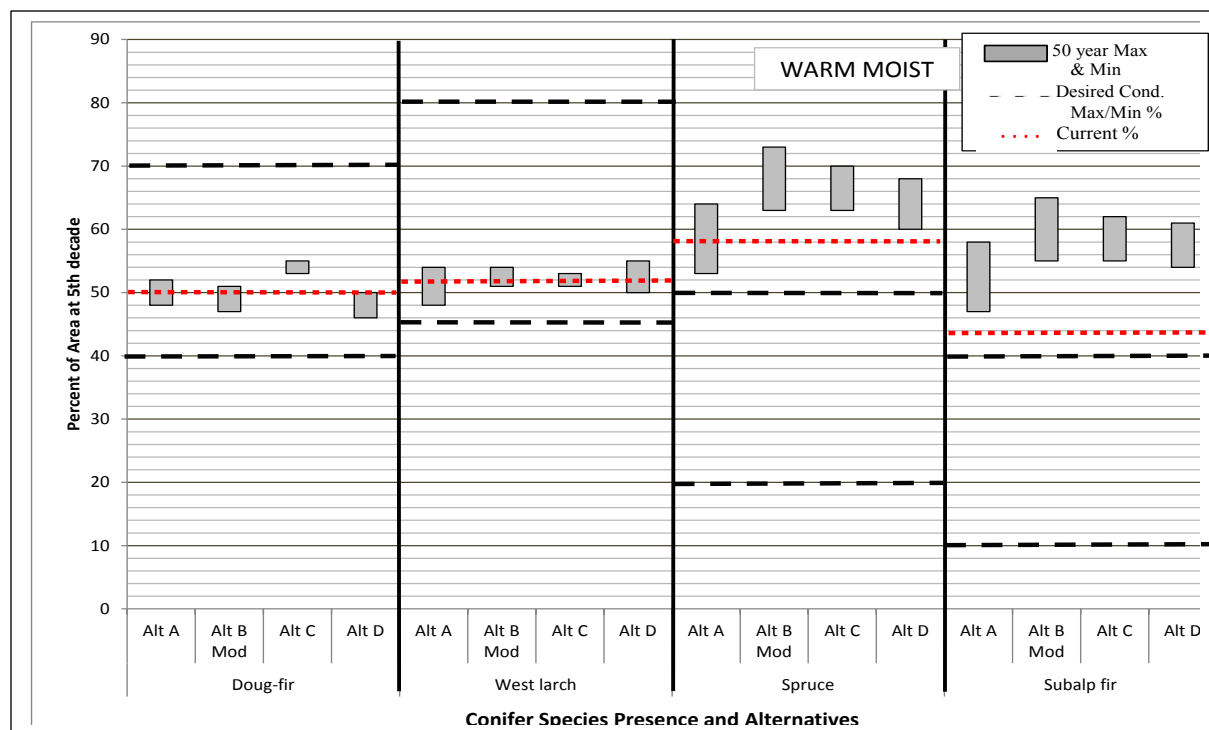


Figure 2-14. Modeled conifer species presence (major species) in the warm-moist broad potential vegetation type group at decade 5.

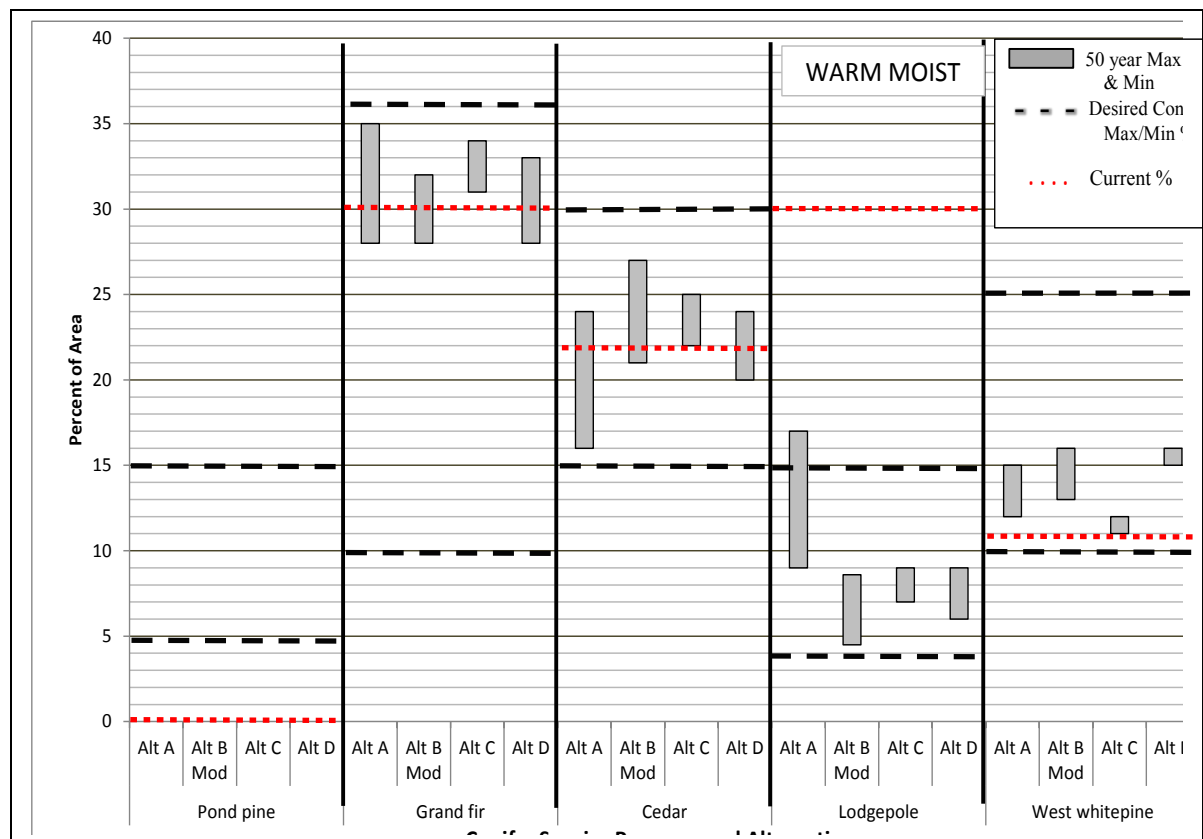


Figure 2-15. Modeled conifer species presence (minor species) in the warm-moist broad potential vegetation type group at decade 5.

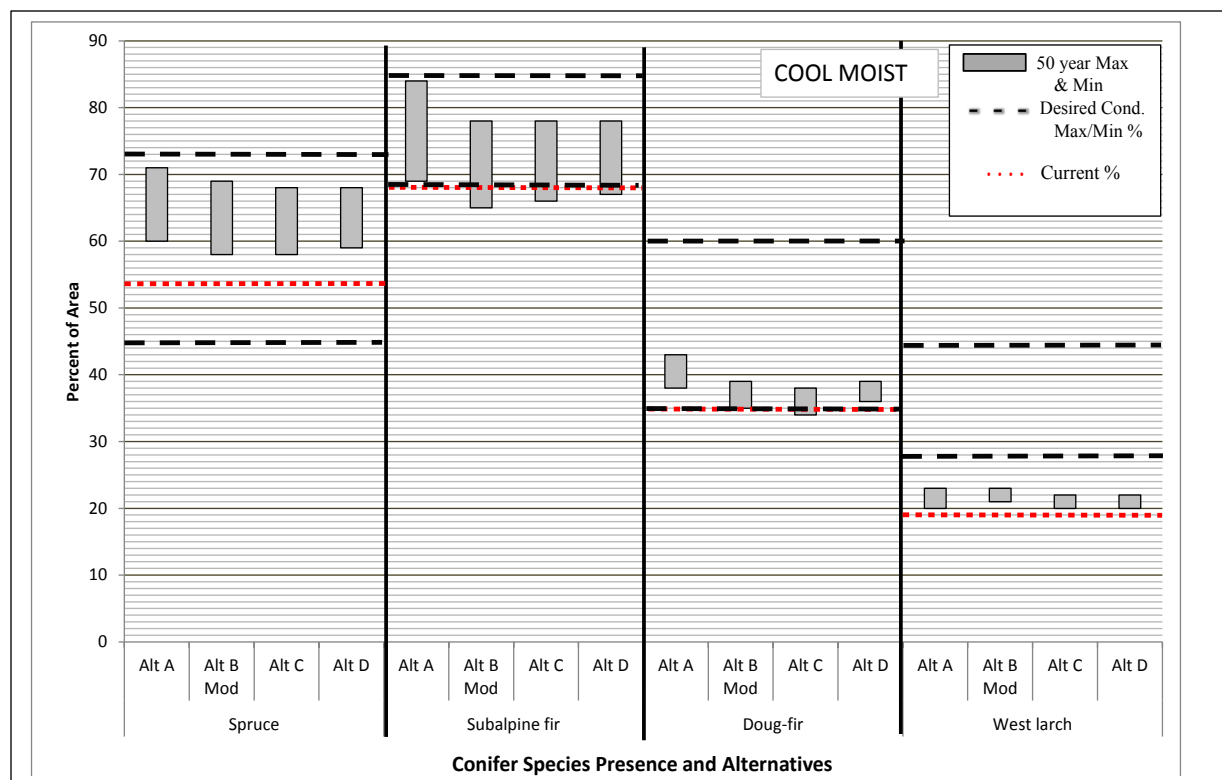


Figure 2-16. Modeled conifer species presence (major species) in the cool-moist broad potential vegetation type group at decade 5.

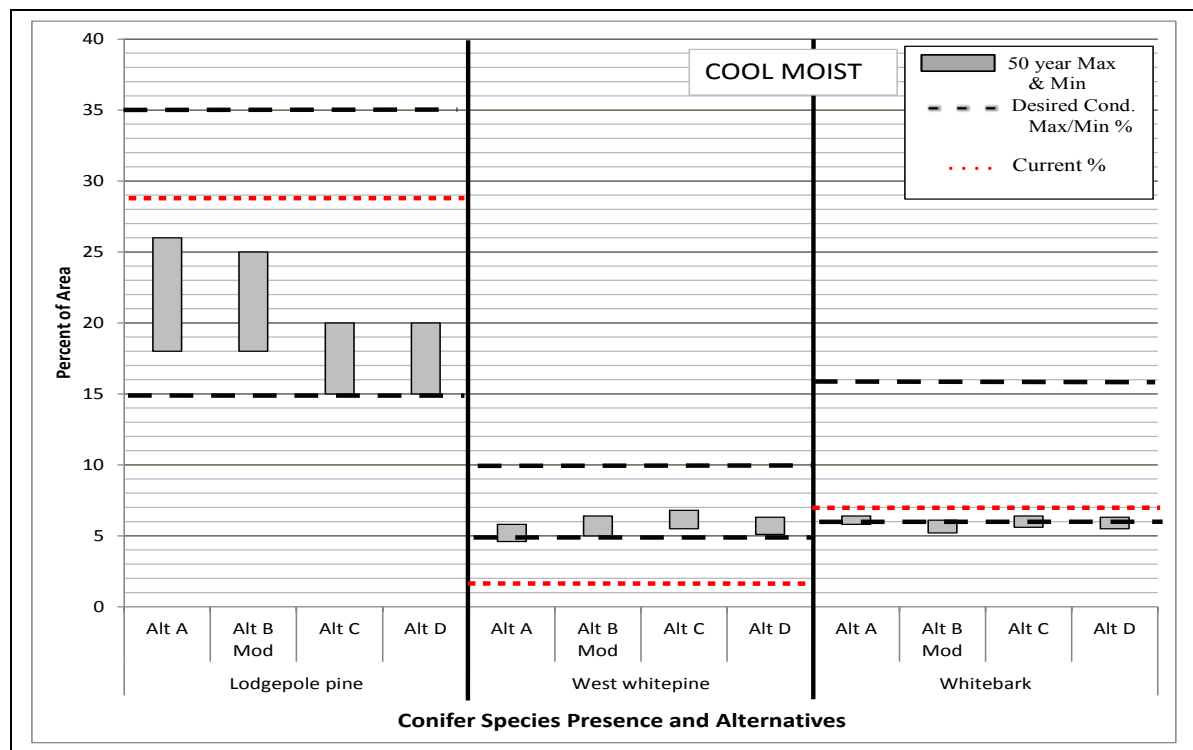


Figure 2-17. Modeled conifer species presence (minor species) in the cool-moist broad potential vegetation type group at decade 5.

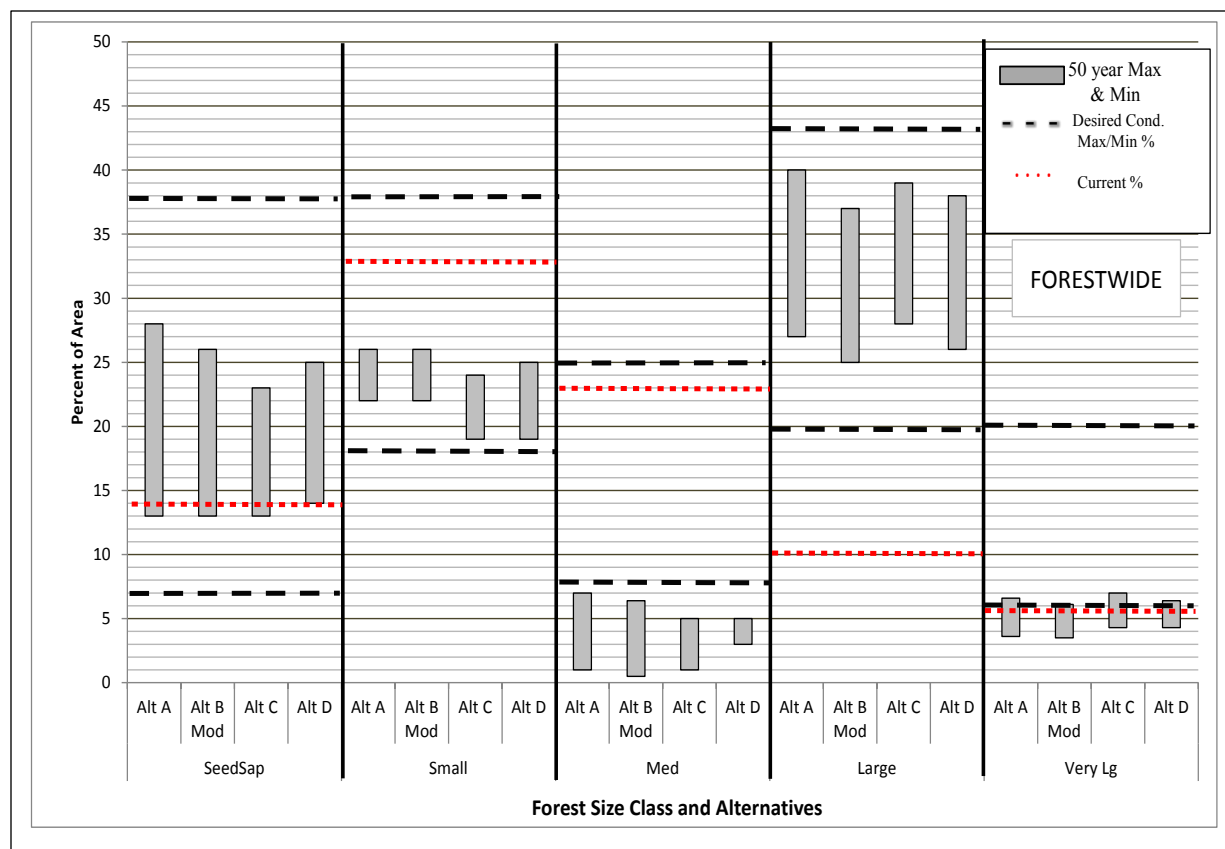


Figure 2-18. Modeled forest size class, forestwide, at decade 5.

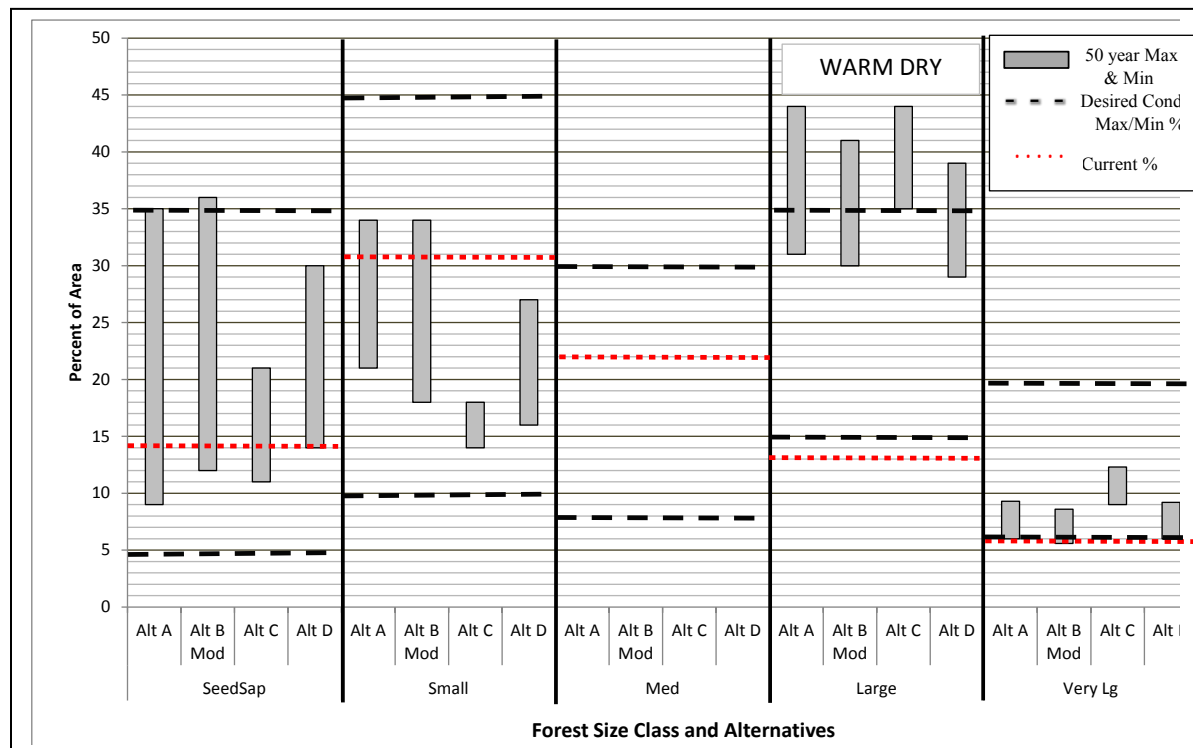


Figure 2-19. Modeled forest size class in the warm-dry broad potential vegetation type group at decade 5.

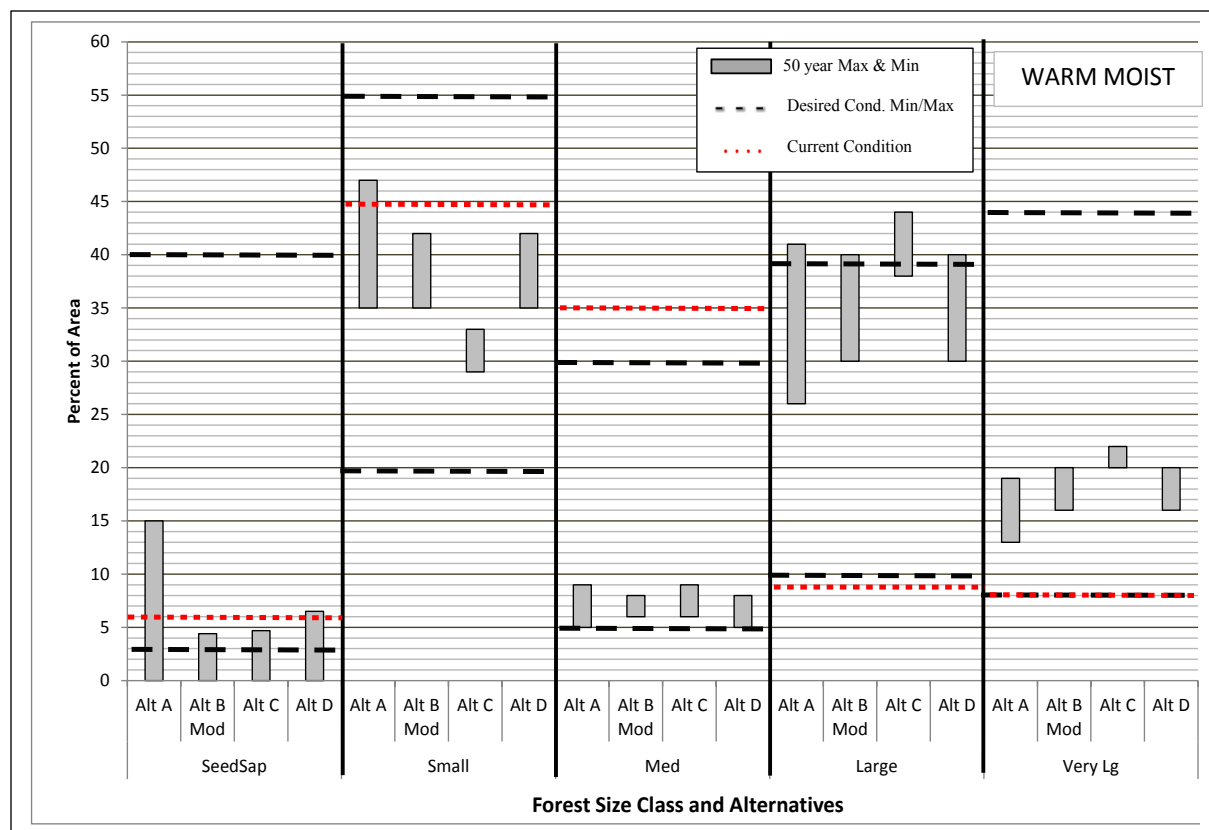


Figure 2-20. Modeled forest size class in the warm-moist broad potential vegetation type group at decade 5.

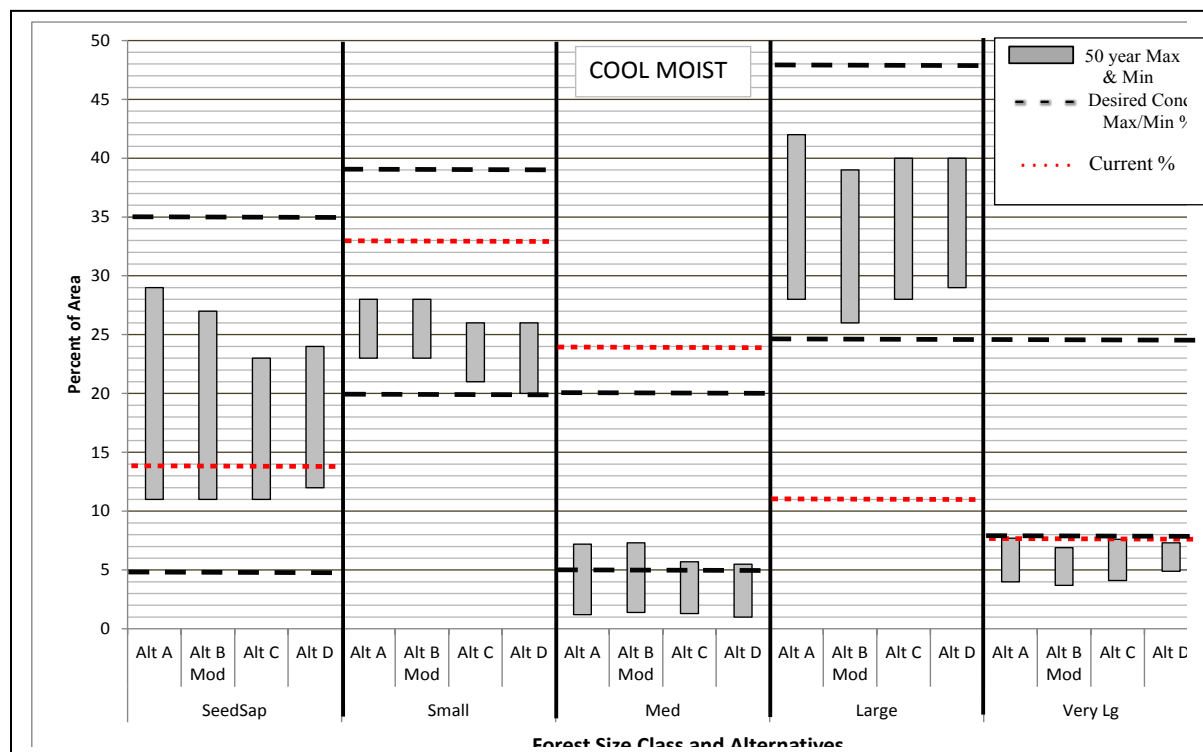


Figure 2-21. Modeled forest size class in the cool-moist broad potential vegetation type group at decade 5.

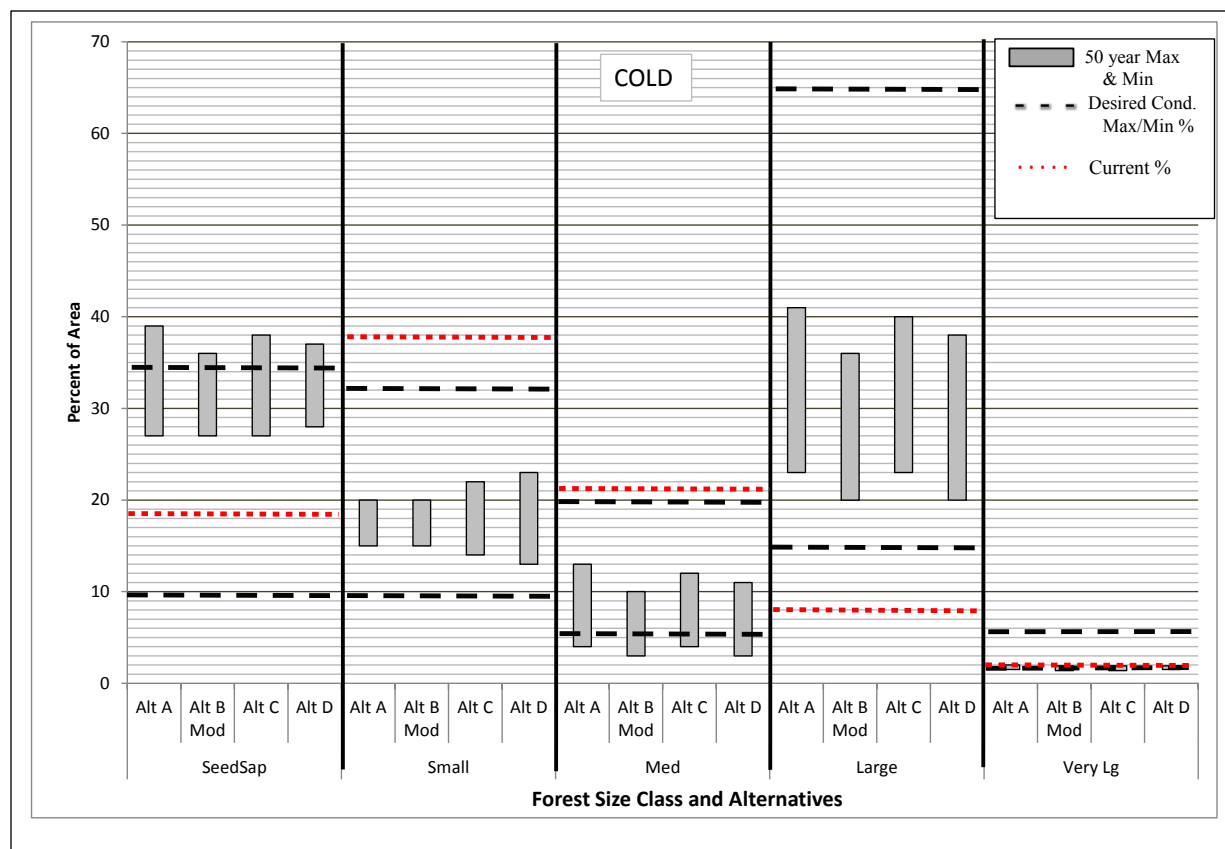


Figure 2-22. Modeled forest size class in the cold broad potential vegetation type group at decade 5.

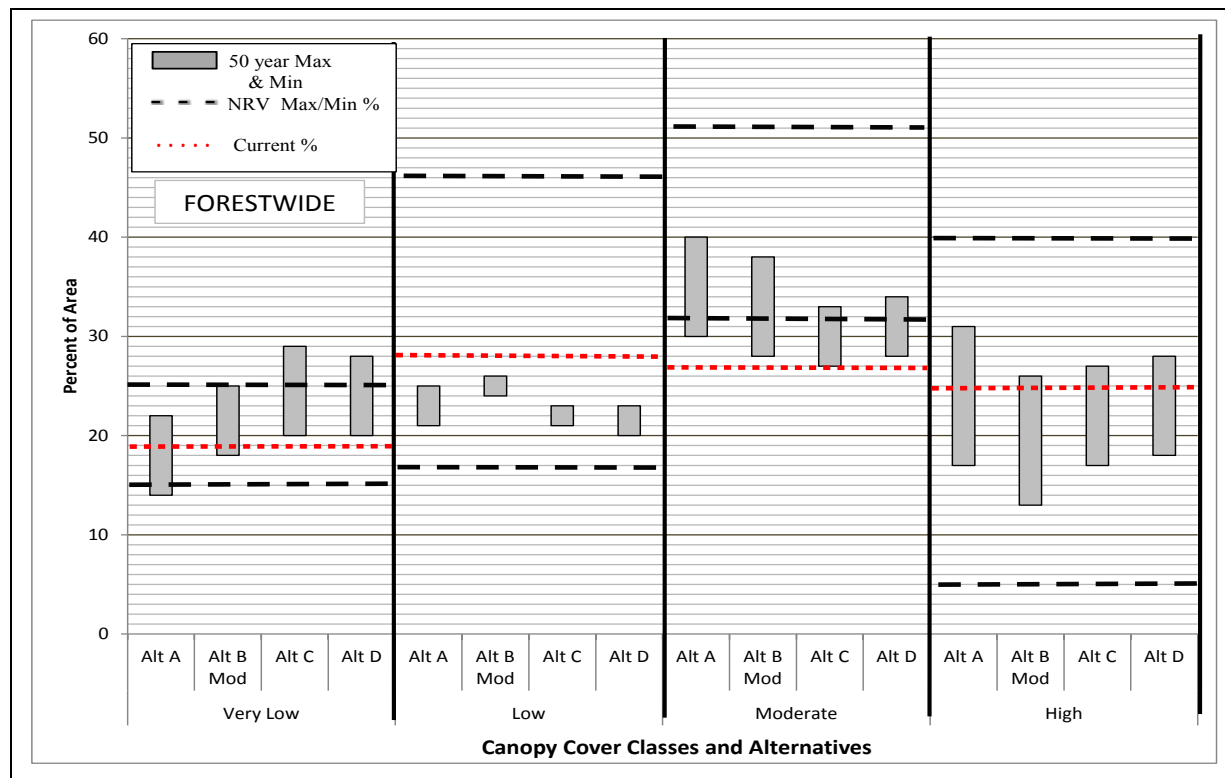


Figure 2-23. Modeled forest canopy cover class, forestwide, at decade 5.

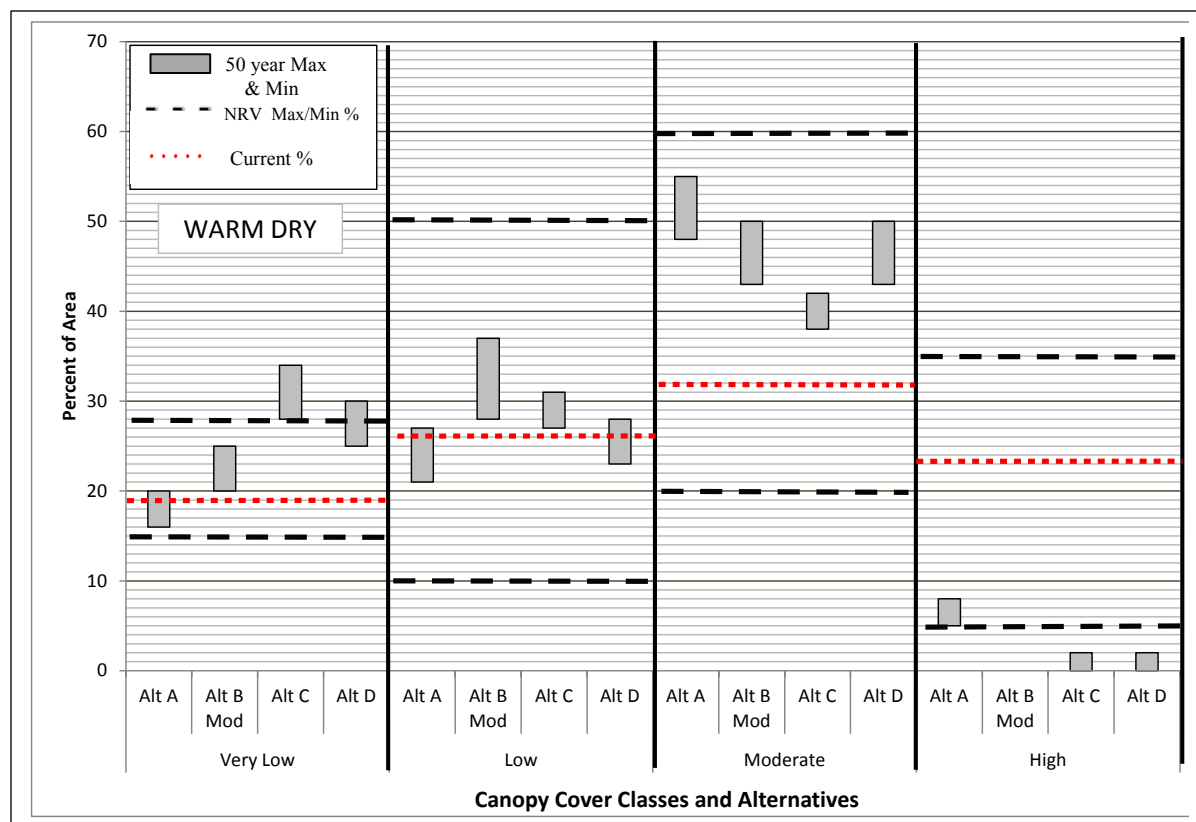


Figure 2-24. Modeled forest canopy cover class in the warm-dry broad potential vegetation type group at decade 5.

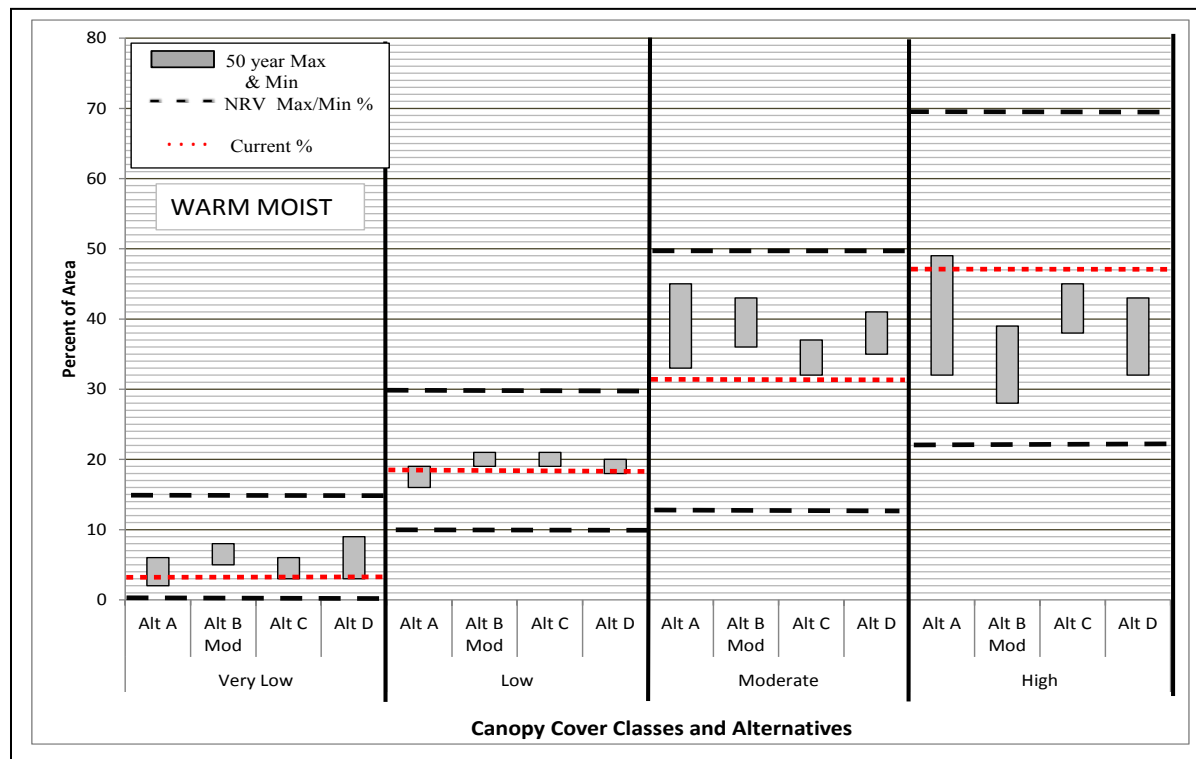


Figure 2-25. Modeled forest canopy cover class in the warm-moist broad potential vegetation type group at decade 5.

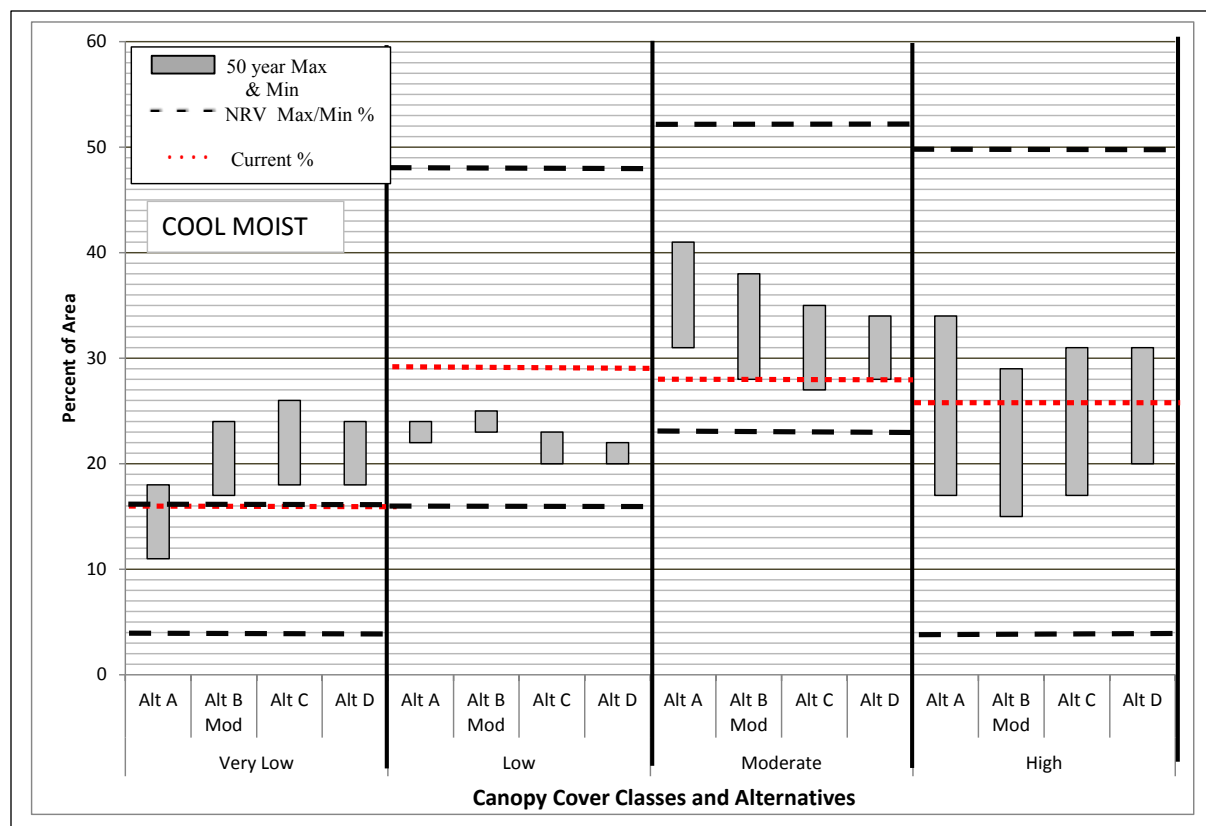


Figure 2-26. Modeled forest canopy cover class in the cool-moist broad potential vegetation type group at decade 5.

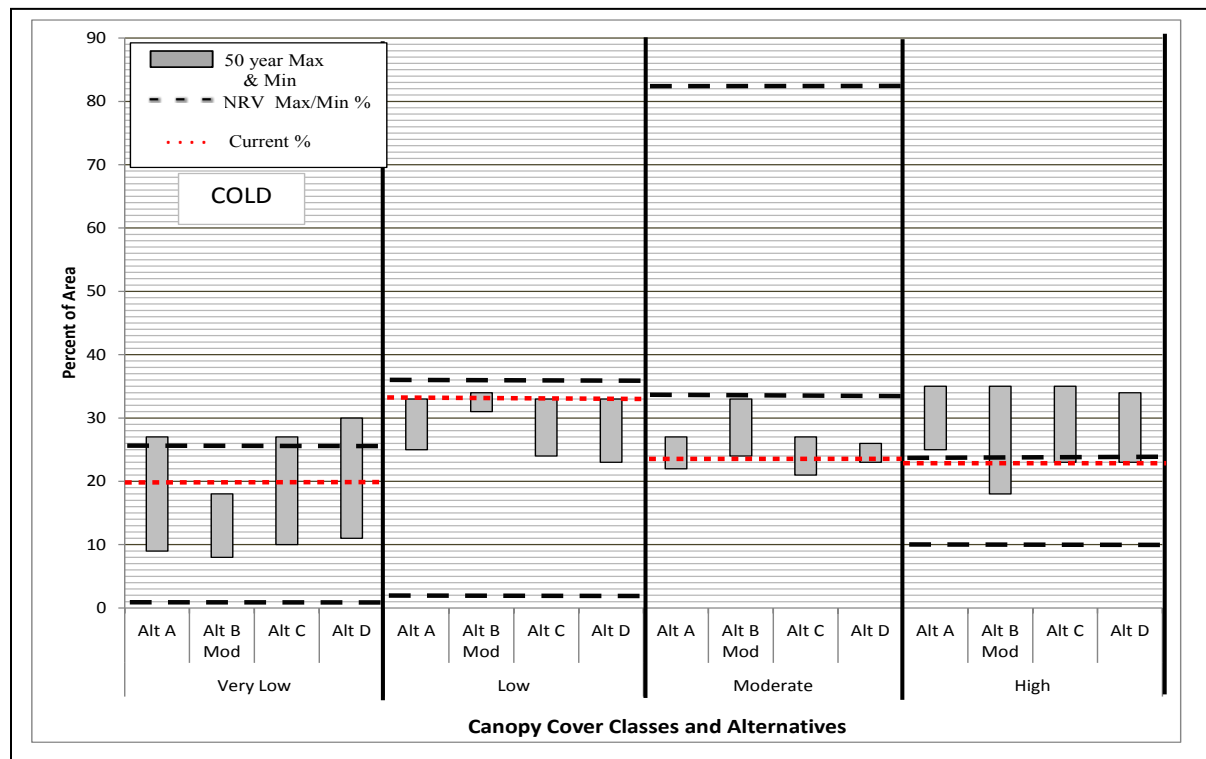


Figure 2-27. Modeled forest canopy cover in the cold broad potential vegetation type group at decade 5.

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Appendix 3. Modeled Wildlife Habitat Assessment

NOTE: Changes made to the SIMPPLLE Model between the draft EIS and the final EIS

The Flathead National Forest made modifications to the SIMPPLLE model between the publication of the draft EIS and the final EIS to correct some assumptions that were brought to light during the draft EIS analysis. Modifications include adjustments to the model logic and assumptions for Douglas-fir and spruce beetle activity and for the amount of fire activity in the future. In addition, further corroboration of the SIMPPLLE VMap vegetation database with the Forest Inventory and Analysis summary database was done to improve estimates and correlation of large/very large forest size classes and species presence between the two databases. These updates to SIMPPLLE resulted in differences in estimates for some vegetation characteristics into the future (over a 5-decade period) in the final EIS compared to the draft EIS. Detailed information on the model updates conducted between the draft EIS and final EIS and the resulting vegetation changes can be found in several planning record exhibits (Trechsel, 2017a, 2017b; USDA, 2017).

Because changes in projected vegetation conditions might influence wildlife habitat condition estimates, the wildlife biologist and vegetation specialist on the forest plan revision team reviewed the differences in model outputs in the context of the wildlife habitats, results, and conclusions documented by the Ecosystem Research Group in the following wildlife habitat assessment. The results of this review can be found in the addendum beginning on page 65 of this appendix.

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Chapter 1. Introduction

The Flathead National Forest is engaged in a land management plan (forest plan) revision effort. Ecosystem Research Group was contracted by the U.S. Forest Service (USFS) to conduct an independent analysis of the effects of the Flathead National Forest's forest plan alternatives on 11 select wildlife species and one species guild, including federally listed species; species of conservation concern; species of interest for trapping, hunting, subsistence, or observing; and species associated with riparian areas. In addition, Ecosystem Research Group modeled habitat connectivity over a 50-year period for marten, a species known to be associated with patches of forest cover in relatively close juxtaposition to each other.

Ecosystem Research Group conducted the assessment using the USFS SIMPPLLE (SIMulating Patterns and Processes at Landscape scaLEs) model. The SIMPPLLE model is a spatially explicit model which uses logic pathways to predict how forests respond over time to succession, wildfires, and insect and disease risks based on cover types, size classes, crown closure, aspect, and slope (Chew, Moeller, & Stalling, 2012). The SIMPPLLE model also allows the logic coefficients to be adjusted to reflect the potential that the future climate may become warmer and drier in the northern Rockies as a result of global climate change impacts. In order to ensure the relevance of the modeled variables to a particular forest or landscape, they must be adjusted to fit local growing sites, insect risks, and fire behaviors. Adjustments to the SIMPPLLE model's system knowledge for the Flathead National Forest were completed during the fall of 2015.

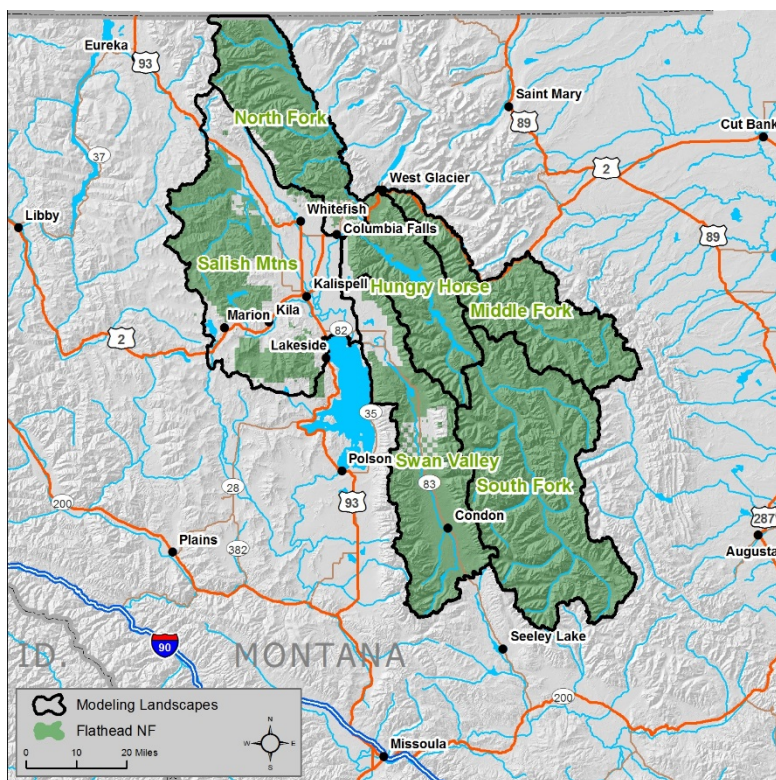


Figure 3-1. Flathead National Forest modeling area

The SIMPPLLE model was used to evaluate how habitats change over a 50-year period by forest plan alternative. Modeling was performed assuming a trend to continued warmer, drier summer conditions

using warmer and drier climate settings for years 30-50. The area modeled a total of 3.25 million acres, including all 2.27 million acres of the Forest (Figure 3-1).

The wildlife species selected are similar in that the literature suggests that key characteristics of vegetation habitat quality and availability that can be modeled are primary drivers and stressors. Furthermore, the species are comparable in that, with the exception of elk and white-tailed deer, all are “specialists” rather than “generalists,” which is notable because specialists require a narrow set of vegetative conditions for suitable habitat and are thus more likely to become at-risk from changes in habitat over time. Lastly, the 11 wildlife species occupy substantially different habitats across the Flathead National Forest including large diameter, open-grown ponderosa pine (habitat for flammulated owls), very large diameter larch, ponderosa pine, black cottonwood, and western redcedar (*Thuja plicata*) snags (habitat for pileated woodpeckers), and mid-upper elevation interior, mature forests (habitat for American martens). Modeled habitat can be compared against the natural range of variation to identify major departures from historic conditions that might place a species at risk. The disturbances (wildfire, insects, disease, and human vegetation management) or lack thereof that created such departures can be identified from modeled results. The timeframe and duration of situations where habitat is limited can also be derived from modeled results.

Because the SIMPPLLE model is a spatially explicit model, it allows for the evaluation of available habitat over time and the arrangement of that habitat in terms of patch size. For example, the analysis for American marten includes a species-specific habitat assessment and an examination of general changes in patch size and habitat connectivity over time within designated areas.

1.1 Area Description

The Flathead National Forest represents the portion of USFS Northern Region with moderate to high elevations, moderate to high precipitation, and relatively productive growing sites. Valley bottoms typically are forested with mixes of Douglas-fir, western larch, and grand fir. Less common are western redcedar, lowland hemlock, black cottonwood, paper birch, quaking aspen, and white pine on mesic sites or ponderosa pine on drier sites. Mid-elevations and riparian areas are forested with stands of Douglas-fir, western larch, lodgepole pine, subalpine fir and Engelmann spruce. High elevations contain stands of subalpine fir and Engelmann spruce with lodgepole pine, mountain hemlock, and whitebark pine at the highest elevations (USDA, 2011a, 2011b). Nearly all of the mature whitebark pine has succumbed to white pine blister rust in the last half century.

The Flathead National Forest is different from other national forests in western Montana (i.e., Lolo, Bitterroot, and Kootenai National Forests) in that valley bottoms and foothills generally lack the warm, dry habitat group that is characterized by open stands of ponderosa pine and frequent, low-severity wildfires. Habitat for open forest-associated species such as flammulated owls, therefore, occurs at substantially lower levels than on other forests in western Montana. Another difference on the Flathead National Forest is that low-elevation valleys and south- to west-facing slopes tend to have substantially higher snow depths than on comparable low-elevation slopes on adjacent forests. This makes wintering conditions for wild ungulates (e.g., elk, white-tailed deer, and mule deer) more challenging than on adjacent forests. The Flathead National Forest also has a higher percentage of Engelmann spruce-subalpine fir (about 80 percent of forest acres) than other western Montana forests and occurs at the eastern periphery of the range of western redcedar, western hemlock, and western white pine.

1.2 Questions Addressed

The habitat assessment addresses the following questions:

- How does habitat for the modeled species change during the 50-year period by alternative?
- What combination of disturbances or lack thereof is responsible for those changes?
- Are projected long-term vegetation changes consistent with the recovery of federally listed species as mandated by the Endangered Species Act (*Endangered Species Act of 1973; Pub. L. 93-205, Stat. 884, 16 U.S.C.*)?
- Are projected long-term vegetation changes consistent with providing the ecological conditions necessary to maintain or restore a viable population of a species of conservation concern in the planning area, within the authority of the Forest Service and the inherent capability of the plan area (36 CFR 219.9(b)(1))?
- How do the forest plan alternatives affect habitat availability over time, and are management activities that are included in the alternatives more or less important in influencing future wildlife habitats than are natural disturbances that are predicted to occur?
- For at-risk species, do the forest plan alternatives sustain or improve habitat over time?

Four forest plan alternatives are compared in this analysis. Table 3-1 outlines total acres of modeled mechanical treatments and prescribed burns over the 50-year model period, by alternative. Total human-generated disturbance, including various types of logging and prescribed burning, represents a modest percentage of the Forest's 2.69 million acres. Acres treated over the 50 years range from 4 to 18 percent of total forest acres.

Table 3-1. Modeled vegetation management treatments by alternative

Alternative	Clearcut with Reserves	Commercial Thinning	Ecosystem Management Broadcast Burn	Ecosystem Management Underburn	Group Selection Cut
A	73,087	--	--	--	25,985
B	76,233	161,214	200,777	45,093	--
C	28,272	120,334	196,153	49,130	42,011
D	72,840	72,716	162,639	43,970	14,810

Chapter 2. Methods

2.1 How The SIMPPLLE Model Works and Modeling Assumptions Used

SIMPPLLE was initially developed for the USFS Northern Region as a management tool to integrate disturbance processes and vegetation conditions at a range of spatial scales.

Specifically, SIMPPLLE's purpose is to provide the user with the ability to:

- Simulate ranges of conditions of plant communities and processes that can be expected for specific landscapes;
- Provide a basis for identifying the probability of disturbance processes and vegetation conditions;
- Simulate future vegetation changes caused by disturbance processes at multiple landscape scales;

- Simulate how changes in vegetation patterns influence the activity of fire, insect, and disease processes;
- Simulate management treatment alternatives for their impact on disturbance processes and the attainment of desired conditions at landscape scales, and;
- Identify areas of high priority for treatments that can help achieve and sustain desired conditions at landscape scales.

The SIMPPLLE model was used in the Flathead National Forest's forest plan revision for two purposes: to calculate natural range of variation and to project the landscape conditions of the alternatives for analysis in the environmental impact statement (EIS). This section discusses the use of SIMPPLLE to analyze natural range of variation and to compare alternatives. The introduction describes the nature and utility of SIMPPLLE. This is followed by a discussion of data sources, calibration, and results specific to the Forest.

The SIMPPLLE model is a stochastic vegetation simulation model used to model vegetation conditions for the national forests. It takes a landscape condition at the beginning of a simulation (including past disturbances and treatments) and uses logic to grow the landscape through time, while simulating natural processes (growth, wildfire, insect damage, etc.) that might occur on that landscape during the simulation, accounting for the effects of those processes. Process occurrence in a timestep is dependent on many factors, including the vegetation's conditions at that timestep, the occurrence of past processes at a site, and proximity to other areas experiencing the outbreak of a particular process. Simulation timesteps are typically 10 years, and simulations often are made for multiple timesteps. The logic assumptions in the model are set by the analyst and come from a variety of sources, including expert opinion, empirical data, and modeled data from other forestry computer applications such as the Forest Vegetation Simulator.

One of the main utilities of the model is its stochastic nature. The model is typically run for multiple iterations to allow the manager to see a variety of possible projections, look for patterns, and adjust management response accordingly. Managers cannot know with precision the specific types, locations, and extents of natural disturbances that will occur on the landscape. Therefore, the SIMPPLLE model will randomly assign wildfire, insect, and disease processes on the landscape in a manner consistent with what is known about the nature of these disturbances (e.g., insect-prone stands have a higher hazard and probability of getting an infestation, especially in a dry climate cycle). As with fire, estimates of insect and disease activity are modeled based on our best available information but are associated with a high level of uncertainty. Though it is reasonable to assume that there will be an increase in insect and disease activity over the next five decades, it is believed that the infested acres and length of the outbreak of Douglas-fir and spruce beetle in particular, are substantially overestimated in the model (see the Flathead National Forest's forest plan, final EIS, appendix 2).

The other main utility of the SIMPPLLE model is its spatially interactive nature. A process occurring on one site is dependent, to an extent, on the processes that are occurring on adjacent sites. Consider a fire event, for example. SIMPPLLE simulates fire by assigning fire *starts* with a probability consistent with what historic records indicate for the area and climate. Each start is then given the opportunity to grow. The size the fire grows to is dependent on the surrounding vegetation as well as the historic probability that it will end with a weather event (or, if simulating fire suppression, whether or not there are enough resources to put the fire out). The *type* of fire that spreads (lethal, semi-lethal, or non-lethal) is dependent on the vegetation conditions of the site (including past disturbance or treatment), the climate assumption for the timestep, its elevational position relative to the burning fire (uphill, downhill, etc.) and whether it is downwind or not. Again, the fire process will stop according to the probability of a weather-ending

event, successful fire suppression, or its running up against a natural barrier such as the treeline or a lake. SIMPPLLE will then determine the *effect* of the fire by considering whether there are trees present capable of reseeding/resprouting the site (in the case of a lethal fire), whether the stand's fuel conditions have been reduced (for semi- or non-lethal fires), and whether there has been a change in size and/or species on the site.

2.2 SPECTRUM Model and Associated Uncertainties

Vegetation treatments for each alternative were determined with Spectrum, a software modeling system designed to assist decision makers in exploring and evaluating multiple resource management choices and objectives. Models constructed with Spectrum apply management actions to landscapes through a time horizon and display resulting outcomes. Management actions are selected to achieve desired goals (objectives) while complying with all identified management objectives and limitations (constraints).

Both the SIMPPLLE and Spectrum models use a given set of assumptions, including the amount of stand-replacing fire and insect or disease activity and the rate of tree growth and stand structure change over time (succession). These assumptions are based on analysis and corroboration of actual data (such as fire history and historical vegetation information) and review of scientific literature, as well as professional judgement and experience of resource specialists familiar with the ecosystems and forest types of the Flathead National Forest. Though best available information and knowledge is used to build these models, there is a high degree of variability and uncertainty associated with the results because of the ecological complexity and uncertainty of future events.

2.3 Identifying Natural Range of Variation

The 2012 planning rule directives (Forest Service Handbook 1909.12, chap. 20) describe using the natural range of variation as a basis from which to understand ecosystem integrity and establish desired future conditions that enhance the resiliency of the landscape. In the zero code of these directives is the definition of natural range of variation, generally: “the variation of ecological characteristics and processes over scales of time and space that are appropriate for a given management application.” The definition goes on to suggest that “the pre-European influenced reference period considered should be sufficiently long, often several centuries . . .” and should “. . . include short-term variation and cycles in climate.”

For the Flathead plan revision, we chose to model vegetation conditions from AD 960 through 2000. This reference period allowed us to simulate the conditions associated with much of the time period known as the Medieval Climate Anomaly as well as the other end of the climate spectrum known as the Little Ice Age. The inclusion of the Medieval Climate Anomaly in the simulation is potentially valuable in that it might indicate conditions and processes that could occur in the modern climate regime (Calder, Parker, Stopka, Jimenez-Moreno, & Shuman, 2015).

Vegetation Conditions

The Northern Region VMap product for the Flathead National Forest was used to populate the landscape with dominance type, size, and density information needed by the SIMPPLLE model. VMap is a vegetation map derived mainly from remotely sensed (satellite) data calibrated with on-the-ground sample data. The dominance type was supplemented with secondary species data using a combination of “looks like” data provided with the VMap product and quantities of species presence indicated by Forest Inventory and Analysis data. The “looks like” data is a similarity percentage to other polygons that are typed with a particular dominance type. For instance, a Douglas-fir VMap polygon may have a “looks like” value for ponderosa pine of 20 percent. This might indicate there is ponderosa pine on the site, just

not in sufficient quantity for it to dominate the site. If Forest Inventory and Analysis indicates there is more ponderosa pine on the landscape than the VMap has as a dominance type, we searched for the most likely sites to add ponderosa pine as a secondary component by searching for the appropriate “looks like” threshold for each species. For instance, a “looks like” threshold for ponderosa pine of 15 percent would mean the site in question would be classified as a Douglas-fir and ponderosa pine mix. Ultimately the data from this process is used to populate the grid of 150 m squares used in the SIMPPLLE simulation.

That said, we realize that pinning down an exact starting condition is not of much value for natural range of variation (it is valuable for doing futuring and analyzing the plan alternatives, but that is another discussion). For one, it is a fallacy to assume that the conditions on the ground today are representative of vegetation conditions in the year 960. Secondly, the starting conditions for natural range of variation are arguably not critical to the simulation. Other natural range of variation studies, such as those conducted by LANDFIRE, use random starting conditions (USGS, 2013). Therefore, to begin each simulation in the year 960, the current vegetation conditions derived from VMap/Forest Inventory and Analysis are simulated with the climate data from the past 15 decades, mainly to “wash” out the influences of modern vegetation management and fire suppression. Ultimately, the vegetation conditions resulting from this initial 150-year projection were used to approximate the landscape at year 960.

Initial Logic Assumptions in SIMPPLLE

The initial SIMPPLLE model logic used for the Flathead forest plan came from a long history of expert opinion, trial and error, and research that has been maintained and documented in logic files that are passed from Forest to Forest. These assumptions are documented in the model itself, through the assumption documentation screens. Before the Flathead planning team effort, the Nez Perce-Clearwater National Forests revised their logic in 2012 for a natural range of variation run, and these assumptions were used as a basis for the Flathead analysis. However, there were several key points of logic updates made specific to the Flathead that are described next. Specifically, these were fire severity assumptions, fire size and start assumptions, and some pathway modifications that describe vegetation growth (for example, in avalanche chutes).

Historic Climate

In consultation with the Rocky Mountain Research Station in Missoula, Montana, we determined that the appropriate indicator of past climate was the Palmer Drought Severity Index (Anderson & Thompson, 2013). Data for the index is typically reconstructed for localized points, and the data point nearest the Flathead National Forest was used to evaluate the climate for the area. Data is presented as a yearly indicator and therefore had to be generalized to a decadal average for simulations in the SIMPPLLE model. The data was smoothed using a 30-year third order “spline” function, which means that a curve was fitted for each year using a localized set of 30 data points. A random starting year within the first decade was then chosen to represent that decade, and points every 10 years from then were used to represent the full set of decadal index values. Finally, the points were categorized into three climate scenarios—wetter, drier, and normal—based on their quartile. The driest quartile indicated the dry decades of the simulation, the middle two were considered “normal,” and the wettest represented the wet decades.

Natural Range of Variation Summaries by Species

Natural ranges of variation are modeled for each wildlife species. For instance, the natural range of variation for the flammulated owl represents the upper and lower range of flammulated owl habitat (i.e., open, large diameter ponderosa pine/Douglas-fir forest). Results of SIMPPLLE-modeled habitat for each of the 12 species is “bracketed” by the natural range of variation showing the degree to which current and future modeled levels of habitat compare with the natural range of variation. This provides an indication

of risk of long-term viability for each species. Habitat levels for a given species at or above the maximum natural range of variation suggest the species is not at risk. Conversely, habitat levels near or below the minimum natural range of variation suggest the species is at some potential risk of becoming nonviable over time.

2.4 Modeling to Compare Alternatives

Thirty replications of each scenario were run through SIMPPLLE to determine a range of possible outcomes. Results were compiled and analyzed across all 30 simulations to represent a realistic range of projected future conditions, keeping track of average levels as well as the maximum and minimum levels.

2.5 Wildlife Species and Habitat Query Designs

This analysis evaluates the level of currently available habitat and models potential future habitat in 10-year increments over 50 years for the following wildlife species: flammulated owl, fisher, American marten, Canada lynx (stand initiation foraging habitat), Canada lynx (multistoried foraging habitat), black-backed woodpecker, olive-sided flycatcher, pileated woodpecker, moose/elk summer foraging habitat, white-tailed deer winter habitat, forested habitat connectivity, species associated with riparian areas, and the northern goshawk.

As discussed previously, habitats for wildlife species are correlated to vegetation parameters as affected by growth, forest succession, and disturbances (i.e., fires, insects, disease, and human disturbances) over time. These parameters were captured in remotely sensed images and classified using R1-VMMap polygons that were then used to create SIMPPLLE modeling landscapes. The literature was searched to find the best available science correlating vegetation characteristics to the species' habitat requirements. This process was repeated, refinements were made, and concurrence was achieved with key USFS personnel.

The vegetative habitat components for each species were selected from the habitat group, cover type, size class, and density fields in the SIMPPLLE modeling files. SIMPPLLE simulations were used to determine changes to the habitats from wildfire, insects and diseases, or vegetation treatments on National Forest System lands. The following sections describe the literature that helped determine necessary vegetation habitat components for the selected species and the vegetation parameter query used to model available habitat.

2.5.1 Flammulated Owl

Flammulated owls are strongly associated with mature xeric ponderosa pine/Douglas-fir stands in montane forests with snags (Hays & Rodrick, 2003; Hayward & Verner, 1994; Samson, 2006b). Although they prefer ponderosa pine forests, flammulated owls will also use open Douglas-fir forests (Marti, 1997). Home ranges composed of at least 75 percent old ponderosa pine/Douglas-fir forest were occupied more continuously than home ranges consisting of less than 75 percent in this forest type (Linkhart, Reynolds, & Ryder, 1998; R. T. Reynolds & Linkhart, 1992).

Flammulated owls prefer open canopy (less than 40 percent cover) (Samson, 2006a) and avoid dense young stands of Douglas-fir (Wright, Hejl, & Hutto, 1997). Flammulated owls also avoid clearcuts and intensively cutover areas but will use thinned or selectively logged stands.

Flammulated owls are secondary cavity nesters that often use abandoned pileated woodpecker (*Dryocopus pileatus*) or northern flicker (*Colaptes auratus*) cavities as nest sites. These may be reused for several years (McCallum, 1994). These nest sites may have pockets of dense Douglas-fir near the nest that are used for roosting (Wright, 1996). Some researchers suggest that this owl may be "semi-colonial," based on observations of clusters of calling owls with large "silent" areas between them (McCallum,

1994); however, this may be a function of habitat patchiness (Howie & Ritcey, 1987). Observations of clusters of breeding owls indicates that they may not reproduce if patches of suitable habitat are small and isolated or if open patches for feeding and dense young patches for roosting are not in close proximity to large snags for nesting (Wright, 1996).

Query Design

Ponderosa pine communities, used by flammulated owls, are extremely uncommon on the Flathead National Forest and are at severe risk due to fire exclusion. This has caused open ponderosa pine stands to convert through succession to dense stands dominated by Douglas-fir. Early and mid-20th-century logging removed many of the largest ponderosa pines. Forest Service monitoring often reports flammulated owls within relatively dense stands (> 40 percent crown closure), yet the research (Hayward & Verner, 1994; Wright, 2000) suggests that flammulated owls require open understories to successfully forage for moths and grasshoppers. Since few existing mature ponderosa pine stands are open (15-39.9 percent crown closure) due to long-term fire exclusion, flammulated owls may be selecting dense stands simply because those are all that remain in most areas. The query for flammulated owls assumes that highly suitable nesting habitat is limited to forested stands with an average greater than 15-inches diameter at breast height (d.b.h.) and crown closures of less than 40 percent. Based upon Forest Inventory and Analysis data, forests with an average diameter greater than 15-inches d.b.h. contain sufficient snags to provide habitat for the species that excavate nesting cavities used by flammulated owls (pileated woodpeckers and flickers). SIMPPLLE logic pathways show that dense stands of potential habitat (stands > 40 percent canopy closure) will convert to highly suitable habitat (stands < 40 percent crown closure) if treated by underburning, are burned by low- to moderate-severity wildfire, are attacked by Douglas-fir beetles, or are harvested or commercially thinned to remove understory and midstory trees. At a home range scale, timing of treatments would be designed to create a mosaic consisting of mature forest and dense understory patches of small trees, shrubs, and openings.

The query design for flammulated owl suitable habitat includes the following layers:

- Cover types: all cover types within the following habitat groups that include either ponderosa pine or Douglas-fir including mixed stands that contain western larch, grand fir, western white pine, western redcedar, and lodgepole pine.
 - ♦ A2, warm and very dry
 - ♦ B1, warm and dry
 - ♦ B2, moderately warm and dry
- Tree size class: > 15-inch d.b.h., including:
 - ♦ 15-19.9-inch d.b.h.
 - ♦ 20+-inch d.b.h.
- Stands of 15-39.9 percent canopy cover

In addition, the following assumptions were made:

The SIMPPLLE model is dependent upon stand-level data (R1-VMap) and did not allow the incorporation of snag densities or understory composition. Thus, we integrated Forest Inventory and Analysis summary data to determine if snags for nesting exist at sufficient numbers within the larger size classes.

2.5.2 Fisher

Fishers (*Martes pennanti*) prefer dense, mesic, mature, and late-seral coniferous stands in low- to mid-elevation forests (Arthur, Krohn, & Gilbert, 1989; Jones & Garton, 1994). Fishers require specific structural elements, particularly very large trees and coarse woody debris (Ruggiero, Aubry, Buskirk, Lyon, & Zielinski, 1994). Diverse structural components, including fallen logs and stumps as well as some seedlings, shrubs, and herbaceous cover, are important habitat characteristics (Meyer, 2011). Earlier research suggests fishers are disproportionately tied to large, low- to mid-elevation forested stream bottoms and high canopy cover (Jones & Garton, 1994). In Montana, fisher habitat modeled by Olson et al. (2014) follows this pattern. In northern Idaho, however, habitat modeled by Olson et al. (2014) shows a pattern of large tracts of land independent of drainage patterns. In Montana, this spatial pattern may be associated with prevalence of stand-replacing wildfires outside of stream bottoms and/or more precipitation falling as snow as elevations increase. Raine (1983) found that movements of fisher were restricted by the soft, thick snow cover that was present during midwinter whereas marten did not appear to be hindered by soft snow cover to the degree that fisher were.

Fishers prefer late-seral forests over other habitats (Ruggiero et al., 1994). Yet, studies have shown that in the Rocky Mountains, there are times of the year where young to medium-age stands of conifers are preferred (Jones, 1991; Roy, 1991). Fishers do not have as strong a habitat relationship to interior forests as do American martens. Yet fishers avoid large open areas with low canopy closure, an aversion that may limit population expansion (Jones & Garton, 1994). At a landscape scale, Sauder and Rachlow (2014) found that the percentage of mature forest was not the best supported variable for predicting fisher occupancy, nor was the percentage of high canopy cover. Sauder and Rachlow (2014) found that fisher selected:

- Low- to mid-elevation mesic, mixed conifer forests in more contiguous and complex shapes,
- Landscapes where mature forest (defined as greater than 65 feet tall) comprised greater than 50 percent of the landscape,
- Landscapes where openings (defined as areas with less than 10 percent canopy cover) comprised less than 5.4 percent of the landscape.

Accordingly, it has been concluded that fishers are at risk from large stand-replacing wildfires, insect outbreaks, and habitat modification that removes the structural components they need for denning and resting (USFWS, 2009). There has been an increase in large stand-replacing wildfires on portions of the Flathead National Forest and adjacent Glacier National Park since the late 1980s.

Query Design

Olson et al. (2014) developed a coarse-scale land cover-based approach to determine the amounts and distribution of probable fisher habitat based on current vegetation and certain biophysical conditions. Sauder and Rachlow (2014) used a multi-scale product model to characterize both the configuration and composition of forest selected by fisher based on the monitoring of habitat use by individual animals. The Olson study determined the spatial probability of fisher habitat distribution was most influenced by several environmental variables such as tree canopy height, montane riparian vegetation, topographic position of habitat, and annual precipitation.

The query design for fisher habitat is based on the Olson model (Olson et al., 2014) and uses a combination of R1-VMap, Montana Natural Heritage Program, and Forest Inventory and Analysis data. Denning and resting habitat was modeled as forests with an average d.b.h. class greater than 10 inches, since trees in this class on the mesic habitats of the Flathead National Forest generally have an average height greater than 65 feet tall. High-elevation habitat types were excluded because annual precipitation

falling as snow is too high for use by fisher. Forest with a canopy cover class less than 15 percent was excluded from fisher habitat based upon the definition of an opening by Sauder and Rachlow (2014). The following mapped fields are included in the mapped layer:

- Cover type: any dominance types in the habitat groups below with presence of western larch, Douglas-fir, western hemlock, western redcedar, cottonwood which may provide cavities used for resting and denning.
- Habitat groups:
 - ♦ B3, moderately warm and moderately moist
 - ♦ C1, moderately warm and moist (grand fir)
 - ♦ C2, moderately warm and moist (western redcedar)
 - ♦ D1, moderately warm and moist (western redcedar)
 - ♦ D3A, lower elevation cool moist to moderately dry with white pine, (subalpine fir, spruce)
 - ♦ E1, moderately warm and moist to wet (western redcedar)
 - ♦ E2, cool moist to moderately dry (subalpine fir)
 - ♦ F1, cool moist to moderately dry (subalpine fir)
- Tree size class: > 10-inch d.b.h. for denning, resting in a mature landscape, including:
 - ♦ 10-14.9-inch d.b.h.
 - ♦ 15-19.9-inch d.b.h. (denning/resting)
 - ♦ ≥ 20-inch d.b.h. (denning/resting)
- Canopy cover > 15 percent, including:
 - ♦ 15-39.9 percent
 - ♦ 40-69.9 percent
 - ♦ 70-100 percent

In addition, the following assumptions were made:

Fine-scale habitat selection includes determining the presence of snags and coarse woody debris. VMap data does not provide information on these variables. Our query design uses Forest Inventory and Analysis data to identify stands where the presence of snags and coarse woody debris is likely.

2.5.3 American Marten

American marten (*Martes americana*) prefer moist, mid- to late-seral coniferous forests with moderate- to high-canopy closure at mid to high elevations (Ruggiero et al., 1994). Martens are often labeled as an “interior forest species” since they prefer large patches of late-seral forest (Ruggiero et al., 1994). Marten prefer high densities of snags and coarse woody debris (Buskirk, Forrest, Raphael, & Harlow, 1989) as complex physical structure near the ground provides refuge sites, access to prey, and a protective thermal environment (Buskirk & Ruggiero, 1994). Martens are “subnivean” foragers (Ruggiero et al., 1994) and are thus well suited to deep snow conditions.

Query Design

On the Flathead National Forest, all moist habitat groups from warm to cool (e.g., grand fir, western redcedar, and subalpine-fir/spruce) were included as potential marten habitat, consistent with locations of published research as well as numerous marten observations (MNHP, 2013; Tomson, 1999; Wasserman, Cushman, Schwartz, & Wallin, 2010).

The query design for marten includes the following layers:

- Cover types: Douglas-fir through subalpine fir
- Habitat groups:
 - ◆ B3, warm and moderately moist
 - ◆ C1, moderately warm and moderately moist
 - ◆ C2, moderately warm and moist
 - ◆ D1, moderately cool and moist
 - ◆ D3A, lower elevation cool moist to moderately dry with white pine, (subalpine fir, and spruce)
 - ◆ D3B, higher elevation cool moist to moderately dry with whitebark pine (subalpine fir, mountain hemlock)
 - ◆ E1, moderately cool and wet
 - ◆ E2, cool and wet
 - ◆ F1, cool moist to moderately dry (subalpine fir)
 - ◆ F2, moderately cool and moderately dry
- Tree size class: > 10-inch d.b.h., including:
 - ◆ 10-14.9-inch d.b.h.
 - ◆ 15-19.9-inch d.b.h.
 - ◆ > 20-inch d.b.h.
- Stands > 40–100 percent canopy cover, including:
 - ◆ 40-69.9 percent
 - ◆ 70-100 percent

In addition, the following assumptions were made:

The SIMPPLLE model is dependent upon stand-level data (R1-VMap) and did not allow the incorporation of snag densities or coarse woody debris. Forest Inventory and Analysis summary data are used to determine if snags and coarse woody debris exist in sufficient amounts within the larger tree size classes.

2.5.4 Canada Lynx

The Canada lynx (*Lynx Canadensis*) is listed as a threatened species under the ESA. Squires et al. (2013) described the distribution of lynx in Montana based on 81,523 telemetry points for resident lynx from 1998-2007. In Montana, lynx are primarily found in the northwestern portion of the state from the western border, through the Purcell Mountains and east to Glacier National Park, then south through the Swan and

Mission Mountains and the Bob Marshall Wilderness Complex to Highway 200. In northwest Montana, reproducing populations are documented in the North Fork, Middle Fork, South Fork, and Swan drainages of the Flathead National Forest, in the Purcell Mountains on the Kootenai National Forest, and in the Swan and Mission Mountain areas on the Lolo National Forest. The Flathead National Forest provides core habitat for the Canada lynx.

Potential lynx habitat is generally described as moist, boreal coniferous vegetation with cold, snowy winters that provide a prey base of snowshoe hares (*Lepus americanus*). Additionally, sites that typically have deep snow depths provide lynx, with their big feet, a competitive advantage (Koehler & Aubry, 1994) over other mid-sized predators (e.g., coyotes, bobcats). Primary vegetation in the northern Rockies that provides for snowshoe hares, and thus lynx, includes subalpine fir and Engelmann spruce forest types as well as mesic lodgepole pine and aspen (*Populus tremuloides*) forests at mid to high elevations (Koehler & Aubry, 1994).

Squires et al. (Squires, Ruggiero, Kolbe, & DeCesare, 2006) found that the highest lynx densities are in extensive mesic, spruce/subalpine fir forests. Although Engelmann spruce and subalpine fir were the dominant tree species in forests used by lynx, these forests also contained a mix of conifer species including Douglas-fir, western larch, and lodgepole pine. Lynx avoided dry conifer forests containing a high proportion of Douglas-fir trees, ponderosa pine trees, and grass in the understory (Squires, Decesare, Kolbe, & Ruggiero, 2010). Extensive dry, cold lodgepole pine forests have few if any lynx, which likely explains why cold, dry lodgepole-dominated forests east of the Continental Divide have no reproducing subpopulations (Squires et al., 2006).

Mature forests also provide concentrations of coarse woody debris for denning habitat although concentrations of woody debris in other situations (e.g., roadside slash) occasionally provide denning habitat (Butts, 1992; Koehler & Aubry, 1994). Squires, in his study of lynx in northwest Montana (2008; 2010), found that lynx located their dens in multistoried stands, in generally concave or drainage-like topographies. Lynx generally denned in mature spruce-fir forests with high horizontal cover and abundant coarse woody debris. Eighty percent of dens were in mature forest stands and 13 percent in mid-seral, regenerating stands. Young stands that were either naturally sparse or mechanically thinned were seldom used for denning. Squires found that denning habitat is generally abundant across the coniferous forest landscape. Foraging habitat (stand initiation and multistoried) is considered limiting, whereas denning habitat is likely not limiting.

Stand initiation hare habitat is made up of young, dense stands of saplings (and shrubs) that have regenerated after a disturbance such as a timber harvest or stand-replacing wildfire. These stands provide adequate cover and browse for reproduction and survival of snowshoe hares. On average, forest stands begin to provide winter habitat for snowshoe hares 15-20 years after disturbance (Koehler & Aubry, 1994), once trees and shrubs are tall enough to extend above the snow (Koehler & Brittell, 1990), and will often continue to provide habitat for another 20-25 years unless they are thinned. Denser stands appear to offer better habitat conditions for snowshoe hares; stands with less than 1,000 stems per acre are insufficiently dense to provide high-quality habitat for hares (Griffin & Mills, 2007).

Multistoried hare habitat includes older forest stands that provide dense coniferous understories that maximize cover and browse for hares at varying snow depths throughout the winter. Only multistoried stands in which tree limbs typically touch the snowline and in which the understory is dense provide winter habitat for snowshoe hares. Horizontal cover found in multistory forest stands is a major factor affecting winter hare densities.

Squires studied lynx resource selection in summer vs. winter, including lynx success in capturing snowshoe hares (Squires et al., 2010). Lynx selected a mosaic of forest stages to meet their seasonal

resource needs, with winter being the most constraining season for lynx in terms of resource use. During winter, lynx foraged primarily within a narrow elevation band composed of mature, large diameter trees (which Squires defined as greater than about 11 inches d.b.h.) with higher horizontal cover, more abundant hares, and deeper snow than available in areas outside this elevation band. These preferred forests included spruce-fir in the overstory and midstory forming a multistoried structure with high horizontal cover from conifer boughs touching the snow surface. During winter, the primary component of horizontal cover was subalpine fir followed by sapling and other tree densities. Sapling and other tree densities in forests used by lynx during winter were about 1,000 stems/acre for saplings and about 280 stems per acre for other trees. During winter, the proportion of tree size classes in forests used by lynx averaged 0.05 saplings (< 3 inches d.b.h.), 0.19 pole (about 3-7 inches d.b.h.), 0.42 mature (about 7-11 inches d.b.h.), and 0.29 large (> 11 inches d.b.h.) (Squires et al., 2010). Stands with dense understories or seedling-saplings providing multistoried lynx habitat typically have moderate canopy closure or open patches in the canopy that allow dense seedling-saplings to redevelop. Where overstory canopies are too dense to allow understory development, thinning of the overstory by insect/disease or vegetation management may allow those understories to develop. Conversely, once multistoried habitat is established, further thinning likely reduces the value of those stands for snowshoe hares and the suitability for lynx.

Squires found that lynx avoided openings in winter, and when they did use openings it was often within about 400 feet of cover (Squires et al., 2010). although cover is important to lynx while searching for food (Brand, Keith, & Fischer, 1976), lynx often hunt along edges (Mowat, Poole, & O'Donoghue, 2000). The Northern Region Lynx Management Direction (USDA, 2007) provides specific direction for vegetation management on National Forest System lands within lynx habitat. The standards most applicable to long-term changes in vegetation conditions include: (1) limiting regeneration by timber management projects on National Forest System lands within lynx analysis units so that "unsuitable habitat" (stands too young to provide winter stand initiation hare habitat) does not exceed 15 percent of the lynx habitat in a lynx analysis unit per decade, (2) limiting regeneration by vegetation management projects so that habitat in the stand initiation structural stage that does not yet provide winter snowshoe hare habitat cumulatively does not exceed 30 percent of the lynx habitat in a lynx analysis unit in total, (3) limiting timber harvesting that would reduce multistoried hare habitat except under specified conditions (e.g., up to a specified number of acres in the wildland urban interface), (4) limiting pre-commercial thinning that would reduce stand initiation hare habitat except under specified conditions, and (5) providing for linkage areas.

Query Design

We used mapped lynx habitat for the Flathead National Forest, which is based on lynx telemetry locations and elevations with presence of deep fluffy snow, having boreal forest habitat types (Pfister, Kovalchik, Amo, & Presby, 1977) that are capable of producing snowshoe hare and lynx habitat. We conducted two analyses for lynx to assess their distinct habitat requirements: (1) a stand initiation habitat analysis and (2) a potential multistoried habitat analysis. Additionally, all cover types with presence of subalpine fir/Engelmann spruce (which may be mixed with other species) were identified as potential habitat, to disclose how much of that potential habitat currently has subalpine fir or spruce and is in either a stand initiation or multistoried condition. If potential habitat is currently forested with western larch (typical seral species on warmer subalpine fir habitat types) or is in a single-storied, dense stem exclusion condition, that habitat is considered "potential" but may not provide snowshoe hare habitat in its current condition. Modeled multistoried habitat is limited to cover types that contain subalpine fir or Engelmann spruce (which may be mixed with other species) within subalpine fir/spruce habitat groups. Stand initiation hare habitat may be any cover types within grand fir, subalpine fir/spruce (often mixed with other species) because grand fir on the Flathead National Forest (although not abundant) occurs in close

juxtaposition to subalpine fir/spruce lynx habitat and is known to produce snowshoe hares. Once trees in the 0-5-inch d.b.h. class reach a VMap canopy cover class of 40 percent, they are generally dense enough to provide summer and later winter hare habitat.

Stand Initiation Hare Habitat

The query design for lynx stand initiation hare habitat includes the following:

- Lynx habitat layer for the Flathead National Forest
- Habitat group/cover type: subalpine fir series (excluding the E1 habitat group), including the following habitat groups:
 - ◆ C2, moderately warm and moist (grand fir)
 - ◆ D1, moderately cool and moist
 - ◆ D3A, lower elevation cool moist to moderately dry with white pine (subalpine fir, spruce)
 - ◆ D3B, higher elevation cool moist to moderately dry with whitebark pine (subalpine fir, mountain hemlock)
 - ◆ E2, cool moist to moderately dry
 - ◆ F1, cool and moderately dry
 - ◆ F2, moderately cool and moderately dry
 - ◆ G1, cold and moist
 - ◆ Since lynx primarily use spruce-fir forests (Squires et al., 2010; Squires et al., 2006), any cover type containing subalpine fir or Engelmann spruce was retained from within the habitat groups.
 - ◆ Lynx do not use dry habitats at low elevations or on southerly facing slopes such as ponderosa pine, dry Douglas-fir, or dry Douglas-fir/western larch cover types.
 - ◆ Lynx do not use highly mesic habitats at low elevations such as western redcedar; thus, habitat group E1 was removed.
- Tree size class: 0-5-inch d.b.h. seedling/sapling
- Canopy cover 40-100 percent; VMap canopy cover classes greater than or equal to 40 percent accounted for eighty-five percent (5,515 of 6,505) of Squires's lynx telemetry locations on the Flathead National Forest.
- At least 20 or more years since the previous stand replacing disturbance (high severity fire or regeneration logging) to model forest in the 0-5 inch d.b.h. class that are above winter snow depths and thus available to snowshoe hares. Forest in the 0-5 inch d.b.h. class and less than 20 years since the stand replacing disturbance are also summarized to model levels of lynx habitat in an unsuitable condition as identified in the Northern Rockies Lynx Management Direction (USDA, 2007).

Multistoried Hare Habitat

The query design for lynx multistoried hare habitat includes the following:

- Lynx habitat layer for the Flathead National Forest
- Habitat group/cover type: subalpine fir series (excluding the E1 habitat group), including the following habitat groups:
 - ◆ C2, moderately warm and moist

- ◆ D1, moderately cool and moist
- ◆ D3A, lower elevation cool moist to moderately dry with white pine, (subalpine fir, spruce
- ◆ D3B, higher elevation cool moist to moderately dry with whitebark pine, (subalpine fir, mountain hemlock)
- ◆ E2, cool moist to moderately dry
- ◆ F1, cool and moderately dry
- ◆ F2, moderately cool and moderately dry
- ◆ G1, cold and moist
- ◆ Since lynx primarily use spruce-fir forests (Squires et al., 2010; Squires et al., 2006), any cover type containing subalpine fir or Engelmann spruce was retained from within the habitat groups and modeled as suitable habitat.
- ◆ Lynx do not use dry habitats at low elevations or on southerly facing slopes such as Ponderosa pine, dry Douglas-fir or dry Douglas-fir/western larch cover types.
- ◆ Lynx do not use highly mesic habitats such as western redcedar; thus, habitat group E1 was removed.
- Tree size class: > 10-inch d.b.h., including:
 - ◆ 10-14.9-inch d.b.h.
 - ◆ 15-19.9-inch d.b.h.
 - ◆ ≥ 20-inch d.b.h.
 - ◆ Multistoried lynx habitat is provided by forests with a high proportion of trees in the 7-11-inch and 11+-inch diameter class, so all diameter classes with an average above 10 inches were included
- Stands > 40 percent canopy cover, including:
 - ◆ 40-69.9 percent
 - ◆ 70-100 percent
 - ◆ VMap canopy cover classes greater than or equal to 40 percent accounted for 85 percent (5,515 of 6,505) of lynx telemetry locations on the Flathead National Forest.

In addition, the following assumptions were made:

Although snowshoe hares require a dense understory, the SIMPPLLE model is dependent on R1-VMap classes and did not allow the incorporation of understory density. The Northern Region Lynx Management Direction is highly prescriptive and is incorporated into all Flathead National Forest forest plan alternatives. Thus, this SIMPPLLE analysis identifies subtle differences in the amount and arrangement of possible stand initiation hare and multistoried hare habitat over the 50-year time period.

2.5.5 Black-backed Woodpecker

Black-backed woodpeckers (*Picoides arcticus*) are associated with boreal and montane coniferous forests that have experienced recent burns. Black-backed woodpeckers are known to use three types of forested habitat: (1) post-fire areas that have burned within one to six years, (2) areas with extensive bark beetle outbreaks causing widespread tree mortality, and (3) areas of smaller disturbances scattered throughout

the forest caused by wind throw, ice damage, or other occurrences that produce small patches of dead trees. These conditions all provide habitat for the black-backed woodpecker's primary food source, woodborer beetles and larvae. In an Oregon forest with a bark beetle epidemic, overall nesting success averaged 68.5 percent (Goggans, Dixon, & Seminara, 1987). In contrast, nest success was 100 percent for nests monitored in burned forests of western Idaho (Saab & Dudley, 1998).

Within those habitats, black-backed woodpeckers select a diverse mixture of conifer species, none of which is by itself essential to the species. These include ponderosa pine, spruce, western larch, mountain hemlock (*Tsuga mertensiana*), Douglas-fir, and lodgepole pine (Dixon & Saab, 2000).

Black-backed woodpeckers nest in snags at high densities in burned areas and can colonize very small, isolated burns (Hitchcox, 1996). Black-backed woodpeckers in the northern Rockies have a high degree of relatedness and can colonize burns across a wide geographic range (Pierson, 2009). Hoyt and Hannon (2002) concluded that black-backed woodpeckers can colonize new burns from up to 50 kilometers away.

High-severity stand-replacing wildfires may be particularly important for this species (Hutto, 1995), though the woodpeckers may also select lower-intensity fires such as controlled burns (Russell et al., 2009). Black-backed woodpecker abundance was not correlated to burn size but was best correlated to the number of small snags remaining after fire in the northern Rockies (Hutto, 1995). Forristal (2009) found that black-backed woodpeckers showed changing preferences for nest snag characteristics over time and recommended that the full range of snag species and diameters should be a component of maintaining black-backed woodpecker nest habitat. At the plot scale, snag density was the most important predictor of nest-site occurrence, with increasing snag numbers > 9 inches d.b.h. associated with black-backed woodpecker nesting. In the Blue Mountains located in northeastern Oregon, the mean d.b.h. of nest trees was 37 cm (14.6 in) (n = 15), and trees were generally recently dead (< 5 year) (Bull, Peterson, & Thomas, 1986). Hejl et al. (2000) concluded that salvage logging eliminated black-backed woodpecker habitat, even when some unburned trees were left.

Query Design

The query design for black-backed woodpecker includes the following layers:

- Habitat group/cover type: all habitat groups (excluding high elevation alpine cover types WB, WB-ES-AF, and AL-WB-AF), including:
 - ◆ A2, warm and very dry
 - ◆ B1, warm and dry
 - ◆ B2, moderately warm and dry
 - ◆ B3, warm and moderately moist
 - ◆ C1, moderately warm and moderately moist
 - ◆ C2, moderately warm and moist
 - ◆ D1, moderately cool and moist
 - ◆ D3A, lower elevation cool moist to moderately dry with white pine, subalpine fir, spruce
 - ◆ D3B, higher elevation cool moist to moderately dry with whitebark pine (subalpine fir, mountain hemlock)
 - ◆ E1, moderately cool and wet
 - ◆ E2, cool and wet

- ◆ F1, cool and moderately dry
- ◆ F2, moderately cool and moderately dry
- ◆ G1, cold and moist
- Tree size class > 10-inch d.b.h., including:
 - ◆ 10-14.9-inch d.b.h.
 - ◆ 15-19.9-inch d.b.h.
 - ◆ ≥ 20-inch d.b.h.
- Canopy cover > 15 percent, including:
 - ◆ 15-39.9 percent
 - ◆ 40-69.9 percent
 - ◆ 70-100 percent
 - ◆ Canopy cover is of minor importance in predicting black-backed woodpecker habitat (Saracco, Siegel, & Wilkerson, 2011), but we excluded the lowest canopy cover class to rule out forests with regeneration harvest prior to burning or salvage after burning.

For timestep zero, a GIS layer including the locations of all severities of wildfire (low, moderate, and high severity) in the past 10 years was used to select existing habitat. Most of the acreage burned on the Flathead National Forest during this time period has been high severity. This 10-year time period incorporated Caton's (1996) six-year occurrence following fires and Hutto's (personal communication) finding that trees stressed by wildfire may continue to die over a 10-year period, prolonging the use of burned forests. For modeled future timesteps, black-backed woodpecker habitat includes those stands meeting the habitat group and tree size class that are modeled to burn during those timesteps. Since black-backed woodpecker nesting success was found to be lower in mountain pine beetle-killed habitats compared to post-fire habitats, mountain pine beetle-killed habitats are not considered high-quality nesting habitat on the Forest, although black-backed woodpeckers may live there during intervals between fires.

In addition, the following assumptions were made:

The SIMPPLLE model is dependent upon stand-level data (R1-VMap) and thus is unable to incorporate snag densities. We assume that nest snags in burned forests exist in sufficient numbers for black-backed woodpeckers (Hitchcox, 1996). Further, the availability of nest snags within burned forests has not been found to be limiting for black-backed woodpeckers.

2.5.6 Olive-sided Flycatcher

Olive-sided flycatchers (*Contopus cooperi*) are found in montane and northern coniferous forests, most often in forest openings, forest edges near natural openings (meadows, canyons, rivers) or human-made openings, and in open to semi-open forest stands (Altman & Sallabanks, 2012). They can be found in dry to moist sites across a range of elevations. Occurrence of olive-sided flycatchers is influenced by the presence of relatively open canopies, tall trees for aerial fly-catching/foraging, and perches for singing (Altman & Sallabanks, 2012).

In mixed conifer forests and in redcedar-western hemlock forests in Idaho, olive-sided flycatchers were found to be significantly more abundant in a matrix of clearcuts than in landscapes of old-growth forest (Evans & Finch, 1994; Sally J. Hejl & Paige, 1994). Hutto and Young (1999) found olive-sided

flycatchers were more abundant in early post-fire habitats than in any other major cover types, although they had similar occurrence in seed tree cover types and were only slightly less common in clearcut and shelterwood cover types, occurring more frequently in disturbed than in undisturbed forest in the northern Rockies. Intermediate successional stages (e.g., dense even-aged sapling-pole or mature forests) are generally not suitable. Consequently, regional shifts in logging practices or decadal-scale fluctuations in fire occurrence could create local or regional variation in habitat availability, without necessarily leading to a net decline in habitat (Kotliar, 2007).

Query Design

The query design for olive-sided flycatcher includes the following layers:

- Cover type: Douglas-fir through subalpine fir
- Habitat groups:
 - ◆ B1, warm and dry
 - ◆ B2, moderately warm and dry
 - ◆ B3, warm and moderately moist
 - ◆ C1, moderately warm and moderately moist
 - ◆ C2, moderately warm and moist
 - ◆ D1, moderately cool and moist
 - ◆ D3A, lower elevation cool moist to moderately dry with white pine (subalpine fir, *Picea*)
 - ◆ D3B, higher elevation cool moist to moderately dry with whitebark pine (subalpine fir, mountain hemlock)
 - ◆ E1, moderately cool and wet
 - ◆ E2, cool and wet
 - ◆ F1, cool and moderately dry
 - ◆ F2, moderately cool and moderately dry
- To determine both the mid-seral forest as well as openings that olive-sided flycatchers require, two distinct tree size classes were examined:
 - ◆ 0-5-inch d.b.h.
 - ◆ \geq 9-inch d.b.h., including:
 - 9-14.9-inch d.b.h.
 - 15-19.9-inch d.b.h.
 - \geq 20-inch d.b.h.
- For the same reason as above, we examined two distinct canopy cover classes:
 - ◆ Within the 0-5-inch d.b.h. size class: all canopy covers 15-100 percent
 - ◆ Within the \geq 9-inch d.b.h. size class: 15 percent-69.9 percent canopy cover, including:
 - 15-39.9 percent
 - 40-69.9 percent

In addition, the following assumptions were made:

Olive-sided flycatchers require edges between openings and stands of mature forest. Analysis of seedling/sapling habitat (at all canopy cover levels) adequately represented openings in the landscape. The relative abundance of the seedling/sapling habitat and mature forest habitat was assessed in the time series modeling results.

We assume that if the ratio of seedling/sapling to mature forest stays within natural range of variation (as defined by SIMPPLLe modeling (see section 2.3) over the five-decade period, then olive-sided flycatchers will not be at risk. If either openings or mature forests drop to levels below natural range of variation, then olive-sided flycatchers would be determined to be at risk. Some forest patches modeled as providing habitat for black-backed woodpeckers may also provide habitat for olive-sided flycatchers. Olive-sided flycatchers may be found to be at no risk at the planning unit scale but will be at risk in certain landscapes for a given time period as a consequence of larger than normal wildfires.

2.5.7 Pileated Woodpecker

Pileated woodpeckers (*Dryocopus pileatus*) are most often associated with mature forests (Shackelford & Conner, 1997; USDA, 2000). The species is a primary cavity excavator that nests in western larch, ponderosa pine, and black cottonwood (*Populus trichocarpa*) snags (Bull, 1987; McClelland, 1977). In Montana, pileated woodpeckers select larch for nesting more frequently than other tree species, followed by ponderosa pine, black cottonwood, aspen, western white pine, grand fir, and lastly, Douglas-fir (McClelland & McClelland, 1999). Snags selected for nesting are very large diameter (≥ 20 -inch d.b.h.) and tall (≥ 40 feet) (Bull, 1987; McClelland, 1977). Bull and Holthausen (1993) found that pileated woodpecker abundance increased as the amount of forest without logging, > 60 percent canopy closure, and old-growth trees increased.

In recent decades, many forests inhabited by pileated woodpeckers have changed considerably from large continuous areas of mature and old forests with dense canopy cover (Bull & Holthausen, 1993) to relatively open canopies (< 30 percent closure) with an increasing number of snags and logs as a result of increased levels of insect infestation. Bull et al. (2007) studied the density of nesting pairs and traditional home ranges of pileated woodpeckers in two study areas over a 30-year period, and in five additional study areas over 15 years following extensive insect-caused tree mortality and timber harvest (during the 1990s). Although canopy closure declined due to tree mortality in five of the seven areas they studied and some of the forests were no longer classified as old growth, they continued to function as habitat for pileated woodpeckers because of the nesting, roosting, and foraging habitat provided. As a result, modeling included forests with average VMap diameter classes greater than 15 inches d.b.h. and greater than 15 percent canopy cover that are likely to include foraging habitat as well as some very large nest and roost trees.

Query Design

The query design for pileated woodpecker includes the following layers:

- Habitat Groups:
 - ♦ A2, warm and very dry
 - ♦ B1, warm and dry
 - ♦ B2, moderately warm and dry
 - ♦ B3, warm and moderately moist

- ◆ C1, moderately warm and moderately moist
- ◆ C2, moderately warm and moist
- ◆ D1, moderately cool and moist
- ◆ D3A, lower elevation cool moist to moderately dry with white pine (subalpine fir, *Picea*)
- ◆ D3B, higher elevation cool moist to moderately dry with whitebark pine (subalpine fir, mountain hemlock)
- ◆ E1, moderately cool and wet
- ◆ E2, cool and wet
- ◆ F1, cool and moderately dry

For nesting, pileated woodpeckers selectively prefer western larch, and ponderosa pine for nest sites, followed by black cottonwood, aspen, western white pine, grand fir, and lastly, Douglas-fir (McClelland & McClelland, 1999).

Thus, the following cover types were included for suitable habitat:

- 'CW', 'CW-ES-AF', 'DF', 'DF-AF', 'DF-C', 'DF-C-ES-AF', 'DF-ES', 'DF-ES-AF', 'DF-GF', 'DF-LP', 'DF-LP-AF', 'DF-LP-ES', 'DF-LP-ES-AF', 'DF-PP-GF', 'DF-PP-LP', 'DF-WP', 'DF-WP-AF', 'DF-WP-ES', 'DF-WP-ES-AF', 'WB-DF-ES-AF', 'DF-WP-GF', 'L', 'L-C', 'L-C-ES-AF', 'L-DF', 'L-DF-AF', 'L-DF-C', 'L-DF-ES', 'L-DF-ES-AF', 'L-DF-GF', 'L-DF-LP', 'L-DF-PP', 'L-DF-WP', 'L-ES', 'L-ES-AF', 'L-GF', 'L-LP', 'L-LP-AF', 'L-LP-ES', 'L-LP-ES-AF', 'L-LP-GF', 'L-PP', 'L-PP-LP', 'L-WP', 'L-WP-C', 'L-WP-GF', 'PP', 'PP-DF'
- Tree size class: > 15-inch d.b.h., including:
 - ◆ 15-19.9-inch d.b.h.
 - ◆ \geq 20-inch d.b.h.
- Stands > 15 percent canopy cover, including:
 - ◆ 15-39.9 percent
 - ◆ 40-69.9 percent
 - ◆ 70-100 percent
 - ◆ Exclusion of the lowest canopy cover class to rule out forest with regeneration or salvage harvest.

In addition, the following assumptions were made:

Although pileated woodpeckers use very large-diameter snags and live trees with heart rot for nesting, the SIMPPLLE model is dependent upon R1-VMap and did not allow the incorporation of very large snag densities. The Flathead National Forest used Forest Inventory and Analysis summary data to determine the number of acres with at least 8 or 10 large (15-19.9-inch d.b.h.) and very large (> 20 -inch d.b.h.) trees per acre (depending on habitat type group). A R1-VMap texture file was then used to spatially map those acres. Forest Inventory and Analysis data were also evaluated to ensure that sufficient large snags exist at the forest scale to provide nesting habitat, assuming random distribution.

2.5.8 Moose and Elk Forage

Forage for moose and elk was modeled due to changes in scientific knowledge that have occurred over the last few decades and a desire to model predicted changes in habitat in the future. A century of research on elk (Toweill & Thomas, 2002) consistently concluded that the limiting factor on elk populations was access to winter ranges containing substantial amounts of forage. Forage availability on summer range was considered abundant under all combinations of disturbance (wildfire, logging, grazing) or lack thereof (wildfire suppression) and not limiting to populations. The first forest plans in the Northern Region reflected that philosophy (USDA, 1986b). Winter ranges were designated and targeted for periodic prescribed burning or logging designed to mimic low-severity wildfires. Human disturbance was often precluded during the winter to avoid displacing wintering elk. Concerns regarding summer range were generally focused on retaining adequate security (Hillis et al., 1991) designed to slow the hunter harvest and retain branch-antlered bulls in the post-season population.

That model appeared to be adequate through the 20th century. Elk populations that were reestablished in the 1930s and 1940s (after near extirpation due to unregulated harvest and market hunting) increased through the 1960s and 1970s and were declared in many herd units to be at carrying capacity. Populations in western Montana continued to increase in the 1990s, raising Montana Fish, Wildlife, & Parks (MFWP) concerns about achieving sufficient harvest to minimize landowner conflicts.

In the 1970s, elk populations in the Selway herd unit of northern Idaho, an area characterized by dense coniferous forests mostly within a designated wilderness, began to decline. That decline has continued into the 2010s to the extent that populations today are only about 10 percent of what they were prior to the 1970s. Elk populations within other northern Idaho herd units have not shown declines; however, those herd units contained substantial amounts of natural openings, agricultural lands, or industrial forest lands. This suggested that within herd units dominated by dense forest and a lack of natural disturbance (i.e., wildfire, or human disturbance that mimicked wildfire), limited summer range forage could be the cause of population declines. Although elk populations on the Flathead National Forest have not suffered the declines that the Selway has, forest conditions on the Forest are similar in some areas in that natural openings are scarce and coniferous forests are dense unless maintained by fire or timber harvest.

Ongoing research (Proffitt et al., 2015) in the Bitterroot National Forest suggests forage availability on the summer range does affect elk populations, as much or more than winter range forage availability. Other recent studies have also indicated that management can be improved by integrating nutritional ecology on elk summer range (Cook et al., 2001). For example, many of the important food plants, including shrubs such as red stem ceanothus, serviceberry, and Rocky Mountain maple, as well as grasses, grow only in forest openings or in forests with a more open canopy. Controlled burns or other vegetation management strategies aimed at creating a mosaic of forest conditions can be especially beneficial by providing abundant food resources in close proximity to cover. Furthermore, Proffitt et al. (2015) suggest that a lack of disturbance due to long-term wildfire suppression was largely responsible for population declines in some areas. Proffitt et al. (2015) also studied effects of elk calf survival from predation. Although wolf populations in the area were high, they found substantially greater predation from mountain lions.

Moose are more specialized than elk and tend to utilize more mesic sites with dense shrub communities. Since the 1990s, populations in Montana appear to have declined, as evidenced by aerial survey trends and hunter harvest statistics, but the significance and causes of the apparent trends were unknown (Smucker, Garrot, & Gude, 2011). In 2013, MFWP began a 10-year study designed to improve understanding of means to monitor the current status and trends of moose populations as well as the relative importance of factors limiting population growth (DeCesare et al., 2012).

Throughout northwest Montana, moose populations increased and expanded in range through the early 1990s, which is believed to be due to prevalence of early successional forest created by fire and timber harvest (Brown, 2006), which is generally favorable to moose. Moose frequently use both logged and burned forest habitat in the first 10 to 30 years (Brown, 2006; Smucker et al., 2011; Telfer, 1995). In the Yaak River drainage of northwest Montana, moose selected clearcut areas logged 15–30 years previously, as well as areas within 100 meters of a cutting unit (Matchett, 1985). Across western Montana, sharp declines in timber harvest on national forest lands during the 1990s resulted in less early successional forest habitat than existed 50 years ago (Smucker et al., 2011). This trend is now being reversed in some areas of the Flathead National Forest due to an increase in wildfires that have occurred since 2000. Although shrub-dominated habitats are used year-round, these areas are very important in winter because they provide much higher quantity and quality of forage compared to other available habitats (Van Dyke, Probert, & Van Beek, 1995). Studies suggest that wildfire may be most beneficial to moose when a mosaic of burned and unburned forest patches is created at a landscape level. In many areas, moose forage in willow habitats until snow depth increases and then they move into conifer forests, where they forage on subalpine fir (Tyers, 2003) and yew.

The query design for ungulate foraging habitat includes the following layers:

- Habitat group/cover type: subalpine fir series, including the following habitat groups:
 - ♦ B1, warm and dry
 - ♦ B2, moderately warm and dry
 - ♦ B3, warm and moderately moist
 - ♦ C1, moderately warm and moderately moist
 - ♦ C2, moderately warm and moist
 - ♦ D1, moderately cool and moist
 - ♦ D3A, lower elevation cool moist to moderately dry with white pine (subalpine fir, *Picea*)
 - ♦ D3B, higher elevation cool moist to moderately dry with whitebark pine (subalpine fir, mountain hemlock)
 - ♦ E1, moderately cool and wet
 - ♦ E2, cool and wet
 - ♦ F1, cool and moderately dry
 - ♦ F2, moderately cool and moderately dry
 - ♦ G1, cold and moist
- The following habitat groups were included for elk only:
 - ♦ All non-forested grassland habitat groups (NF1, NF1A, etc.)
- Tree size class: 0-5-inch d.b.h. seedling/sapling
- Canopy cover 0-100 percent, or combinations of:
- Tree size \geq 15-inch d.b.h. with:
 - Canopy cover 0-15 percent

In addition, the following assumptions were made:

Although elk security habitat is important, the SIMPPLLE model is dependent upon R1-VMap and did not allow the incorporation of road management data. On the Flathead National Forest, elk security habitat is modeled using other methods.

2.5.9 White-tailed Deer Winter Habitat Snow-Intercept Cover

Snow-intercept cover for white-tailed deer was modeled due to changes in scientific knowledge that have occurred over the last few decades and a desire to model predicted changes in habitat in the future. Research by Munding (1982; 1984) in the Swan Valley of Montana strongly tied white-tailed deer winter survival to mature conifers with dense canopy closure. Munding (1982; 1984) concluded that even though forage was limited under dense canopies, snow interception provided by dense canopies allowed white-tailed deer to move around and find limited winter forage and avoid the substantial caloric expenditure that would have been expended by plunging through deep snow within forest openings or under more open stands. MFWP subsequently found that wintering white-tailed deer on the Flathead National Forest foraged on arboreal lichens that were hanging on coniferous forest branches or had been blown to the ground by wind (T. Their, MFWP, personal communication, 2010). Other researchers (Toweill & Thomas, 2002) acknowledge that of all native ungulates, white-tailed deer are the least capable of surviving deep snow. Current forest plan (USDA, 1986a) measures accommodate wintering white-tailed deer based on these and other Montana Fish, Wildlife and Parks recommendations..

Although Munding's (1982; 1984) findings are irrefutable based on the habitat and winter weather conditions he studied in the 1970s, changes in low-elevation snowpack conditions associated with a changing climate may reduce the importance of snow-intercept cover in the future. The severe winter conditions under which Munding did his research in the 1970s have become increasingly milder, especially at low elevations where white-tailed deer winter. Although extreme winter weather conditions still occur (e.g., US Weather Service data indicates that the winter of 1996-97 stands as a fairly severe year in terms of total snowfall), the occurrence and duration of these severe events is becoming increasingly uncommon and of much shorter duration.

In addition, the 2012 planning rule (USDA, 2012) requires an ecosystem and biodiversity approach to national forest management. Mixed ponderosa pine, western larch, and Douglas-fir communities, which provide essential habitat for flammulated owls, require frequent disturbance resulting in relatively open canopies and open understories. Survival and continuous recruitment of very large ponderosa pine and western larch trees needed for nesting by pileated woodpeckers is increased where stand densities are lower and stand-replacing fires are less frequent. Measures that would optimize cover for either wintering white-tailed deer or nesting flammulated owls and pileated woodpeckers are clearly opposed to each other at the scale of a forest stand. Measures to protect winter white-tailed deer habitat may be less important during the new "norm" of relatively warm, low-snow winters in the intermountain valleys. However, because there is uncertainty regarding winter precipitation in models of future climate, the Flathead National Forest incorporated parameters into its modeling of alternatives at a landscape scale. Snow-intercept cover is modeled as forests with an average diameter class of at least 10 inches and at least 40 percent canopy cover. Similar to fisher, forest with a canopy cover class less than 15 percent was defined as an opening for purposes of modeling future vegetation treatments. In landscape areas mapped as white-tailed winter habitat by MFWP, no more than 30 percent of the habitat could be in an opening at any given time (ERG, 2015).

Query Design

The query design for white-tailed deer winter range includes the following:

- MFWP winter white-tailed deer habitat layer

- Cover type: All, excluding high elevation alpine cover types WB, WB-ES-AF, and AL-WB-AF
- Habitat groups:
 - ♦ A2, warm and very dry
 - ♦ B1, warm and dry
 - ♦ B2, moderately warm and dry
 - ♦ B3, warm and moderately moist
 - ♦ C1, moderately warm and moderately moist
 - ♦ C2, moderately warm and moist
 - ♦ D1, moderately cool and moist
 - ♦ D3A, lower elevation cool moist to moderately dry with white pine (subalpine fir, *Picea*)
 - ♦ D3B, higher elevation cool moist to moderately dry with whitebark pine (subalpine fir, mountain hemlock)
 - ♦ E1, moderately cool and wet
 - ♦ E2, cool and wet
 - ♦ F1, cool and moderately dry
 - ♦ F2, moderately cool and moderately dry
- Tree size class > 10-inch d.b.h., including:
 - ♦ 10-14.9-inch d.b.h.
 - ♦ 15-19.9-inch d.b.h.
 - ♦ 20+-inch d.b.h.
- Stands > 40 percent canopy cover, including:
 - ♦ 40-69.9 percent
 - ♦ 70-100 percent

2.5.10 Habitat Connectivity

Connectivity, as coined in 1984 by Merriam (USDA, 1997), refers both to the abundance and spatial patterning of habitat and to the ability of animals to move from patch to patch of similar habitat. Structural connectivity is the physical relationship between patches of habitat or other ecological units; functional connectivity is the degree to which landscapes actually facilitate or impede the movement of organisms and processes of ecosystems (Ament, Callahan, McClure, Reuling, & Tabor, 2014). Corridors are a means by which connectivity can be provided. They are strips or stepping stones of “hospitable territory traversing inhospitable territory providing access from one area to another” (USDA, 1997). The effectiveness of a corridor depends upon the species using it, the type of movement, and the type of corridor (Hunter, 1996). Animals need connectivity to forage within their home range, for dispersal to new home ranges, for migration between locations, and for genetic interaction between meta-populations. According to American Wildlands (American Wildlands, 2008), maintaining the ecological connections, or wildlife movement corridors, between major wildland habitats is one of the most pressing challenges for habitat and wildlife conservation in the northern Rockies today.

Many connectivity or corridor studies focused on single species, but in recent years there has been more emphasis considering connectivity for multiple species at a large landscape scale. In 2007, American Wildlands initiated a *Priority Linkage Assessment* that identified, catalogued, and prioritized the threats to, and opportunities for, maintaining connectivity in the northern Rockies. The outputs of the assessment included a GIS shapefile that contained polygons of major linkages, species of concern in each, priority of each linkage, and a field that distinguishes which linkages are used for seasonal movement (American Wildlands, 2008). In 2015, the Nature Conservancy mapped the “penetrability” of the terrestrial landscape across the Pacific Northwest.

The availability and arrangement of vegetative cover may affect connectivity for some animals. Some species, such as marten, require moderate to high canopy cover (Ruggiero et al., 1994) with forest interior conditions to help them avoid predators, whereas other species prefer more open or mixed habitats (Tomson, 1999). Characteristics favorable for corridor/linkage zone functionality for most species, especially the large carnivores, include low road density, low concentrations of human occupancy, an abundance of productive foraging habitat, a robust mix of forested and non-forested habitats with abundant edge, and gentle to moderate terrain (Craighead & Vyse, 1996; Servheen, Waller, & Sandstrom, 2001; Walker & Craighead, 1997). In general, a variety of open habitats such as montane grasslands, wet meadows, shrublands, early-seral forest, riparian shrub associations, open-growth forest, talus slopes, and burns generously distributed amongst blocks of mature interior forest provide a favorable linkage environment that will accommodate a wider variety of species than unbroken forest alone (Costain, 2009).

Although there is no empirical evidence to support the concept of corridors (Rosenberg, Noon, & Meslow, 1997), many conceptual models have been built to project connectivity across landscapes (Noss, Quigley, Hornocker, Merrill, & Paquet, 1996; Walker & Craighead, 1997). For example, the Northern Region Connectivity Protocol (USDA, 1997) provides a framework for describing corridors and the effects of forest projects and other human activities. The aforementioned research suggests that sustaining historic mixes of vegetation in terms of cover types, size classes, and patch sizes and arrangement all contribute to sustaining well-distributed wildlife populations and avoiding genetically isolated populations. Much of the research focuses on habitat fragmentation and isolation caused by urbanization and residential development, which are prevalent in the Flathead Valley near Kalispell, but fortunately are not a problem on large blocks of national forest land such as the Flathead National Forest. Rather, barriers to animal movement are more likely to occur on adjacent private, developed lands.

The 2012 planning rule (USDA, 2012) includes a requirement that plan components for ecosystem integrity (including connectivity) must take into account the interdependence of terrestrial and aquatic ecosystems (219.8(a)(1)). There is an additional requirement in the 2012 planning rule to maintain or restore the ecological integrity of riparian areas, “including plan components to maintain or restore structure, function, composition, and connectivity . . .” (219.8(a)). Public comments on forest plans, wilderness legislation, or individual projects often suggest that the establishment of large, permanent reserves of late seral forest be provided for habitat connectivity. Such permanent reserves may indeed provide long-term habitat when located within disturbance regimes where natural disturbances are infrequent or occur at very small scales. Within the northern Rockies, however, natural, unavoidable disturbances like wildfire, insect outbreaks, or root disease make the benefits of permanent reserves more questionable. Recognition of the role of natural disturbance on the Flathead National Forest necessitates an acceptance that connectivity provided by forest cover will change over time at a small or intermediate scale and that most species are adapted to such changes, but that rapid succession will maintain connectivity at a large scale.

Query Design

Connectivity within the American Wildlands (American Wildlands, 2008) polygons, addressing multiple species, is used for the query below. Recognizing that connectivity for some species is affected by a lack of habitat components that take a long period of time to restore (Haber & Nelson, 2015), connectivity across the Flathead National Forest was modeled using the query design for marten because they are one of the species that is more limited by the amount and arrangement of mature tree cover. As a means of assessing long-term habitat connectivity, and as a means of assessing the benefits of permanent reserves, sample landscapes at years 2015 and 2065 were compared by acres of marten habitat, average patch size, and percent habitat occurring in 2015 against the modeled habitat that still remained at 2065. Figure 3-2 presents the American Wildlands polygons in the vicinity of the Forest and those selected for this analysis. Polygons were selected for analysis if they contained lands managed by the Forest. The percentage of National Forest System lands in each connectivity area is displayed in Table 3-2.

The query design for connectivity includes the following:

- American Wildlands selected polygon layer
- Cover types: cool Douglas-fir through subalpine fir
- Habitat groups:
 - ◆ B3, warm and moderately moist
 - ◆ C1, moderately warm and moderately moist
 - ◆ C2, moderately warm and moist
 - ◆ D1, moderately cool and moist
 - ◆ D3A, lower elevation cool moist to moderately dry with white pine (subalpine fir, *Picea*)
 - ◆ D3B, higher elevation cool moist to moderately dry with whitebark pine (subalpine fir, mountain hemlock)
 - ◆ E1, moderately cool and wet
 - ◆ E2, cool and wet
 - ◆ F1, cool and moderately dry
 - ◆ F2, moderately cool and moderately dry
 - ◆ G1, cold and moist
- Tree size class: > 10-inch d.b.h. including:
 - ◆ 10-14.9-inch d.b.h.
 - ◆ 15-19.9-inch d.b.h.
 - ◆ > 20-inch d.b.h.
- Stands > 40-100 percent canopy cover, including:
 - ◆ 40-69.9 percent
 - ◆ 70-100 percent

The query above is identified as *dense, mature tree cover*. Although forest stands in the 5-9.9-inch d.b.h. class provide cover for connectivity and will be used by many forest associates, they may not have the structural complexity to be used by all species. Thus, the connectivity model provides a conservative

model of landscape-level connectivity for forest interior species. Nonetheless, cover provided by even moderately dense pole or medium sized stands (5-9.9 and 10-15 inch d.b.h.) stands likely contributes to the ability of wide-ranging carnivores to move across the landscape. For that reason, an additional query identified as *cover* were applied to the aforementioned corridors identified by American Wildlands.

- Cover types:
 - ◆ All forested cover types
- Habitat groups:
 - ◆ All forested habitat
- Tree size class: > 5-inch d.b.h., including:
 - ◆ 5-9.9 inch d.b.h.
 - ◆ 10-14.9-inch d.b.h.
 - ◆ 15-19.9-inch d.b.h.
 - ◆ > 20-inch d.b.h.
- Stands > 40-100 percent canopy cover, including:
 - ◆ 40-69.9 percent
 - ◆ 70-100 percent

In addition, the following assumptions were made:

American Wildlands connectivity polygons on the Flathead National Forest do not include existing wilderness areas or the Jewel Basin Hiking Area, but these areas have relatively low levels of human influence. The specific effects of roads and human development on connectivity areas were not considered in this query but are considered elsewhere (for example, refer to the final EIS sections 3.7.4 and 3.7.5 and the following figures in appendix 1 of the final EIS: 1-30, elk security in hunting season; 1-38, grizzly bear security core in alternative A; and 1-39 through 1-41, grizzly bear secure core in alternatives B modified, C, and D).

Table 3-2. Land management jurisdiction within the American Wildlands polygons

Connectivity Area Name	Forest Service acres	Forest Service %	State acres	State %	Other acres	Other %	Total Acres
Big Mountain	17,241	40.3%	4,528	10.6%	20,978	49.1%	42,748
Camas Creek	10,780	99.5%	--	0.0%	51	0.5%	10,831
Coram	68,775	85.5%	--	0.0%	11,676	14.5%	80,451
Essex	18,636	94.2%	--	0.0%	1,144	5.8%	19,780
Haskill Basin	39,797	41.1%	1,006	1.0%	56,141	57.9%	96,944
Idaho Hill	14,214	14.2%	5,565	5.6%	80,302	80.2%	100,081
Lost Trail - Kenelty	15,318	83.0%	--	0.0%	3,131	17.0%	18,449
North Fork	20,727	54.1%	5,634	14.7%	11,948	31.2%	38,308
North Whitefish Range	75,776	96.3%	611	0.8%	2,290	2.9%	78,676
Nyack Pinnacle	63,410	96.4%	344	0.5%	2,022	3.1%	65,776
Seeley-Clearwater	250,944	73.0%	52,202	15.2%	40,848	11.9%	343,993

Connectivity Area Name	Forest Service acres	Forest Service %	State acres	State %	Other acres	Other %	Total Acres
South Glacier	40,104	97.2%	--	0.0%	1,166	2.8%	41,270
Swan Lake	15,123	76.3%	475	2.4%	4,226	21.3%	19,825
Swift Creek - Stillwater	130,901	64.0%	44,638	21.8%	29,150	14.2%	204,690
Total	781,746	67.3%	115,002	9.9%	265,073	22.8%	1,161,822

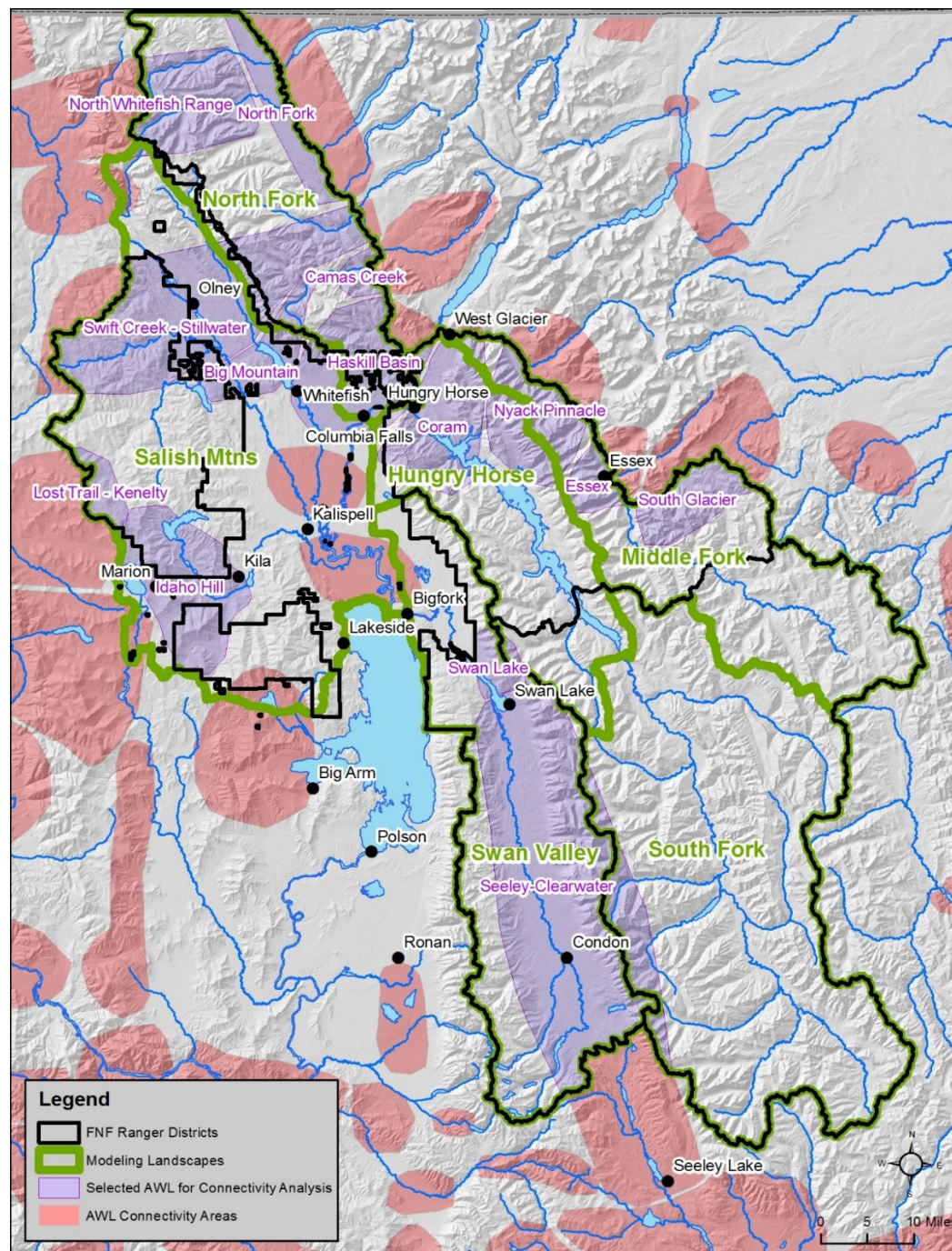


Figure 3-2. Flathead National Forest selected American Wildlands polygons for the connectivity analysis

2.5.11 Riparian Habitat Conservation Area or Riparian Management Zone Species

In the Northern Region, riparian shrub and deciduous tree communities are generally considered to provide the highest levels of species diversity (Hutto & Young, 1999). Avian species occupying riparian shrub and deciduous tree communities include species such as the American redstart, Wilson warbler, northern waterthrush, veery, catbird, and long-billed marsh wren. Several species of bats also forage at levels disproportionate to habitat availability above riparian shrub and deciduous tree communities.

In the mountainous West, riparian shrub and deciduous tree communities are disturbance dependent. On wide, low-gradient drainages (e.g., the Swan River), periodic flooding maintains a very highly convoluted pattern of meanders, sloughs, and oxbow lakes. Because this pattern is changing constantly due to periodic flooding, cottonwoods and shrubs are the predominant vegetation, whereas conifers are patchier and somewhat episodic since they only become established in the intervals between flooding events. Beaver activity also helps to maintain cottonwood/shrub communities and complements the effects of flooding. In the West, impoundments have interrupted this cycle to the detriment of cottonwood/shrub communities. The only large impoundment affecting Flathead National Forest lands is the Hungry Horse Reservoir, which was completed in 1953. Hungry Horse Dam inundated a segment of the South Fork of the Flathead River and flooded an estimated 6,867 acres of riparian/wetland wildlife habitats, according to MFWP.

Unlike low-gradient streams, moderate- or steep-gradient streams (e.g., Bowman Creek) tend to be bedrock controlled. Flooding generally has little effect on the amount of sinuosity. Conversely, wildfires, insect outbreaks, or human activities that mimic those natural disturbances limit conifer cover and allow dense communities of riparian shrubs to occupy riparian zones. Beavers occur within moderate and steep-gradient streams, however, their influence upon the shrub community is much less than within low-gradient streams. In the absence of disturbance, conifers will quickly reoccupy upland riparian zones and to varying degrees will shade out riparian shrubs.

Two human activities affecting natural disturbances in moderate- and steep-gradient streams include fire suppression and riparian habitat conservation area or riparian management zone protective measures. Wildfire history data suggest wildfire-burned acreages in the 20th century declined during the mid-1900s until the 1980s, when fuel accumulations and warmer and drier weather began a trend of increasing acreage and severity of wildfires. Wildland fire burned approximately 1,230,000 acres from 1889 to 1929 in the vicinity of the Flathead National Forest, about 40,000 acres between the 1930 and 1979, and about 575,000 acres in or adjacent to the Forest from 1980-2012 (USDA, 2013), including some riparian areas.

Because deciduous trees and shrubs along low-gradient streams are maintained by periodic flooding, the query is designed to model those riparian deciduous communities that are maintained by other disturbance factors such as fires, insects, and disease. The query is designed to assess the availability of habitats that provide shrubs and deciduous trees within riparian habitat conservation areas/riparian management zones. For timestep zero, a GIS layer including the locations of all VMap polygons with cover types dominated by shrubs and deciduous trees was used, including VMap DOM mid-40 shrub, MX-POTR5, and MX-POPUL. For purposes of modeling future vegetation treatments, there were minimal treatments in landscape areas mapped as riparian habitat conservation areas/riparian management zones because these areas are not suitable for timber production (ERG, 2015). Transitional forests resulting from moderate- or high-severity wildfires and insect/disease within 20 years following disturbance was used to model future forest openings containing riparian shrubs and hardwood trees. Since the VMap cover class 0-14.9 percent may be lacking in trees but contain dense shrubs, it was included in the model. On the Flathead National Forest, once mixed conifer stands in upland riparian areas reach an average d.b.h. of 5 inches, the presence of deciduous trees and shrubs has often been greatly reduced or eliminated due to conifer

competition and shading, so these forests were not included for purposes of future modeling of highly suitable habitat for species associated with riparian shrubs and deciduous trees.

Query Design

The query design for riparian species associated with shrubs and deciduous (hardwood) tree communities that are not maintained by flooding includes the following layers:

- the Flathead National riparian habitat conservation area layer (2013)
- Sloping, moderate and high gradient streams > 4 percent slope
- Habitat groups:
 - ◆ All that occur within the riparian habitat conservation area layer
- Tree size class < 5-inch d.b.h., including:
 - ◆ 0-4.9-inch d.b.h.
- Stands of all canopy cover, including:
 - ◆ 0-14.9 percent
 - ◆ 15-39.9 percent
 - ◆ 40-69.9 percent
 - ◆ 70-100 percent

2.5.12 Northern Goshawk

In their status review of northern goshawk (*Accipiter gentilis*), the U.S. Fish and Wildlife Service (USFWS) found that northern goshawks typically use mature forests or larger trees for nesting habitat (the nest area); however, they are considered a forest habitat generalist at larger spatial scales (USFWS, 1998b). Northern goshawks typically select nest sites in mature coniferous forests with relatively closed canopies (50-90 percent) and open, multistoried stands (Brewer, Bush, Canfield, & Dohmen, 2009; Kennedy, 2003; Richard T. Reynolds, Graham, & Boyce Jr., 2008; Richard T. Reynolds, Graham, & Reiser, 1992) of at least 30 acres or greater (Richard T. Reynolds, Joy, & Leslie, 1994). Northern goshawks are not limited to continuous old growth (USFWS, 1998a). Greenwald et al. (2005) reviewed all telemetry-based studies of northern goshawks across North America, including a wide range of habitats across the United States, and found that goshawks generally selected stands based on structure but that selection varied by forest type. For example, in lodgepole pine stands, canopy closure ranged from a mean of 34-80 percent and a size of 9-15-inch d.b.h., whereas trees up to 20-inch d.b.h. were selected in mixed species stands. Northern goshawks are adept at finding dense, multistoried microsites suitable for nesting within dry, cold lodgepole pine-dominated stands that otherwise do not appear suitable for nesting (Squires & Ruggiero, 1996). Fledgling success in Montana was higher in landscapes that contained a mix of open and dense forested stands than in landscapes with only dense stands (Clough, 2000). Northern goshawks use all cover types and age classes for foraging habitat (Kennedy, 2003).

Point data on northern goshawk nest locations are abundant across the USFS Northern Region (USDA, 2006). Nest data for 154 northern goshawk nests on the adjacent Idaho Panhandle and Kootenai National Forests were intersected with R1-VMap (Version 11) data to corroborate habitat queries as illustrated in Figure 3-3. The data points were overlaid on a digital elevation model, and the minimum and maximum elevations were analyzed. The maximum elevation was used to determine an upper elevation limit of

7,000 feet for nesting habitat. Trees used as nest sites average 14-inch d.b.h. in the USFS Northern Region (Samson, 2006a).

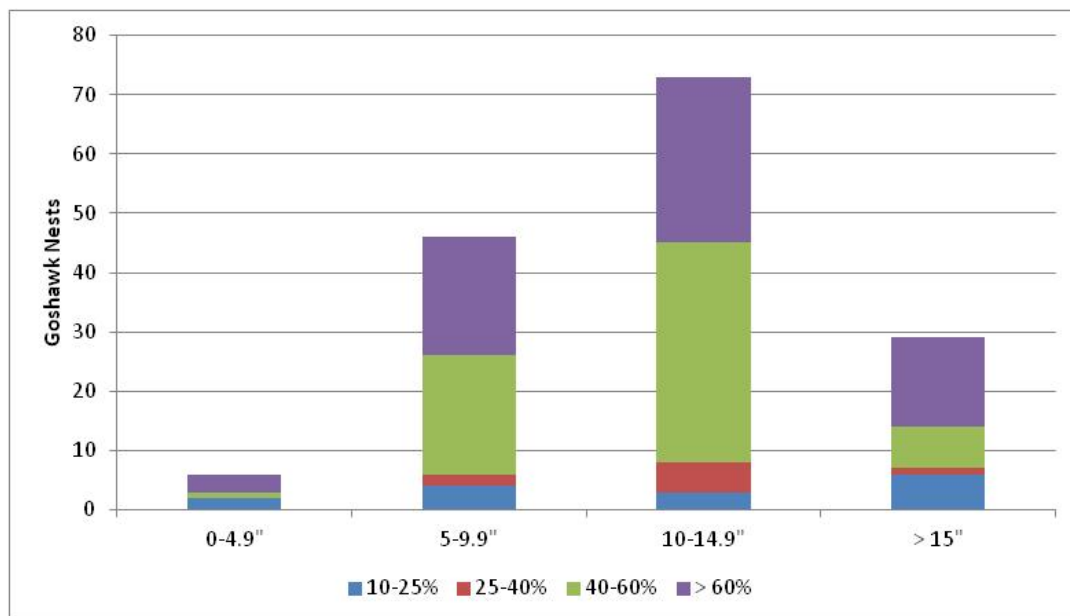


Figure 3-3. Northern goshawk nest location habitat characteristics within the Idaho Panhandle National Forest and Kootenai National Forest

The data suggests that there is a preference for large (10–15-inch d.b.h. and 15+-inch d.b.h.) and a preference for moderately dense (40–60 percent crown closure) and dense (60 percent plus crown closure) stands. Interestingly, a substantial percentage of nests are in stands normally considered too small (< 10-inch d.b.h.), or in stands too open (< 40 percent crown closure) for nesting northern goshawks. This phenomenon is typical for northern goshawk nest distribution and explains why McGrath et al. (2003) had difficulty in predicting suitable nest locations from random sites in a blind sample test. McGrath et al. (2003) concluded from data collected at the nest that such small stands (0–5-inch d.b.h.), or very open stands (10–40 percent crown closure), often contain a microsite of large, dense trees that were undetectable at the stand scale. Squires and Ruggiero (1996) found similar nesting situations in Wyoming, where northern goshawks were nesting in dense, multistoried microsites within lodgepole pine stands that were too small or open to typically support nesting goshawks. Thus, modeling provides a conservative estimate of goshawk nesting habitat.

Query Design

The query design for northern goshawk includes the following layers:

- Cover type: All, excluding high elevation alpine cover types WB, WB-ES-AF, and AL-WB-AF and pure ES-AF cover types that do not include other species such as western larch or Douglas-fir.
- Habitat groups:
 - A2, warm and very dry
 - B1, warm and dry
 - B2, moderately warm and dry
 - B3, warm and moderately moist

- C1, moderately warm and moderately moist
- C2, moderately warm and moist
- D1, moderately cool and moist
- D3A, lower elevation cool moist to moderately dry with white pine (subalpine fir, *Picea*)
- D3B, higher elevation cool moist to moderately dry with whitebark pine (subalpine fir, mountain hemlock)
- E1, moderately cool and wet
- E2, cool and wet
- F1, cool and moderately dry
- F2, moderately cool and moderately dry
- Tree size class > 10-inch d.b.h., including:
 - 10-14.9-inch d.b.h.
 - 15-19.9-inch d.b.h.
 - 20+-inch d.b.h.
- Stands > 40 percent canopy cover, including:
 - 40-69.9 percent
 - 70-100 percent

In addition, the following assumptions were made:

- Ponderosa pine stands may not have > 40 percent crown cover, but ponderosa pine is a very minor component on the Flathead National Forest.
- The northern goshawk habitat model is limited to nesting habitat. It is assumed that post-fledging and foraging habitat is non-limiting (Brewer et al., 2009; Kennedy, 2003).

Chapter 3. Results and Discussion

3.1 Existing Vegetation

Since changes in vegetation over time directly affect the wildlife species assessed in this analysis, the mix of existing vegetation on the Flathead National Forest provides a reference point for comparing future changes as affected by growth, succession, or disturbances. Existing vegetation conditions are categorized by the distribution of size classes and crown closures in Figure 3-4 (note: the Flathead National Forest VMap layer does not have a separate size class of very large trees, so this was modeled using other methods, as explained in the section on pileated woodpecker).

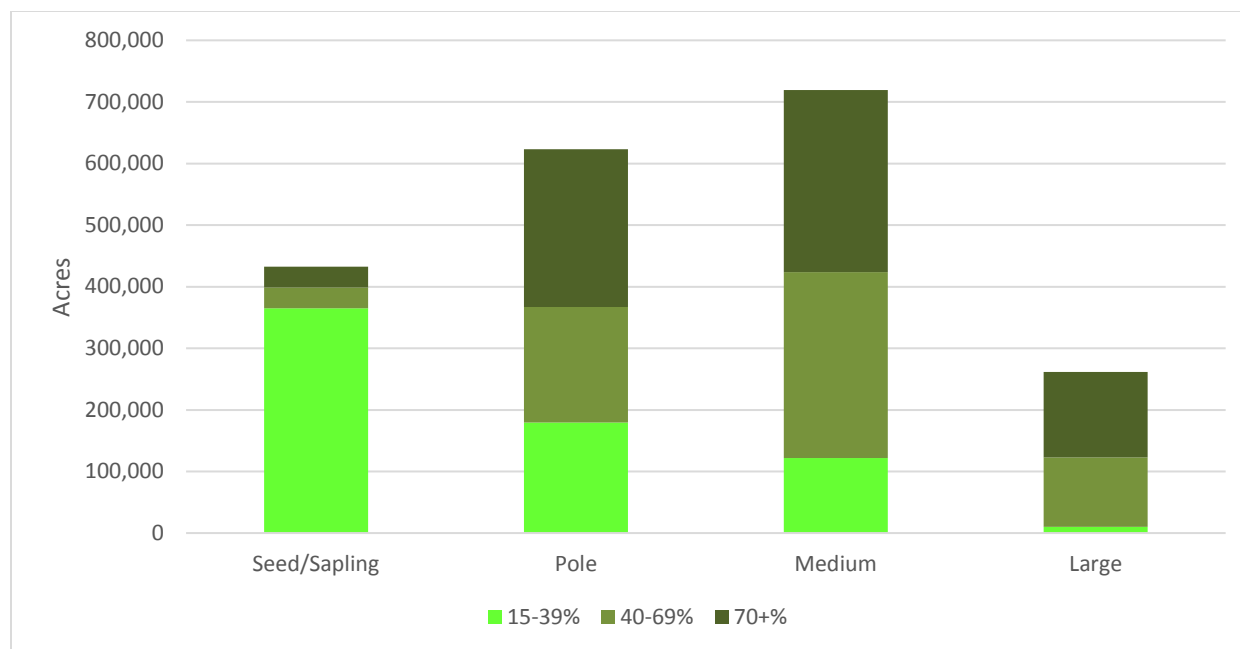


Figure 3-4. Distribution of existing VMap size classes and crown closures

Seedling/sapling = 0-5-inch d.b.h. trees, small = 5-10-inch d.b.h. trees, medium = 10-15-inch d.b.h. trees, and large = greater than 15-inch d.b.h. trees

3.2 Levels of Modeled Disturbance

Disturbances (wildfire, insects, and disease) directly affect the mix of vegetation on the Flathead National Forest and subsequently the quantity of wildlife habitats available over time. Furthermore, disturbances or the lack thereof affect the magnitude and timing of other disturbances. For instance, areas that are burned by high-severity wildfires may be fairly “fireproof” for decades. Conversely, areas that are missed by decades of fire may become vulnerable to insects or disease. The following sections show modeled changes in fire, insects, and disease over time.

Modeled levels of disturbances show the range of conditions that could occur over the next 50 years. High levels of modeled disturbance in decades 3, 4, and 5 are consistent with the trend of downscaled climate model projections and the assumption that the climate will be substantially warmer and drier in timesteps 3, 4 and 5 (however, these conditions could occur sooner or could be more variable from decade to decade). High levels of modeled disturbance also reflect the vulnerability of forested stands that have accumulated fuels and/or are stocked at densities that makes them at risk for moderate- and high-severity wildfires and insect or disease outbreaks.

In the warm-dry and warm-moist biophysical settings that make up about 15 percent of the Flathead National Forest, a high level of modeled disturbance is a logical consequence of the successful, long-term fire suppression that corresponded with a period of cool, wet weather described in Morgan et al. (2008). In the cool-moist and cold biophysical settings that make up over 80 percent of the Forest, this high level of modeled disturbance is consistent with the mean fire return interval. Unlike the Bitterroot National Forest, the moist middle- and upper-elevation subalpine fir habitat types that are common on the Flathead National Forest generally experience high-intensity stand-replacing fires at intervals of 100 years or more. The Coram Experimental Forest on the Flathead National Forest (western larch, Douglas-fir, lodgepole pine, and subalpine fir) has a mean fire return interval of 117-146 years (Sneck, 1977). Although fire suppression has undoubtedly had some influence on fire frequency in these habitat types, the decadal running average of acres burned shows that the Forest is now in a similar pattern to that which occurred

from 1890-1930. High levels of modeled future disturbance on the Forest are consistent with other broad-scale analyses (Hessburg et al., 1999).

Modeled levels of fire by timestep and alternative (Figure 3-5) suggest that fires on the Flathead National Forest will increase, especially at timesteps 3, 4, and 5. These increases correspond with the warmer, drier climatic conditions modeled.

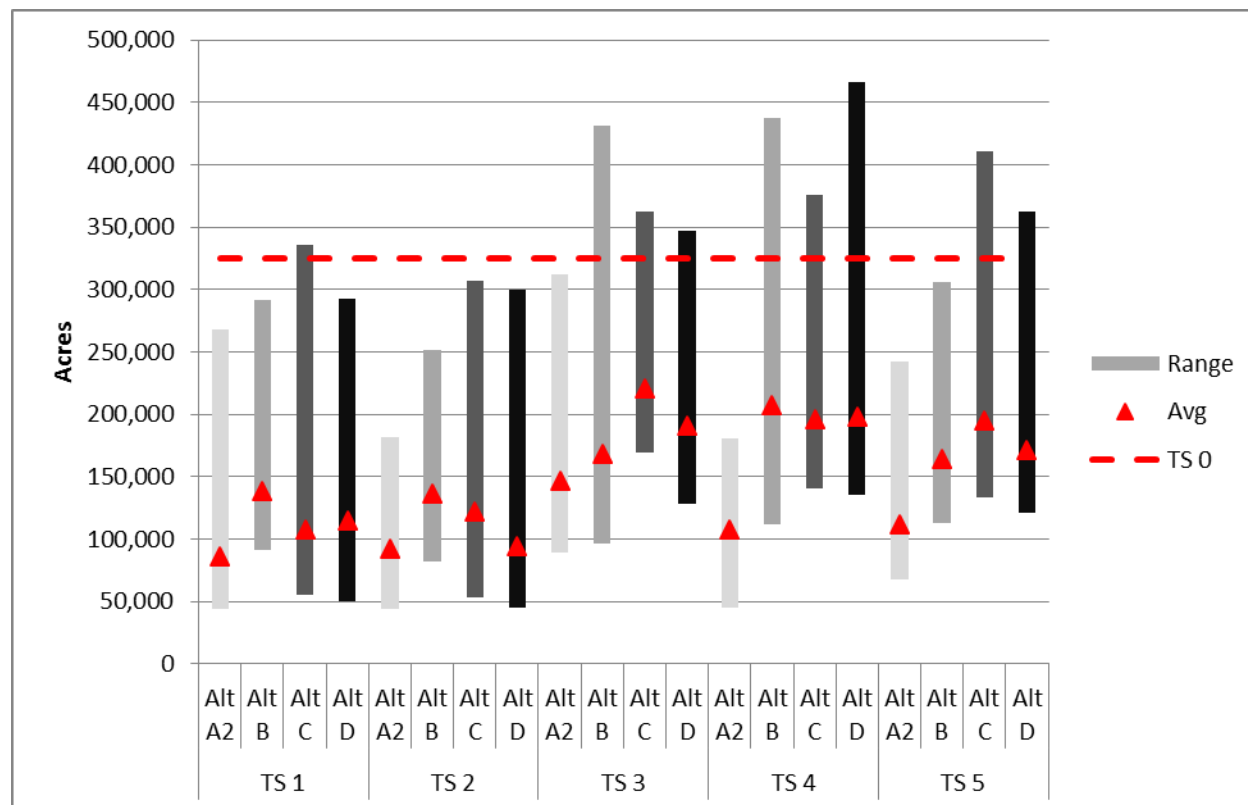


Figure 3-5. Modeled levels of wildfire by alternative

The range of acres burned by timestep is substantial for all alternatives. Of all the variables that affect forest conditions, including tree growth, succession, insects, and disease, fire is the least predictable. The large range of acres burned, modeled over 30 simulations, reflects the high level of variability due to wildfire. The dashed red line depicts the actual acres burned in the last decade, which is close to the upper end of the range of variation for all alternatives except A2 (which does not include modeling of prescribed fire). The average acres burned is much lower than the maximum of the range, indicating that there are many small fires reducing the average size but that there are a few very large fires. The modeled 10-year average trends upward over the 5 decades, as expected with an anticipated trend for warmer, drier summer climatic conditions.

The SIMPPLLE model assumptions were that fire in wilderness was suppressed about 50 percent of the time, response time to fires varied from 0.5 hours (roadside) to 2 days (remote), Class A fires were not caught for wilderness or cool moist fires, and Class A fires in nonwilderness and non-cool moist were caught about 35 percent of the time.

3.2.1 Insects and Disease

Modeled levels of insect and disease activity by timestep and alternative are shown in Figure 3-6. Insects include both bark beetles (e.g., mountain pine beetles) and defoliators (e.g., spruce budworms). Diseases include both native (e.g., Armillaria root disease) and exotic (e.g., white pine blister rust) diseases.

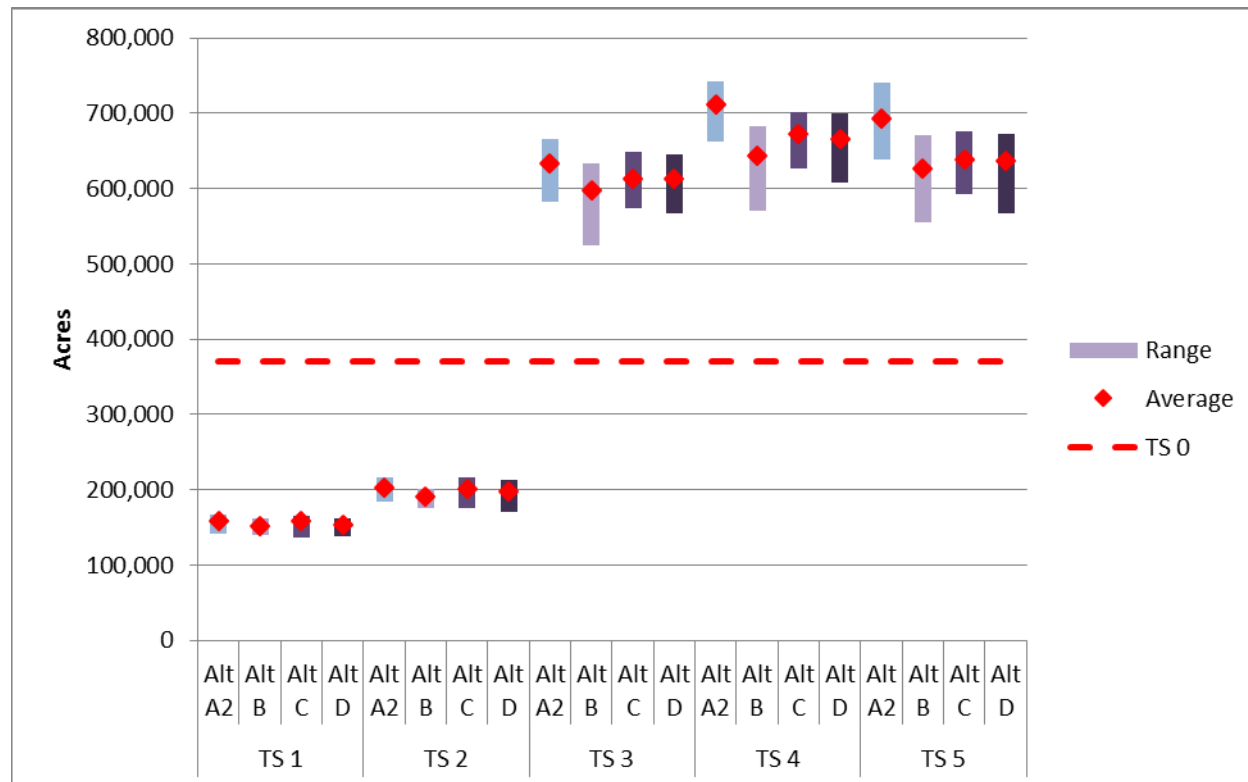


Figure 3-6. Modeled levels of insects and disease by alternative

The increases are consistent with high percentages of pole, large, and very large forested acres combined with high canopy closures and presumed warmer, drier climatic conditions in decades 3 through 5. Modeled outcomes suggest the Flathead National Forest is predisposed to large increases in insect and disease outbreaks.

3.2.2 Relationship of Wildfire to Insects and Disease

Modeled results suggest that levels of insect and disease are directly affected not only by warmer, drier climatic conditions, which makes stands more vulnerable to those disturbances, but also by the amount of wildfire. Existing levels of fire (shown in Figure 3-5), linked to severe fires that occurred from 2003 to 2012, resulted in a modeled decline in insect and disease activity in timesteps 1 and 2 (shown in Figure 3-6). Timesteps 3 through 5, however, show a steady increase in insects and disease, presumably due to the warmer, drier climatic conditions, species that are susceptible to insect and disease outbreaks (e.g., lodgepole pine), and substantial percentages of relatively dense, medium, large, and very large forest size classes (Figure 3-7 and Figure 3-8). These results suggest that given the Flathead National Forest's high proportion of large size classes, dense unburned stands combined with a warmer, drier climate will likely succumb to insects and disease. Previously, it was stated that since mean modeled levels of fire are less than what burned in 2003 through 2012, the model may be under-predicting fire and over-predicting insects and disease. Given the risk of insects and disease in stands that do not burn, the model suggests

that vast acres of medium, large, and very large size class forests will succumb regardless of whether fires occur at mean, maximum, or higher than maximum modeled levels.

Sections 3.3-3.5 summarize changes in vegetation as affected by disturbances (natural and human caused), which largely explain the changes in habitat for the wildlife species discussed in Section 3.6. The projected vegetation treatments resulting from the Spectrum model considered the lands suitable for timber production, vegetation desired condition, other multiple-use objectives, management requirements set forth in the National Forest Management Act, and budget limitations. The Spectrum model was run with a mix of objective functions, based on the theme of the alternative. Alternative A2 is the no-action alternative as modeled with SIMPPLLE, reflecting the existing 1986 forest plan. Alternative A2 is identified as alternative A in the Flathead National Forest draft EIS. Alternative A was run with an objective to maximize timber production, whereas Alternatives B and C had objectives to move towards vegetation desired condition as quickly as possible while meeting other resource objectives. Alternative D had an objective function to maximize timber and then to move towards vegetation desired condition.

3.3 Future Distribution of Size Classes

Figure 3-7 compares the current (decade 0) distribution of size classes between alternatives A and B through all five timesteps. The changes in size class are not very dramatic. Seedling-sapling and large-sized stands increase somewhat. Very large stands decrease slightly. Pole-sized stands increase substantially in decades 1 and 2 then decline substantially in decades 3, 4, and 5 following major disturbances.

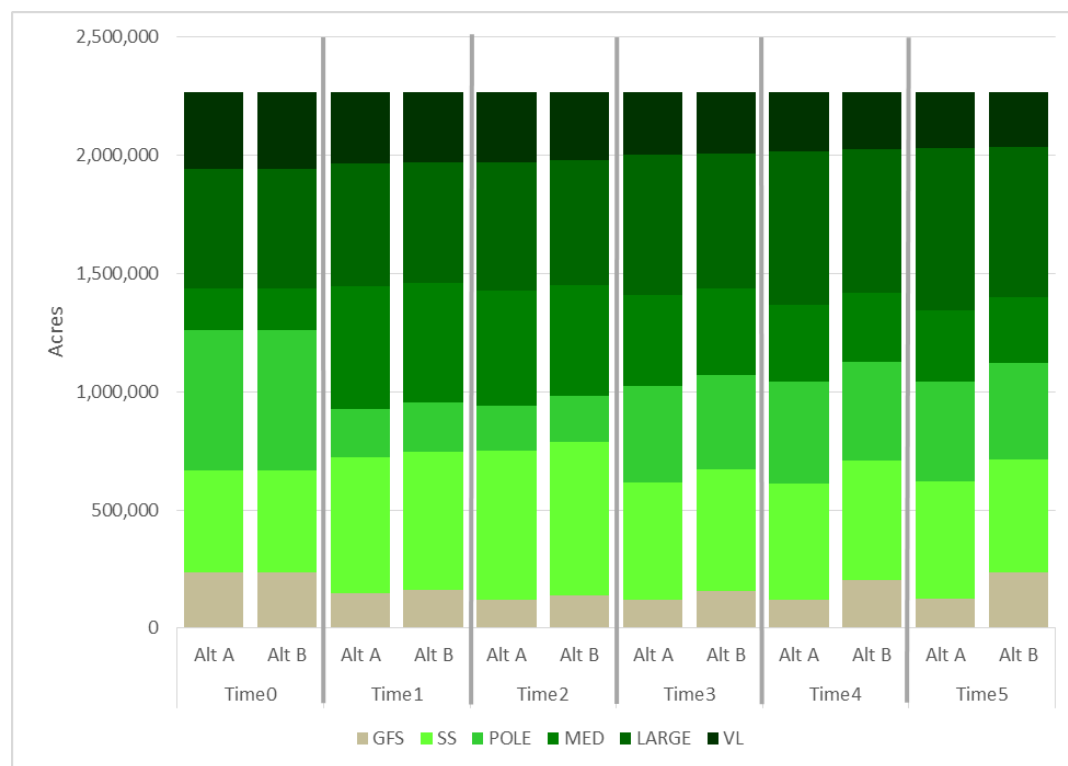


Figure 3-7. Current and modeled size class distribution for alternatives A and B.

GFS = grass/forb/shrub; SS = seedling-sapling (< 5" d.b.h.); POLE = pole (5-8.9" d.b.h.); MED = medium (9-14.9" d.b.h.); LARGE = large (15-20.9" d.b.h.); and VL = very large (>= 21" d.b.h.).

3.4 Future Distribution of Stand Densities

Changes in canopy closure for alternative A, conversely, are much more dramatic over the 5-decade period (Figure 3-8). Very dense stands (70-100 percent canopy closure) decline substantially through the period. Low-density, open stands (15-40 percent canopy closure) and moderately dense stands (40-70 percent canopy closure) increase substantially. These changes are consistent with substantial modeled increases in the amount of moderate-severity fire and insects and disease.

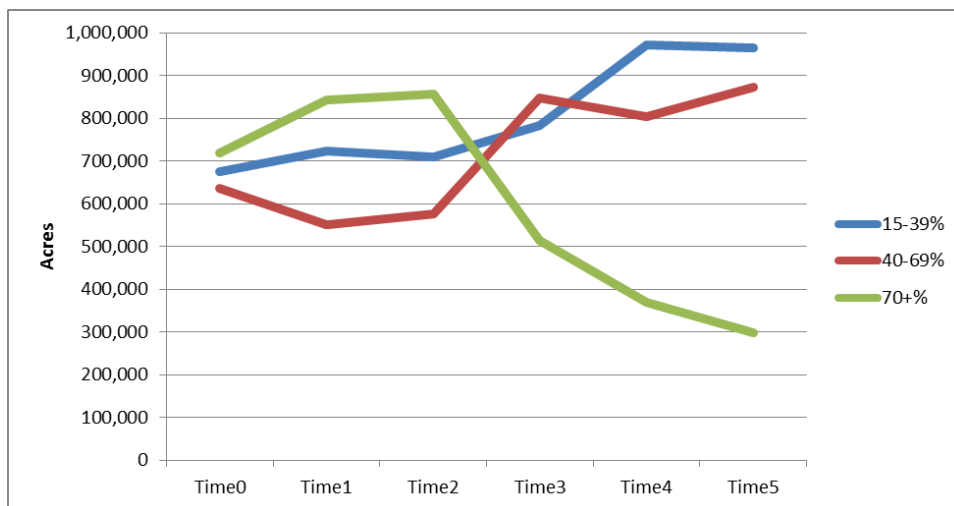


Figure 3-8. Current and modeled canopy density distribution for alternative A

3.5 Future Distribution of Cover Types

The aforementioned disturbances result in a slight modeled change in cover types for alternative A as illustrated in Figure 3-9. Disturbance-dependent species like larch and ponderosa pine increase slightly by timestep 5.

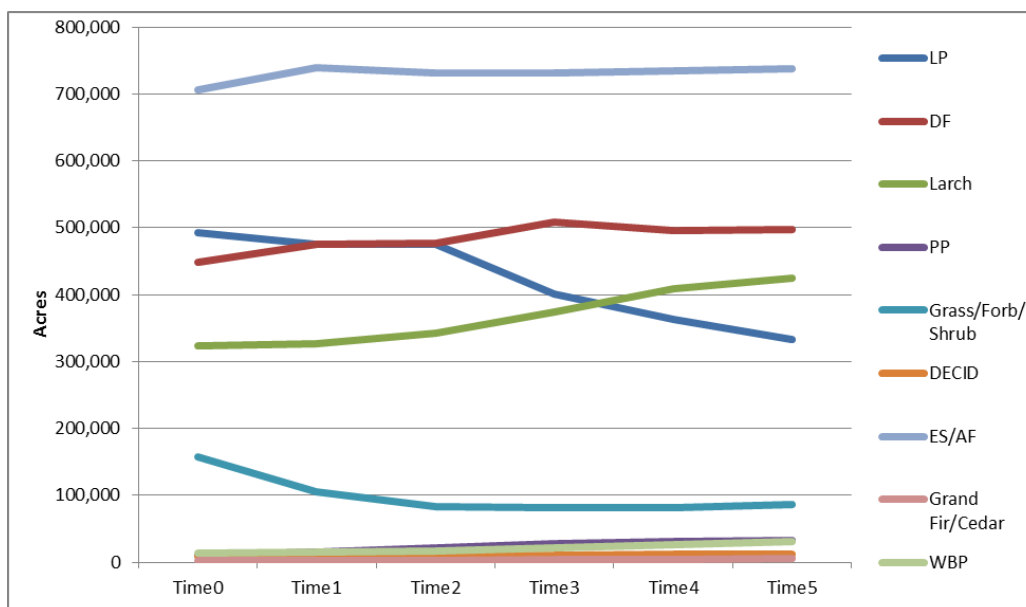


Figure 3-9. Current and modeled cover type distribution for alternative A.

LP = lodgepole pine; DF = Douglas-fir; Larch = western larch; PP = ponderosa pine; DECID = deciduous tree species (aspen, birch, and cottonwood); ES/AF = Engelmann spruce/subalpine fir; WBP = whitebark pine.

3.6 Wildlife Habitats

In this section, acres of modeled habitat by alternative and timestep are disclosed in a series of figures. In these figures, the average level of habitat is represented by a red diamond. The filled boxes represent the second and third quartiles of the habitat results from the 30 simulations by the five decadal timesteps. The black vertical lines extending above and below the filled boxes represent the range of maximum and minimum levels of habitat modeled over 30 simulations. The dashed red line shows the current (timestep 0) level of habitat. The dashed black lines show the maximum and minimum levels of modeled natural range of variation.

3.6.1 Caution When Comparing Current to Future Modeled Outcomes

Current levels of habitat (timestep 0) represent actual on-the-ground conditions that meet the query for a given species, recognizing the potential limitations of VMap data. Future levels of habitat in timesteps 1 through 5 represent modeled habitat based on a wide range of variables affecting tree growth and mortality from disturbances over time. Caution should be exercised when comparing current habitat at timestep 0 against modeled habitat at timestep 1 as this is an “apples to oranges” comparison. For instance, flammulated owl habitat shown in Figure 3-10 is currently at 15,000 acres. That acreage increases to 20,000 acres in timestep 1 and then maxes out at about 35,000 acres in timestep 3. The current level of habitat (15,000 acres) is an accurate estimate of existing habitat. The increasing level of modeled habitat from timestep 1 to 3 (20,000 acres to 35,000 acres) represents the modeled increase in habitat based on anticipated increases in fire, insects, disease, and vegetation management activities to move towards desired conditions. Although this curve represents a highly probable change in available habitat, the modeled starting point at timestep 1 (20,000 acres) may not be appreciably different from current levels of habitat (15,000 acres) at timestep 0. Therefore, the appropriate way to interpret these outcomes is to consider timestep 0 as the relative level of habitat within the 2.69 million-acre Forest. Levels of habitat in timesteps 1 through 5 reflect the trend over time. Comparisons to levels in timestep 0 to timestep 1 should be avoided.

3.6.2 Flammulated Owl

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-10. Acres of existing habitat are slightly higher than the minimum natural range of variation and increase to levels approximating the maximum natural range of variation in timesteps 3 through 5. The natural range of variation of modeled habitat for flammulated owls ranges from roughly 12,000-37,000 acres (a small range of about 25,000 acres) out of approximately 2.4 million acres on the Forest. In the future, acres of habitat increases from current levels during all 5 decades for all four alternatives. The model predicts all alternatives but C maintain habitat between minimum and maximum natural range of variation levels for the 5-decade time period. Alternative C exceeds the maximum natural range of variation by the end of decade 5. For alternatives B and D, acres of current habitat are slightly higher than the minimum natural range of variation and increase to levels approximating the maximum natural range of variation by the end of decade 5. Acres of current habitat increase by almost 200 percent by timestep 3.

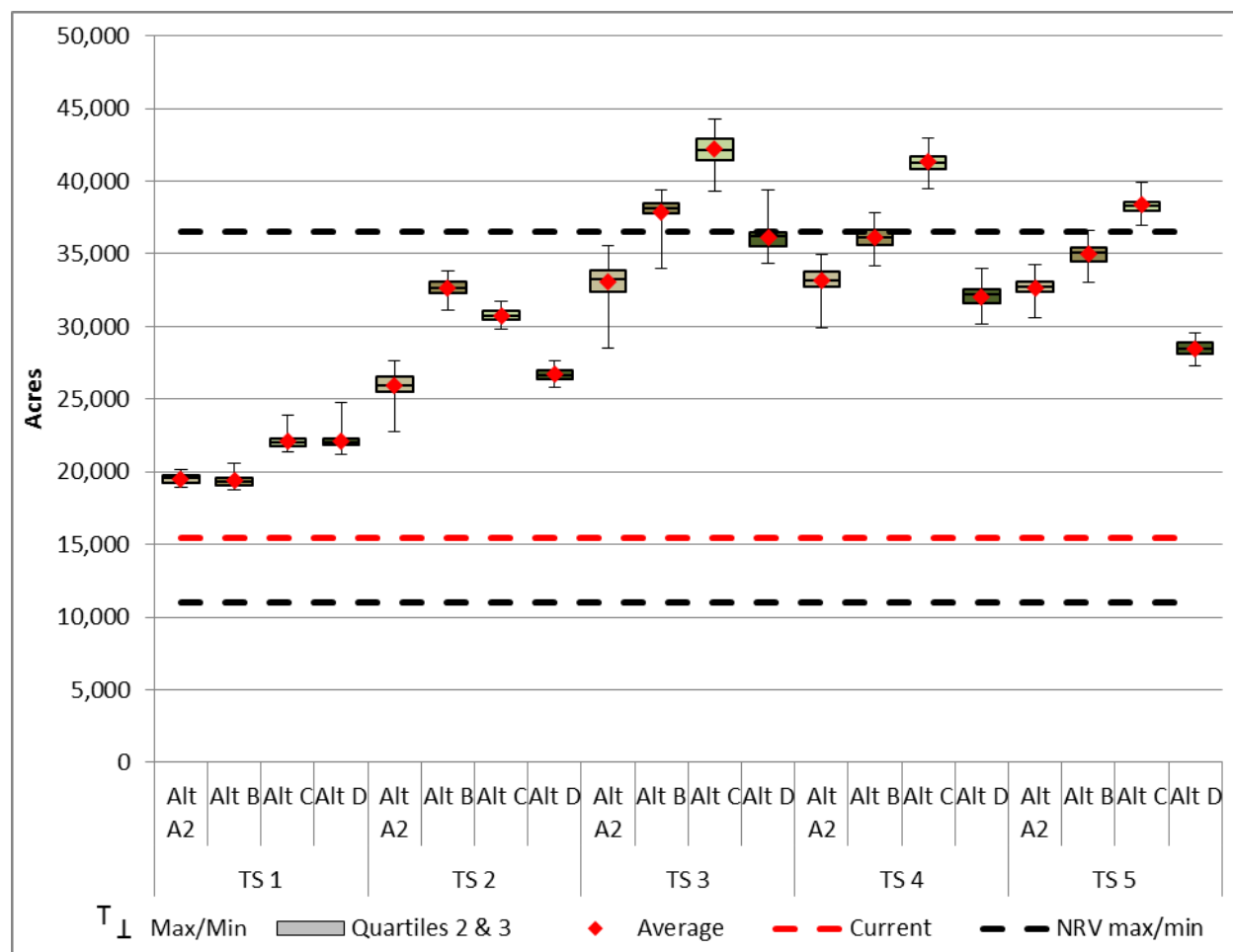


Figure 3-10. Current and modeled levels of flammulated owl habitat by alternative

Warm-dry and warm-moist habitat groups are uncommon on the Flathead National Forest compared to adjacent national forests (i.e., Lolo, Bitterroot, and Kootenai National Forests), which explains the limited acres of habitat at both minimum and maximum ranges. Furthermore, habitat within those limited habitat groups tends to be on the “moist end” of the dry moisture regime and often occur as smaller patches within the larger matrix of cool moist types, which means they typically burn naturally at mixed or high severities rather than at low severities like typical warm, dry habitats on adjacent forests. Thus, natural wildfires on the Forest are less likely to create and perpetuate forests of large or very large trees in an open, park-like structure with sparse understory trees when compared to adjacent forests.

In the past, dry ponderosa pine-dominated forests of the Forest were largely located in the valley bottom and lower foothills of the main Flathead River valley. Many were kept in a more open condition by frequent Native American burning. The Flathead River valley is largely in private ownership. By the mid to late 1800s, settlement and development of the valley by non-native Americans began, and wildfires were actively and effectively suppressed. Human disturbances, including Native American burning that was common historically and fuel treatments associated with wildland urban interface areas, often result in desired flammulated owl habitat consisting of large, open forest conditions.

Much of the Flathead National Forest flammulated owl habitat is located in areas that contain a large acreage of wildland urban interface. Because most flammulated owl habitat is at low elevations and in the

wildland urban interface, wildfires would be actively suppressed under all alternatives in most cases. Because flammulated owls prefer to nest in snags and feed in openings in less dense forests, it would be necessary to use timber harvest and prescribed burning as tools to achieve desired conditions.

Thus, the increases in flammulated owl habitat occurring with all alternatives in timesteps 2 through 5 may be attributable as much to vegetation treatments as natural disturbances. Alternative C increases flammulated owl habitat to levels slightly above the natural range of variation in timestep 3, likely as a result of climate changes as well as an increased level of prescribed burning to meet other resource objectives. Alternative A was modeled without prescribed burning because there is no objective for use of prescribed fire in the 1986 forest plan, which likely explains why it consistently produces less flammulated owl habitat through all timesteps. Alternative B produces the most flammulated owl habitat by timestep 2, likely as a result of modeled vegetation treatments that include timber harvest, pre-commercial thinning, and prescribed fire.

3.6.3 Fisher

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-11. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation over the 5-decade time period. There is a wide range of variation between maximum and minimum natural range of variation—about 350,000 acres. Acres of habitat increase somewhat above the current condition in timestep 1, likely due to forest succession outpacing fire, insects, disease, and vegetation management treatments. Then habitat declines and continues declining back to existing levels by timestep 5, similar to the steady decline in very large trees shown in Figure 3-7.

Much of this decrease is likely attributable to wildfire and/or the high amount of both Douglas-fir and spruce beetle portrayed in the model, both of which would cause widespread mortality of trees in the very large size classes. Climate is expected to be warmer and drier by decade 3, resulting in more insects and disease. Modeled declines are clearly a function of reduced live trees in the very large size classes and reduced canopy cover to levels below that which fishers require. Insect damage, disease, or fire produces snags and down woody material, which increase fisher habitat quality—provided that canopy cover offered by live trees does not decrease considerably. Alternative B declines a little more than the other alternatives because this alternative treats more acres through regeneration harvest during the first decade to reduce stand densities in the warm, moist biophysical setting and does more commercial thinning in later decades. This modeled outcome identifies acres of habitat with no consideration for distribution of minimum-sized areas across the landscape.

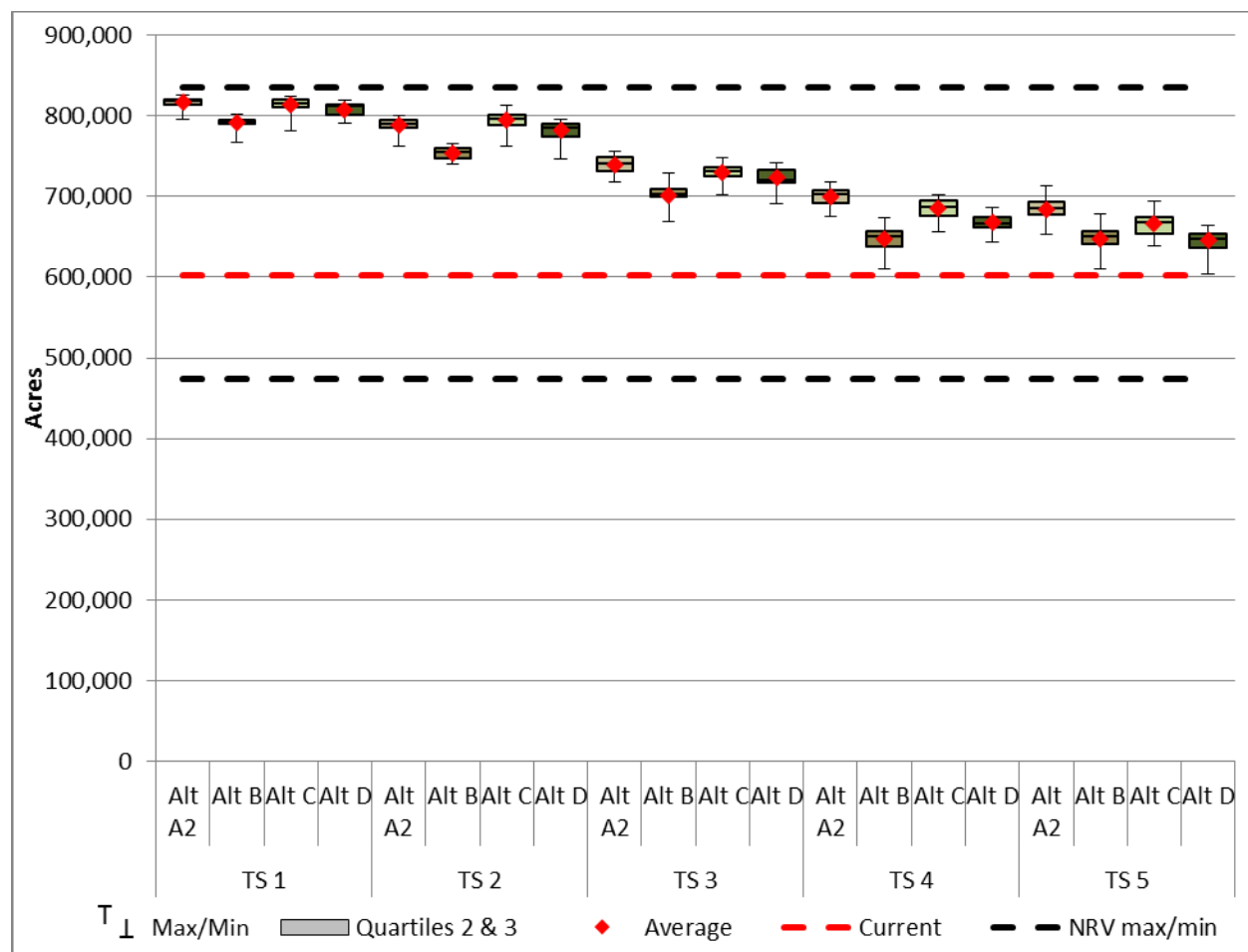


Figure 3-11. Current and modeled levels of fisher habitat by alternative

3.6.4 American Marten

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-12. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation over the 5-decade time period. There is a wide range of variation between maximum and minimum natural range of variation—about 650,000 acres. Acres of habitat increases in timestep 1, likely due to forest succession outpacing fire, insects, disease, and vegetation management treatments. Then acres of modeled habitat declines substantially, returning to near current levels at timestep 3, and continues declining through timestep 5—ending up around 25 percent below current levels. Acres of habitat are near the maximum natural range of variation in timesteps 1 and 2, then decrease sharply to just the midpoint between current and minimum natural range of variation in timesteps 4 and 5.

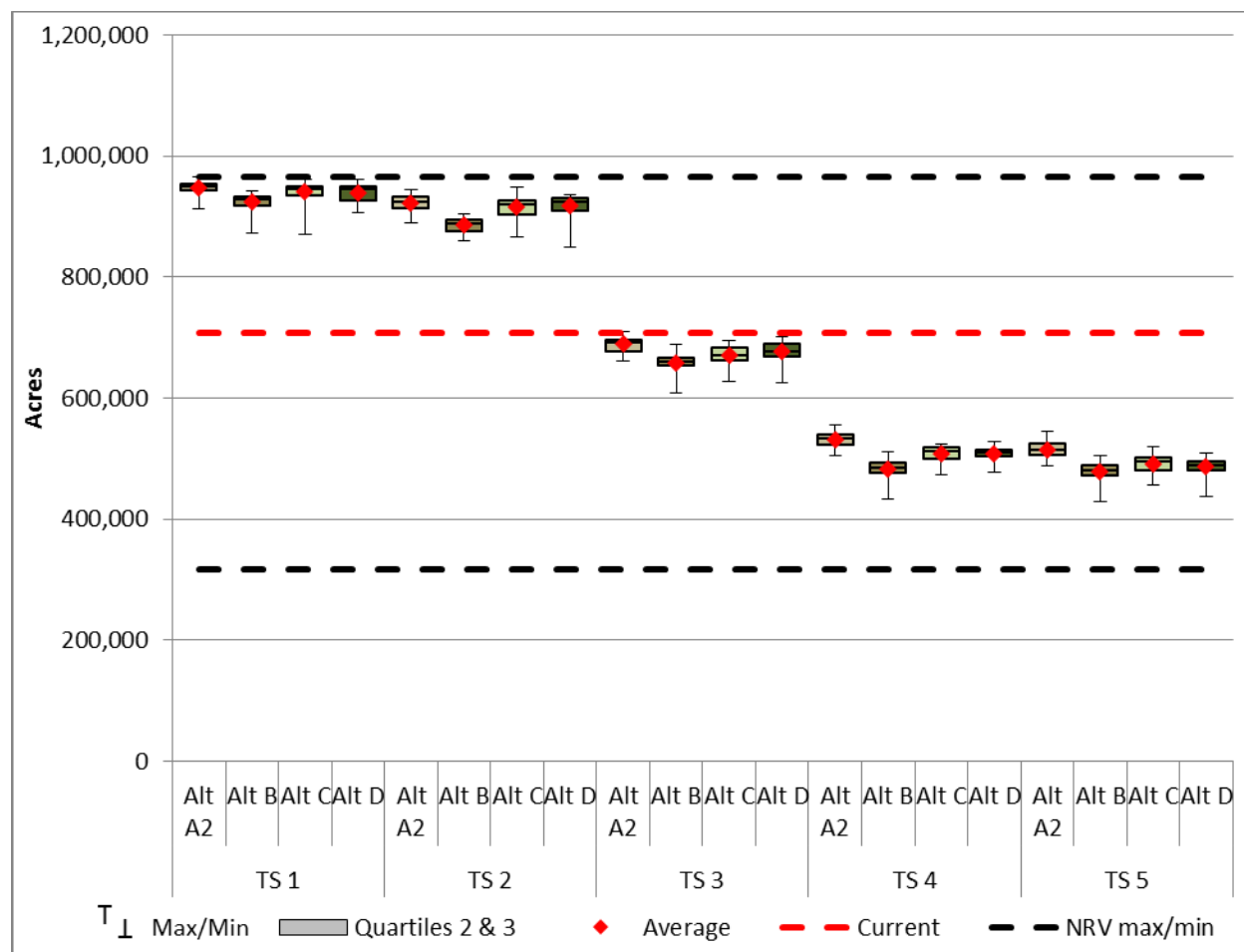


Figure 3-12. Current and modeled levels of American marten habitat by alternative

As for fishers, projected declines in marten habitat are clearly a function of modeled increases in fire, insects, and disease that either reduce the large and very large size classes that martens require or reduce the canopy closure to levels below that which martens require. The modeled decline in habitat is steeper than that for fishers. This is likely the result of martens occupying more upland habitats (including the cold potential vegetation group) than fisher. The model in this case is likely predicting that fires in upland habitats burn more acres at higher severities than lower-elevation mesic habitats. Additionally, because martens require denser stands than fishers (≥ 40 percent vs. ≥ 15 percent canopy closure), the combination of increased natural disturbance results in a substantial overall decline in modeled canopy closure (which reduces marten habitat quality and quantity), as illustrated in Figure 3-8. Alternative B declines a little more than the other alternatives because this alternative treats more acres (including use of prescribed fire) during the first decade to reduce stand densities in the warm, moist biophysical setting and does more commercial thinning in later decades to meet other resource objectives.

3.6.5 Canada Lynx Stand Initiation Habitat

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-13. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation over the 5-decade time period. There is a wide range of variation between maximum and minimum natural range of variation—about 180,000 acres. Existing habitat is slightly above the minimum natural range of variation, increases slightly in timesteps 1 and 2, declines in timestep 3, and then increases again in timesteps 4 and

5 to levels slightly above current levels by the 5th decade. Acres of habitat vary little between alternatives, with the greatest difference at 10 percent between alternatives B and C in timestep 5.

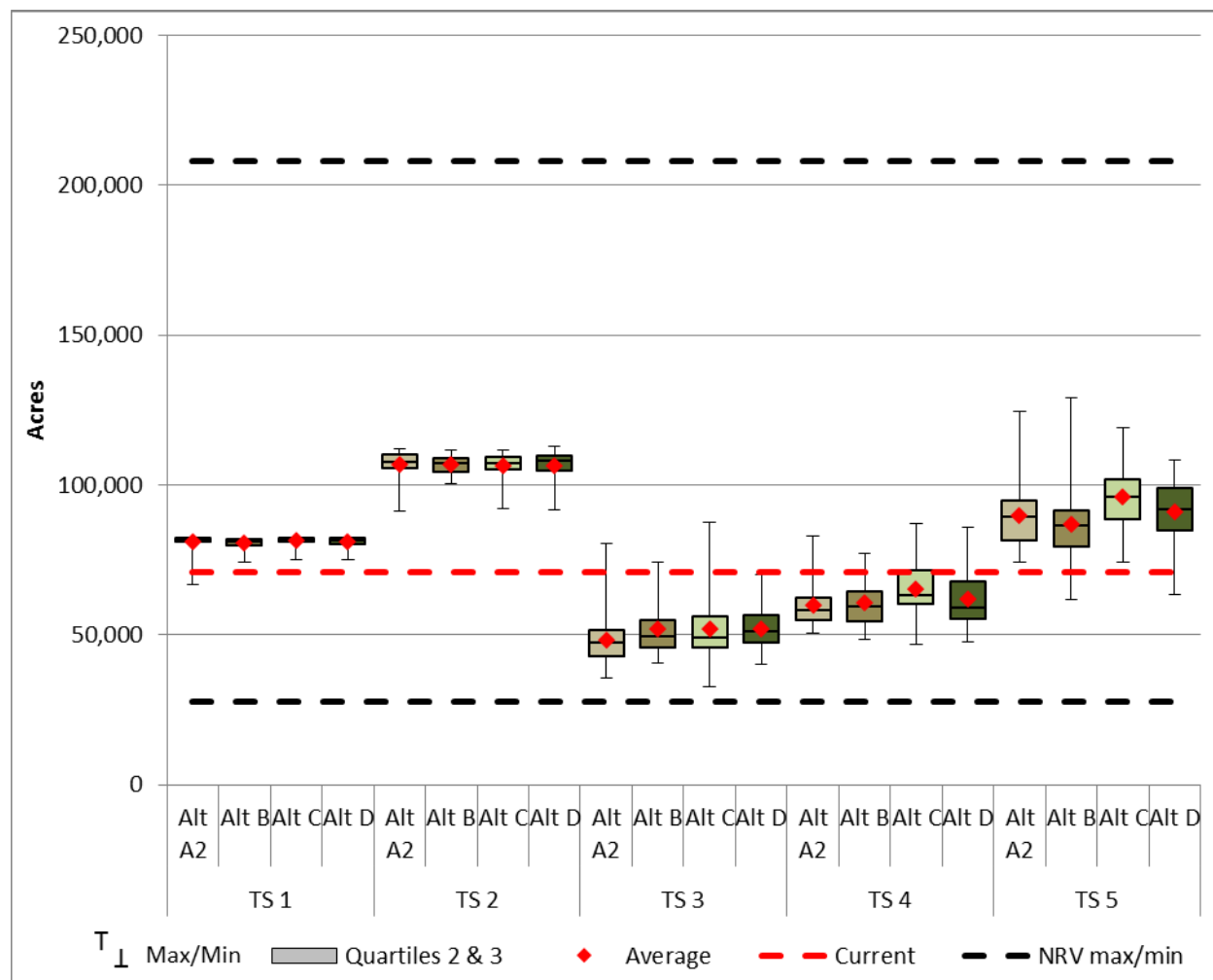


Figure 3-13. Current and modeled levels of Canada lynx stand initiation habitat by alternative

Stand initiation habitat occurs in a narrow “window” following major disturbances (stand-replacing fire, regeneration timber harvest, etc.) that typically begins once dense small trees and shrubs have regenerated (about 20 years after the disturbance on average) but may only last another decade or two until trees reach a stem exclusion condition. That is why the maximum range of the natural range of variation (about 225,000 acres) with naturally occurring fires (without fire suppression) is only about 9 percent of all Forest acres. On forests like the Flathead National Forest, where conifer growth is rapid in the moist habitats providing lynx habitat, if consistent levels of disturbance that re-initiate young forests are lacking, acres of stand initiation habitat will go up and down. Modeled acres of habitat by alternative represent only about half of the maximum natural range of variation. All alternatives were modeled with fire suppression logic, which explains why modeled habitat is at the lower range of natural range of variation. Stand initiation habitat at levels approaching maximum natural range of variation would only occur if fires are not suppressed on most of lynx habitat. Furthermore, since all alternatives contain varying levels of regeneration timber harvest, it is clear that those levels of regeneration timber harvest do not replace the acres of disturbance that would have occurred naturally without fire suppression.

3.6.6 Natural Range of Variation for Canada Lynx Habitat in Unsuitable Habitat

Historically, fire, insects, and disease were the primary processes that affected forest vegetation in lynx habitat, reverting them to an early stage of succession or creating openings within the forest canopy. The Northern Rockies Lynx Management Direction (2007) defines lynx habitat in an unsuitable condition as lynx habitat in the stand initiation structural stage where trees are generally less than 10 to 30 years old (e.g., current burned forest less than 20 years old) and have not grown tall enough to protrude above the snow in winter. As a result, these forests are too small or too open to provide dense, seedling-sapling winter forage for snowshoe hares, but trees will become taller and denser as forests go through vegetative succession. The SIMPPLLE model was used to model the levels of lynx habitat in an unsuitable condition in natural range of variation. The model estimated that at a maximum level, 13.8 percent of Forest lynx analysis units would have had more than 30 percent of the lynx habitat in a lynx analysis unit in an unsuitable condition. At a minimum level, 4.0 percent of lynx analysis units would have had more than 30 percent of lynx habitat in an unsuitable condition, and at a mean level, 8.6 percent of lynx analysis units would have had more than 30 percent of the lynx habitat in an unsuitable condition. Northern Rockies Lynx Management Direction standard VEG S1 suggests that levels of unsuitable habitat greater than 30 percent at the lynx analysis unit scale are undesirable for lynx and should be avoided. This analysis, however, illustrates that due to periodic large, stand-replacing fires and insect and disease outbreaks, some large expanses of unsuitable habitat are inevitable and will exceed the 30 percent standard on a small percentage of lynx analysis units. The following figure (Figure 3-14) presents the natural range of variation going back about 1,000 years for maximum, minimum, and average levels of lynx habitat in an unsuitable condition in the Flathead's lynx analysis units and compares that to current levels.

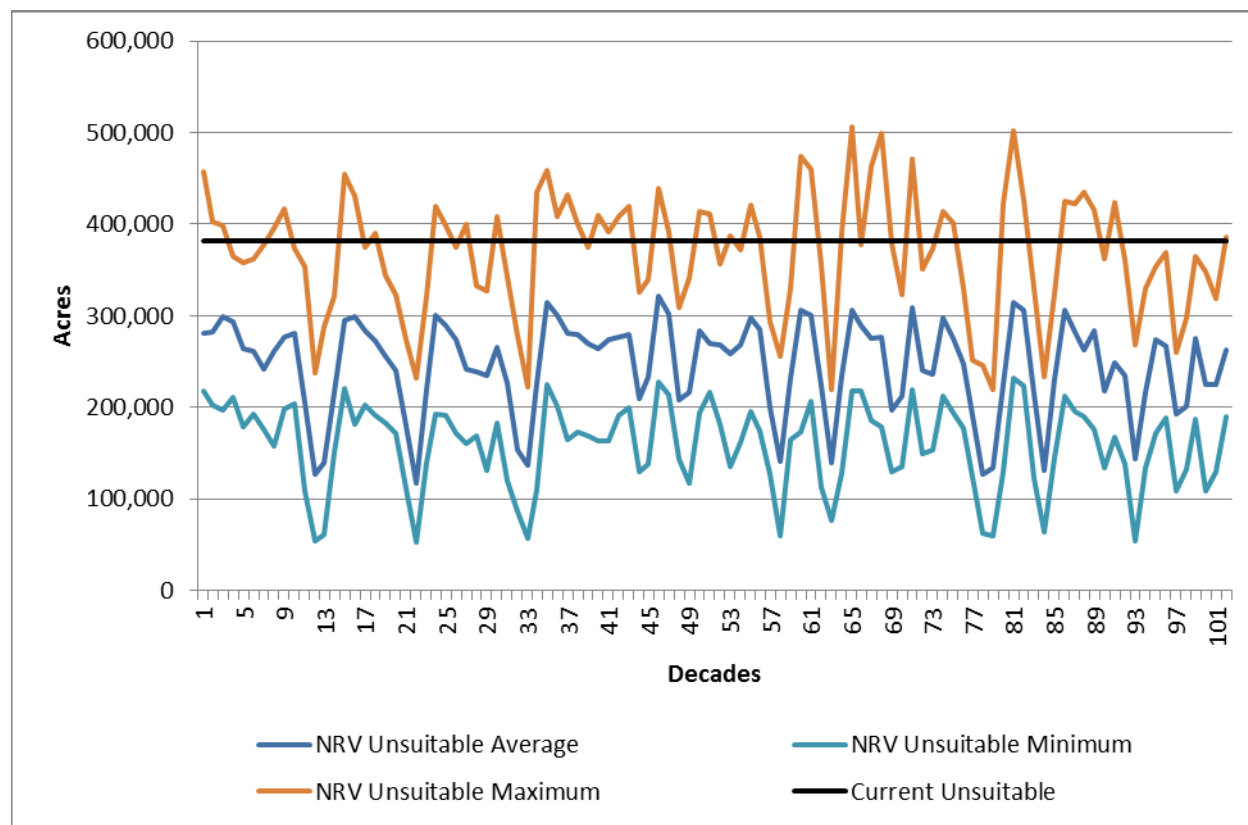


Figure 3-14 Average, maximum, and minimum levels of lynx unsuitable habitat across 102 decades within natural range of variation (NRV) and current levels

3.6.7 Canada Lynx Multistoried Habitat

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-15. The model predicts that multistoried habitat would initially increase to levels slightly above natural range of variation and then decline to levels that hover around the midpoint of the current and minimum natural range of variation. The range between maximum and minimum natural range of variation is very large, almost 650,000 acres. There is uncertainty in the model results because although the model estimates canopy cover and canopy layers over time, it cannot discern whether there is a dense enough understory to provide winter snowshoe hare and lynx habitat. What the model depicts is the trend in forest stands that are most likely to have a multistoried structure, high canopy closure, and presence of subalpine fir and spruce.

Acres of current habitat at timestep 0 are above the midpoint of natural range of variation. Modeled levels of habitat are slightly above the maximum natural range of variation in timesteps 1 and 2. Habitat declines in timestep 3 back to current levels and then declines further in timesteps 4 and 5 to levels above the minimum natural range of variation.

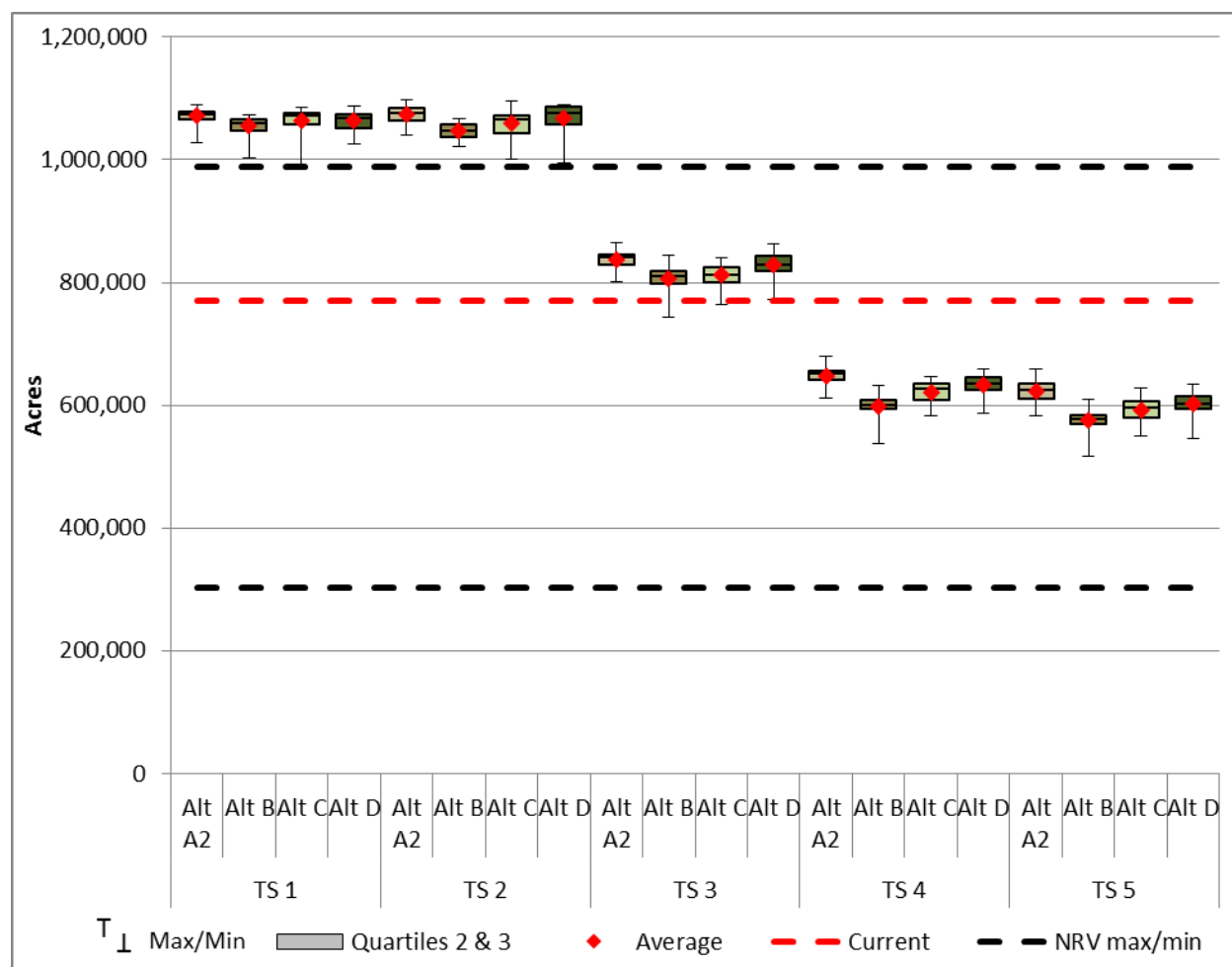


Figure 3-15. Current and modeled levels of Canada lynx multistoried habitat by alternative

Since the model reduces harvest based upon lynx standard VEG S6 and applies fire suppression logic as well as forest succession for all alternatives, levels of modeled habitat slightly exceed the maximum range of natural range of variation at timesteps 1 and 2. Like habitat for fisher and marten, modeled declines in

lynx multistoried habitat in timestep 3 are clearly a function of substantial modeled increases in natural disturbances that either reduce the multistoried, large and very large size classes that lynx require or reduce the canopy closure to levels below that which lynx require by the end of the 5th decade.

Despite forest plan components to maintain or increase multistoried hare and lynx habitat, modeled declines of about 200,000 acres below current levels are projected to occur at the end of five decades, regardless of alternative. This suggests that the current level of modeled multistoried habitat may be unsustainable based on inevitable and unavoidable natural disturbances, which are projected to increase with a warmer, drier summer climate. These disturbances would return levels to within the modeled maximum natural range of variation. If insects/disease kill scattered patches of trees in the overstory of multistoried forests, it could increase the density of the understory, creating multistoried stands after a lag time of a few decades provided the loss of canopy cover is not too great. In contrast, stand-replacing wildfires would create more stand initiation habitat after a lag time of a few decades. According to modeling of natural range of variation, fire cycles affecting the amount of multistoried and stand initiation habitat have probably occurred in the past and are likely to occur in the future in the mid- to high-elevation subalpine fir and spruce forests of the Flathead National Forest. Much still needs to be learned with respect to lynx response to wildfire over long periods of time, but lynx have persisted in the northern Rocky Mountains with these fluctuations in historic levels of fire, insects, and disease.

3.6.8 Black-backed Woodpecker

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-16. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation over the 5-decade time period. The range between maximum and minimum levels of habitat is relatively large, which parallels the maximum levels of modeled fire thorough the period. This is not surprising since the black-backed woodpecker is a fire-dependent species. The natural range of variation of modeled habitat for black-backed woodpeckers ranges from about 10,000 to 270,000 acres out of approximately 2.4 million acres on the Forest, a moderate range of about 260,000 acres. In the future, acres of habitat increases somewhat then declines back to current levels by decade five.

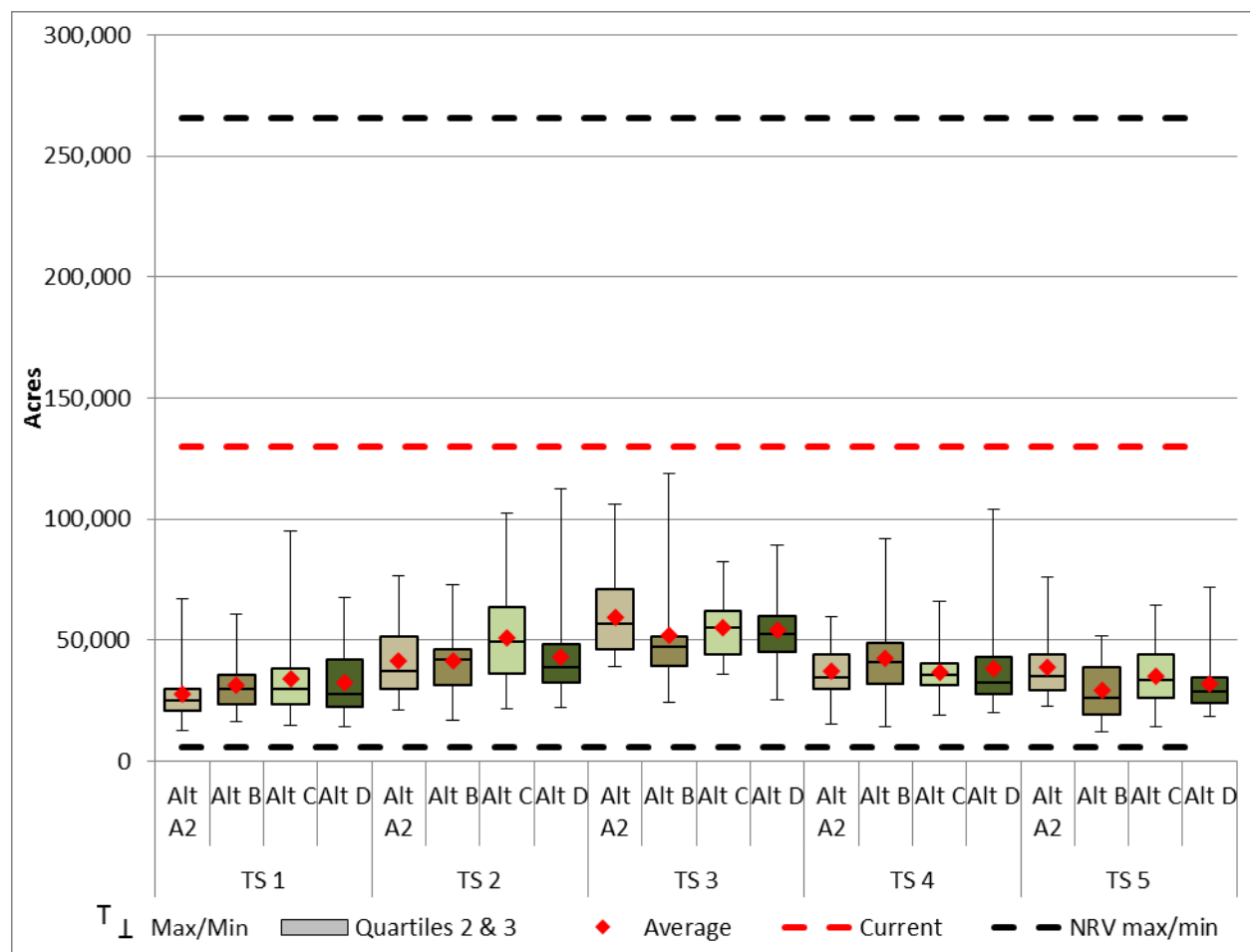


Figure 3-16. Current and modeled levels of black-backed woodpecker habitat by alternative

The current level of high-quality black-backed woodpecker habitat is the result of the large acreage burned with stand-replacing wildfires on the Forest in the last decade, but this habitat only lasts up to a decade. All alternatives were modeled with fire suppression logic for timesteps 1-5. Thus, even though the mean acres of black-backed woodpecker habitat increases from about 25,000 acres up to 60,000 acres through the 5-decade period, that level of habitat never approaches the maximum range of natural range of variation or even the acres burned in the 2003-2012 period that provided existing post-burn habitat. Clearly, the modeled fire suppression logic of the model is the single factor responsible for the relatively low level of black-backed woodpecker habitat resulting from stand-replacing wildfires in the 10-inch+ d.b.h. size class on the Forest.

Black-backed woodpeckers readily cross forest boundaries to exploit faraway burns (Hoyt, 2000). Fires have been active on adjacent forests in the last two decades, despite continued fire suppression. Consequently, black-backed woodpeckers are not at risk on the Flathead National Forest or in other adjacent forests in the Northern Region (Samson, 2006a), despite continuing fire suppression. In addition, although forests with insect and disease infestation do not provide the high-quality habitat that areas with stand-replacing fires do, these acres are likely to increase after timestep 2 and would sustain black-backed woodpecker populations at lower densities.

3.6.9 Olive-sided Flycatcher

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-17. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation over the 5-decade time period. Acres of habitat vary little between alternatives. The range between maximum and minimum levels of habitat is relatively large and parallels the maximum levels of modeled fire through the 5-decadal period, which is not surprising since this is a fire-dependent species. The natural range of variation of modeled habitat ranges from about 450,000 to 1.3 million acres out of approximately 2.4 million acres on the Flathead National Forest, a large range of about 850,000 acres. In the future, acres of habitat increase continuously through decade 5. There are minor differences in alternatives because wildfire, prescribed fire, commercial thinning, and timber harvest can all create the habitat conditions this species requires.

Because olive-sided flycatchers are edge-dependent, disturbances that create edges, including moderate- and high-severity fires, insects and disease, can all contribute to olive-sided flycatcher habitat as long as sufficient mature forest remains following those disturbances. Consequently, even considering some uncertainty in the degree to which forests burn vs. succumb to insects and disease, modeled habitat for olive-sided flycatchers is abundant on the Forest.

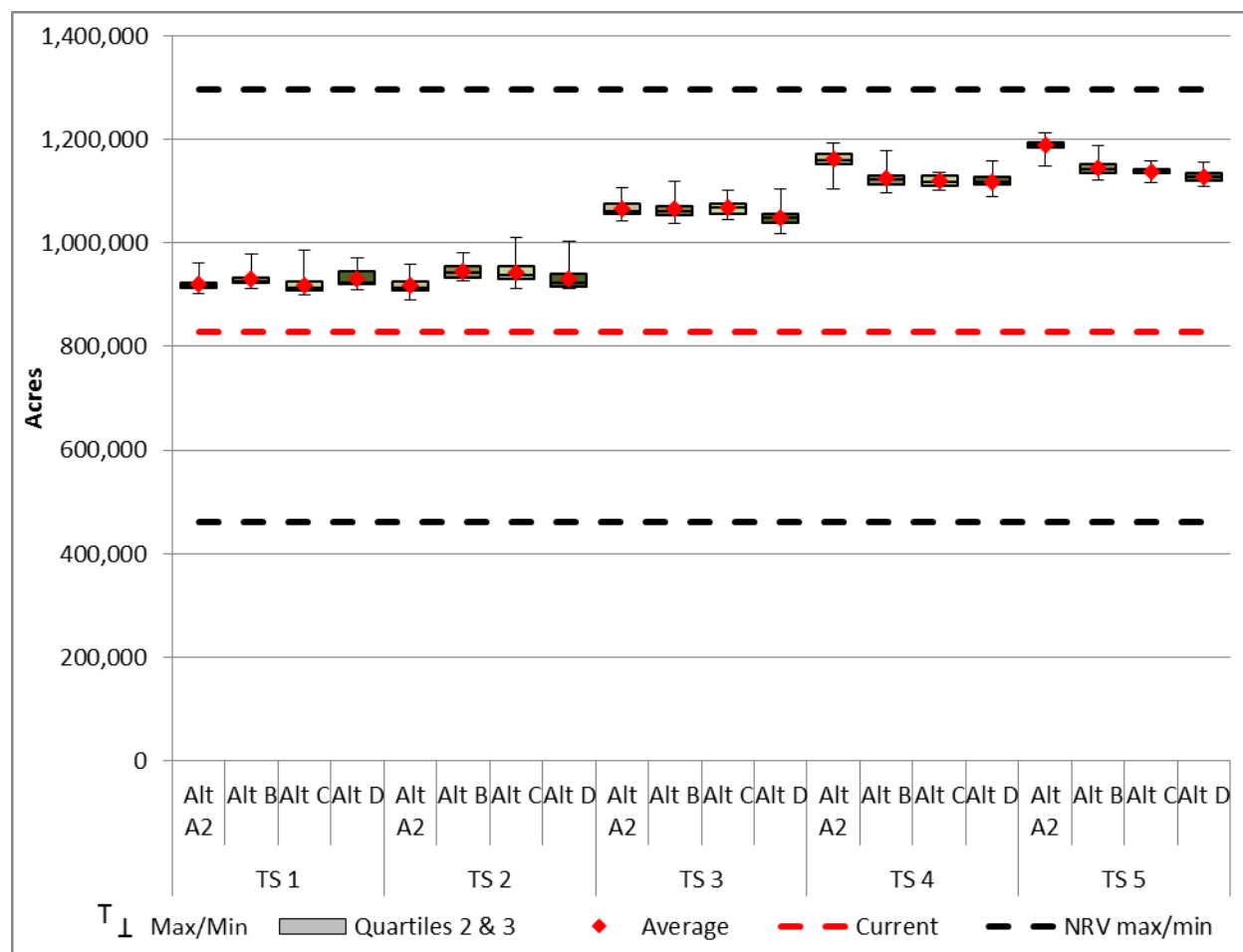


Figure 3-17. Current and modeled levels of olive-sided flycatcher habitat by alternative

3.6.10 Pileated Woodpecker

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-18. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation over the 5-decade time period. Future acres of modeled habitat vary little between alternatives and remain close to current levels, which are at the middle of the range of natural range of variation. Acres of habitat increase slightly and consistently through decade 5.

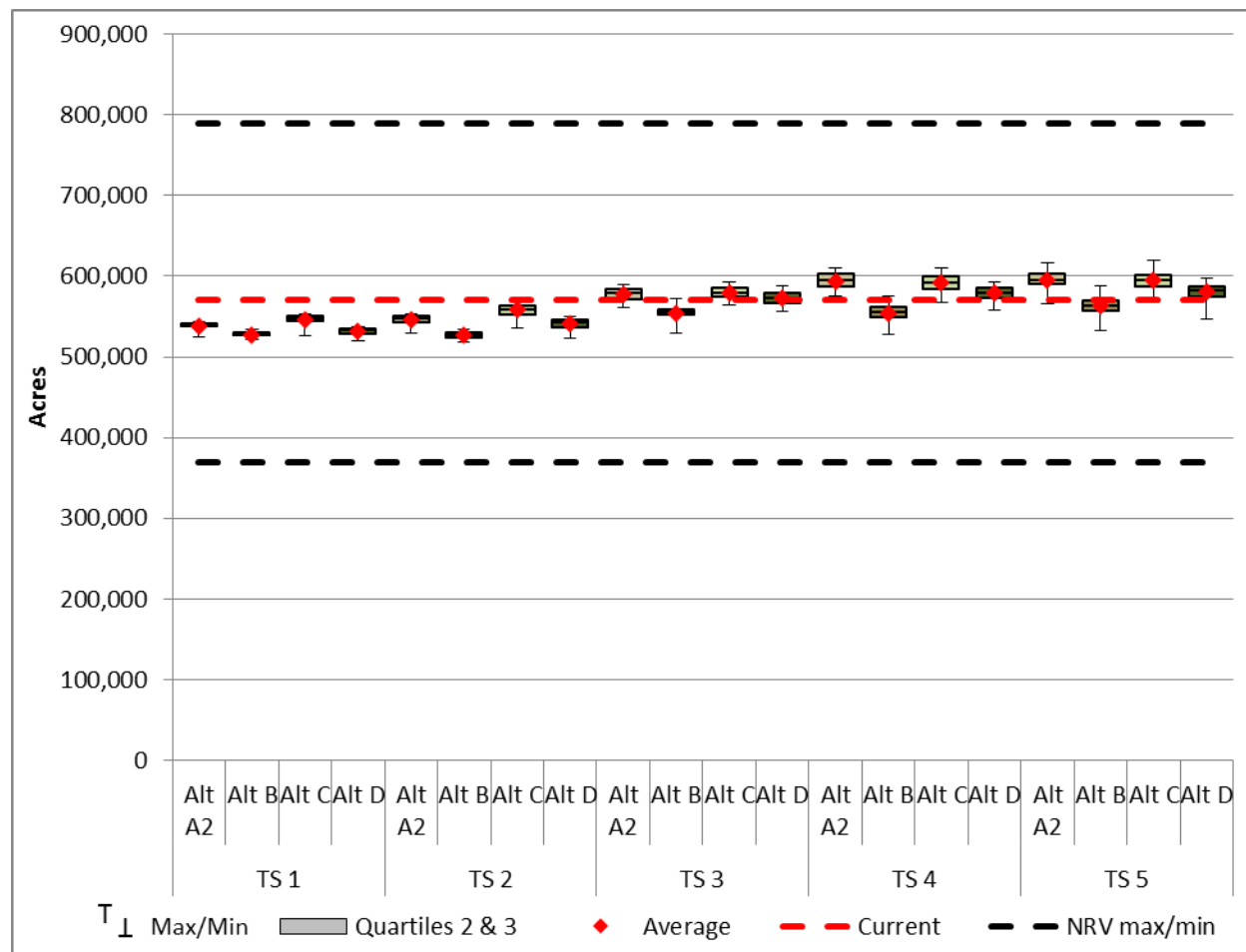


Figure 3-18. Current and modeled levels of pileated woodpecker habitat by alternative

Since pileated woodpeckers utilize forests that are relatively open (greater than or equal to 15 percent canopy closure), moderate-severity fires, insects, and disease have little negative effect as long as stands retain large trees and also contain a few very large trees for nesting and feeding. The combined modeled acreage of large and very large trees increases slightly through the 5-decade period (Figure 3-7) and parallels the slight modeled increase in pileated habitat through the same period, which explains the outcome. Changes in the distribution of cover types for suitable nest trees, which include western larch, ponderosa pine, Douglas-fir, and western redcedar, suggest those preferred nest trees will also increase slightly through the period (Figure 3-9). These multiple modeled variables all suggest that habitat for pileated woodpeckers will increase through the 5-decade period regardless of alternative selected.

The pileated woodpecker query design did not include the availability of nest snags or foraging habitat based on insect availability. The amount of modeled fire, insects, and disease, however, will further

contribute to both nesting snags and foraging snags that would increase habitat quality by the end of decade 5.

Since pileated woodpeckers are snag dependent and because remotely sensed data do not detect snags, Forest Inventory and Analysis data were reviewed to determine if snags occurred at sufficient densities within SIMPPLLE-modeled habitat to provide both nesting and foraging opportunities. Forest Inventory and Analysis summary data (Trechsel, 2016) suggests snags 15-20 inches d.b.h. (used primarily for feeding) occur at approximately four per acre and snags > 20 inches d.b.h. (used primarily for nesting) occur at approximately one per acre. These densities suggest snags are not limiting pileated woodpeckers on the Flathead National Forest.

3.6.11 Moose Forage

The natural range of variation ranges from about 190,000 to 900,000 acres out of approximately 2.4 million acres on the Forest, a very large range of about 710,000 acres. Acres of modeled habitat vary somewhat between alternatives (Figure 3-19). The model predicts acres of habitat will increase slightly at timesteps 1 and 2, then decline to current levels in timesteps 3 through 5. Acres of habitat are approximately at the midpoint between the maximum and minimum natural range of variation in all time timesteps.

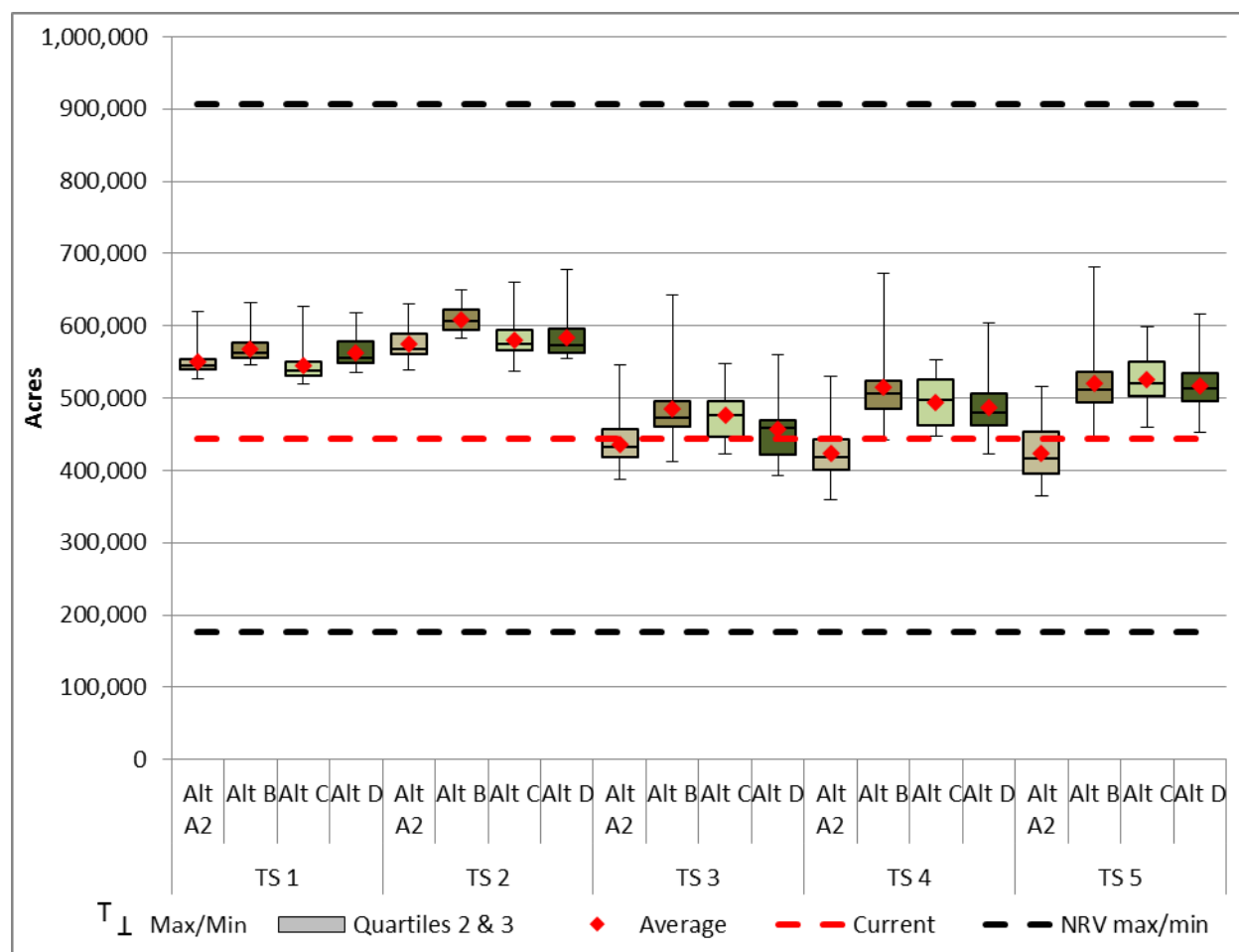


Figure 3-19. Current and modeled levels of moose habitat by alternative

Increased levels of habitat in decades 1 and 2 are clearly the result of increased disturbance from wildfires in the last decade as well as from management activities. Since moose habitat is a mesic subset of elk habitat and mesic sites generally produce substantial levels of grass, forbs, and shrubs after any reduction in canopy, it may not matter much whether that loss in canopy occurs from fire, insects, disease, or vegetation management. Consequently, it is likely that moose habitat will stay at or above current levels and towards the midpoint of natural range of variation, assuming modeled increases in disturbances are highly probable. Alternative A is slightly lower than the other alternatives because that alternative does not include any prescribed burning.

3.6.12 Elk Forage

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-20. The natural range of variation of habitat for elk ranges from about 290,000 to 1,100,000 acres out of approximately 2.4 million acres on the Forest, a large range of about 720,000 acres. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation, hovering somewhere around the midpoint and current levels. Acres of habitat increase slightly in timesteps 1 and 2, then decline back to current levels in timesteps 3 through 5. In the future, acres of modeled habitat vary somewhat between alternatives, with alternatives B and C slightly outperforming other alternatives, likely due to higher amounts of prescribed burning to meet multiple resource objectives. Alternative A is consistently outperformed by the other alternatives, which is most likely attributable to the lack of prescribed fire in alternative A. With alternative D, desired conditions would primarily be achieved by timber harvest that may be followed by prescribed burning.

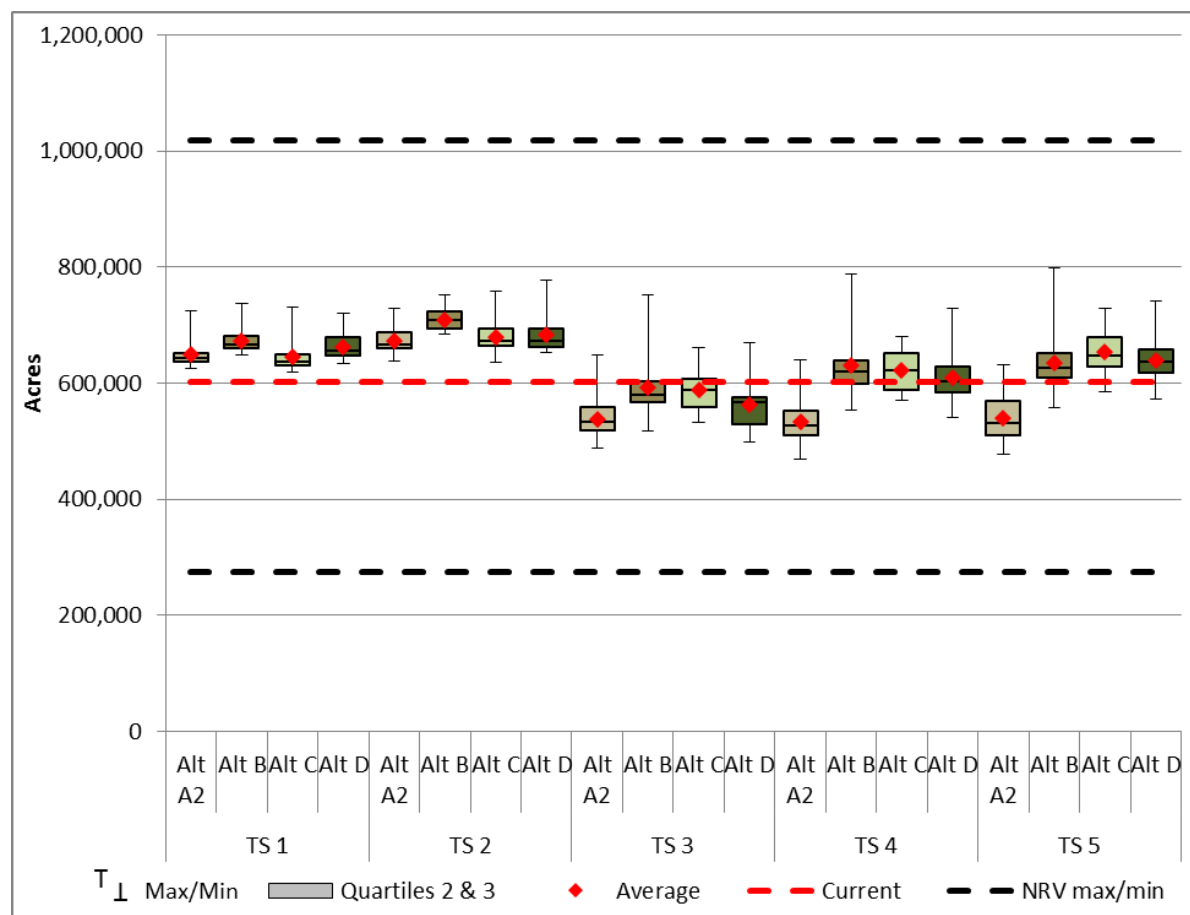


Figure 3-20. Current and modeled levels of elk summer forage habitat by alternative

Acres of habitat increase slightly at timesteps 1 and 2, then decline back to current levels in timesteps 3 through 5. Acres of habitat are within the natural range of variation for all timesteps, with a modest decline in timesteps 3 and 4. The range of maximum and minimum habitat is substantial and, similar to black-backed woodpecker habitat, reflects the uncertainty with modeled acres of fire.

3.6.13 White-tailed Deer Winter Habitat

White-tailed deer winter range acres of modeled habitat by alternative and timestep are disclosed in Figure 3-21. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation over the 5-decade time period. The natural range of variation for snow-intercept cover in areas mapped as white-tailed deer winter range ranged from about 29,518 to 110,721 acres out of approximately 325,491 acres of winter habitat on the Forest—a moderate range of about 81,203 acres. The current level of habitat is estimated to be at the midpoint of natural range of variation at approximately 72,000 acres. Acres of habitat increase somewhat at timesteps 1 and 2, then decline substantially from timesteps 3 through 5. Acres of habitat are close to maximum natural range of variation in timesteps 1 and 2, decline to a midpoint between minimum and maximum natural range of variation in timestep 3, and then drop closer to minimum natural range of variation in timesteps 4 and 5.

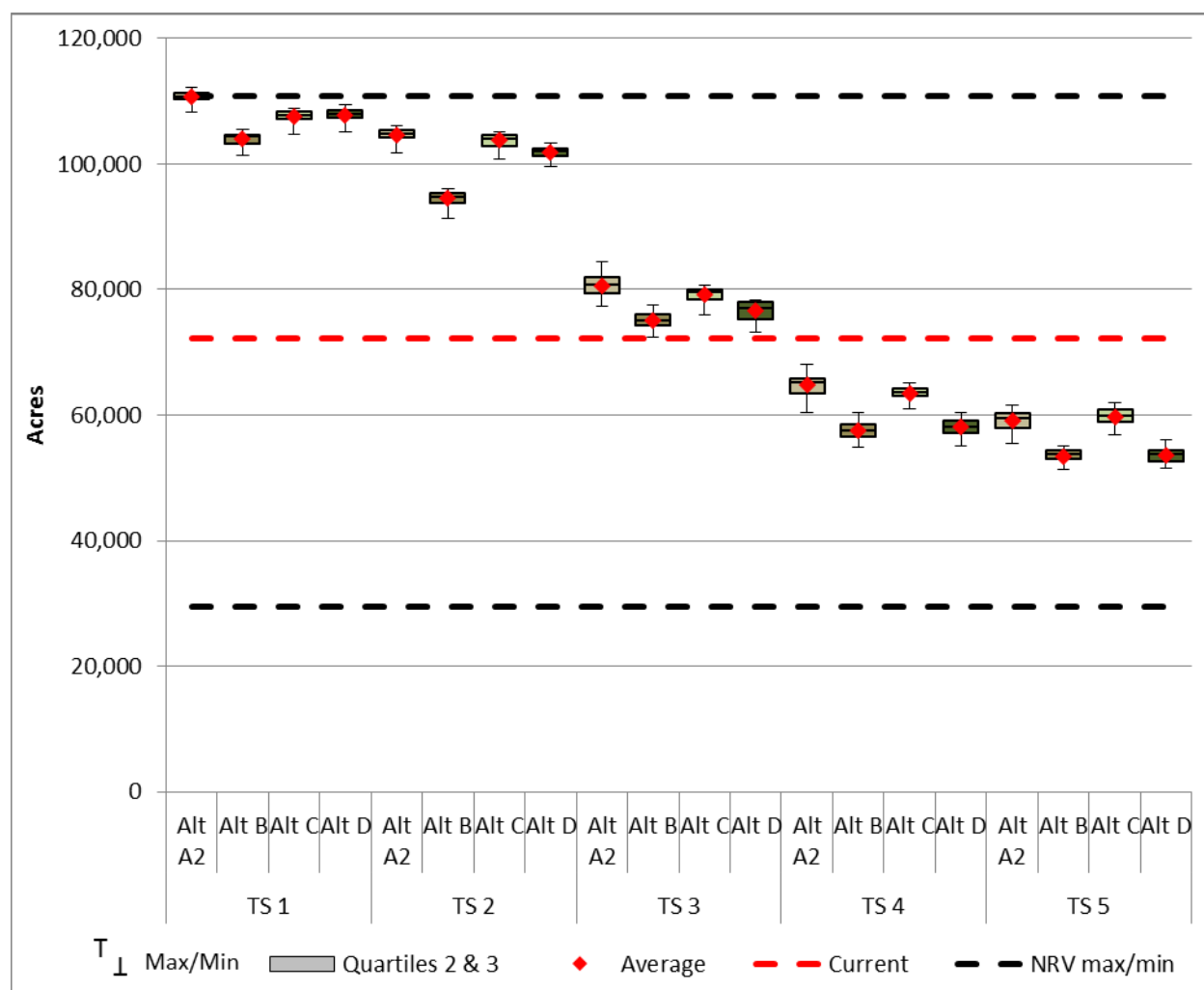


Figure 3-21. Current and modeled levels of white tailed deer habitat by alternative

Modeled habitat increases in the first and second decades, likely due to forest succession outpacing timber harvest, insects, disease, and wildfire. All alternatives decline to a level about 20,000 acres below current by decades 4 and 5, consistent with modeled increases in wildfire, insects, and disease, which reduces canopy cover in some areas to the point that snow interception is no longer provided. Alternatives B and D provide slightly less snow-intercept cover than A or C, likely due to vegetation treatments to meet other resource objectives in the warm-dry and warm-moist biophysical settings where the majority of the Forest's white-tailed deer winter habitat is located.

The steep modeled decline is clearly the result of increased disturbance and parallels similar declines in fisher, marten, and lynx multistoried habitat. This change could be attributed to fire, insects, or disease since any of those disturbances would result in reduced canopy closure. Also, because of the increase in modeled disturbances, the decline in white-tailed winter range habitat is likely inevitable and unavoidable despite current fire suppression efforts. In the warm-moist biophysical setting, the moderate and high forest density class is currently a very high proportion of the total as a result of fire suppression. Vegetation modeling for the Forest shows that over the next 50 years all alternatives would show a strong decrease in Douglas-fir and forest stand densities.

Winter climatic conditions have changed dramatically since the late 1970s and early 1980s when research suggested dense crown closure was essential for winter white-tailed deer survival. The current pattern of winter weather seldom results in the prolonged combination deep snow and severe cold that characterized conditions from the late 1970s. Consequently, it's unlikely that white-tailed deer populations will actually parallel the modeled decline in habitat; populations may actually remain stable or increase. With all alternatives, white-tailed deer are likely to do well during most winters, but the lack of snow interception provided by a canopy of full-crowned mature trees could cause higher levels of mortality due to predation during harsh winters.

3.6.14 Habitat Connectivity

Levels of cover (stands greater than 5 inches d.b.h. and greater than 40 percent canopy closure), and levels of dense, mature forest (marten habitat) were modeled within the American Wildlands-designated (American Wildlands, 2008) polygons (Figure 1-2) to represent changes by alternative by timestep within areas important for habitat connectivity. Those polygons represent 1.16 million acres. Additionally, changes in mean patch size were modeled to show how treatment and natural disturbances might affect the size of those patches over time.

Levels of dense, mature forest (marten habitat) within the aforementioned connectivity areas (National Forest System lands only) are disclosed in Figure 3-22 by alternative and timestep. Levels of existing dense, mature forest within those connectivity areas are displayed by the dashed red line. The mean level of habitat is represented by the boxes on the black vertical lines. Habitat declines by about 75,000 acres through timesteps 3 through 5 but with little difference evident between alternatives.

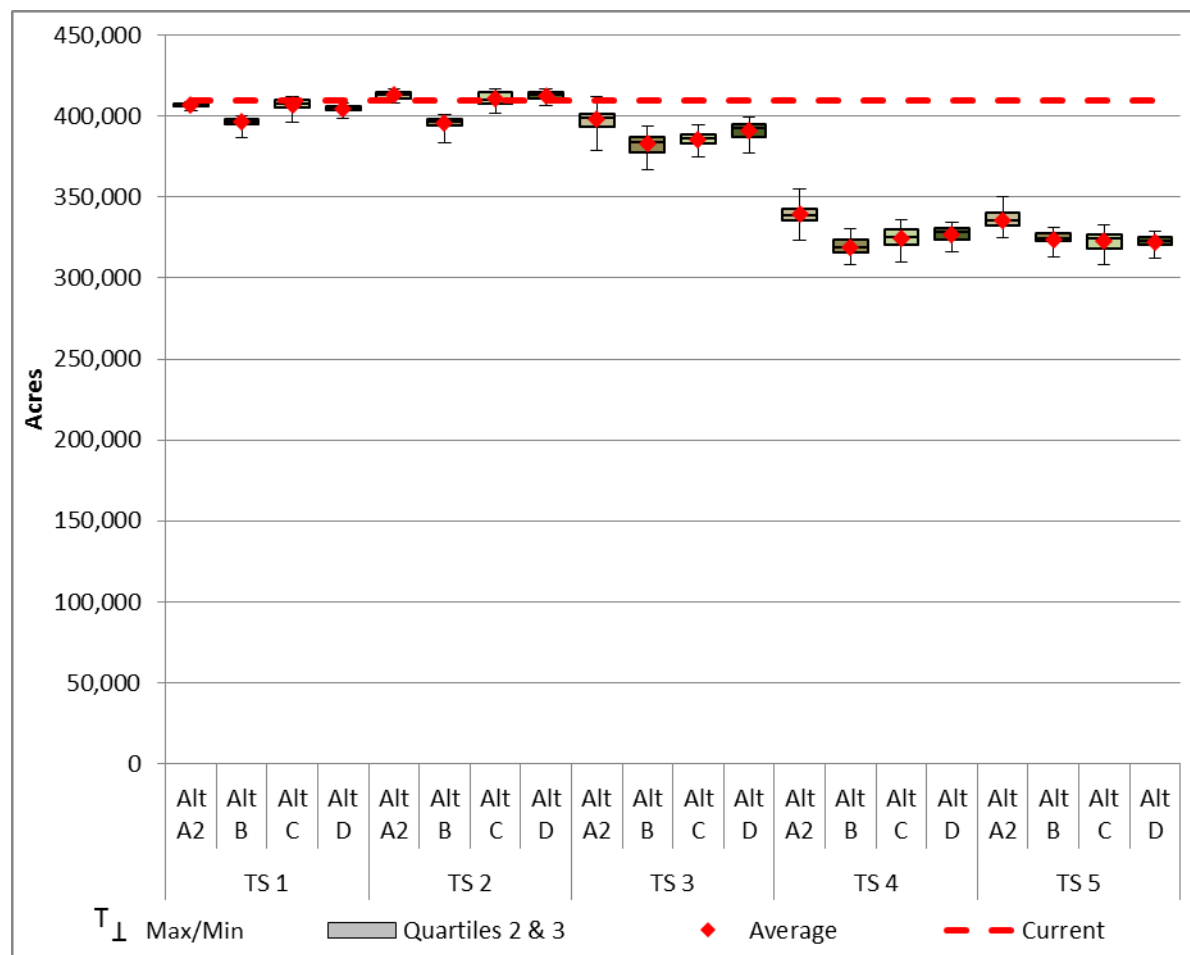


Figure 3-22. Current and modeled levels of mature forest habitat within the connectivity polygons by alternative

National Forest System lands within the selected connectivity areas total about 782,000 acres, representing 33 percent of the Forest's total acreage. Moreover, 34 percent of the connectivity areas are within the wildland urban interface, which is approximately twice the percentage (17 percent) of wildland urban interface acres within the entire Forest. Mature forest is currently present on about 35 percent of the selected connectivity polygons and is estimated to drop to 28 percent by timestep 5. The modeled decline in dense, mature forest habitat within the corridors parallels a modeled decline in marten habitat at the forest scale. The alternatives provide approximately the same levels of habitat in all timesteps. Because a large percentage (34 percent) of the connectivity area acreage is in the wildland urban interface, all alternatives are modeled to meet the desired condition of reducing stand density and making forests more resilient. All alternatives would meet this objective by using different types of stand treatments. For example, alternative A has no prescribed burning, Alternative B has a mix of regeneration harvest, commercial thinning, and prescribed burning, Alternative C places the most emphasis on prescribed burning, and alternative D places the most emphasis on timber production. This suggests that all vegetation management activities have a similar end result, added to the inevitable and unavoidable natural disturbances that are causing the decline in dense, mature forest habitat within the American Wildlands corridors. Although the connectivity areas contain more wildland urban interface acres than the Flathead National Forest has as a whole (34 percent vs. 17 percent respectively), the modeled decline in dense, mature forest habitat is comparable between the connectivity areas and Forest acres. This suggests that wildland urban interface treatments that may be intensive at the project scale are still relatively insignificant compared to natural disturbances from fire, insects, and disease.

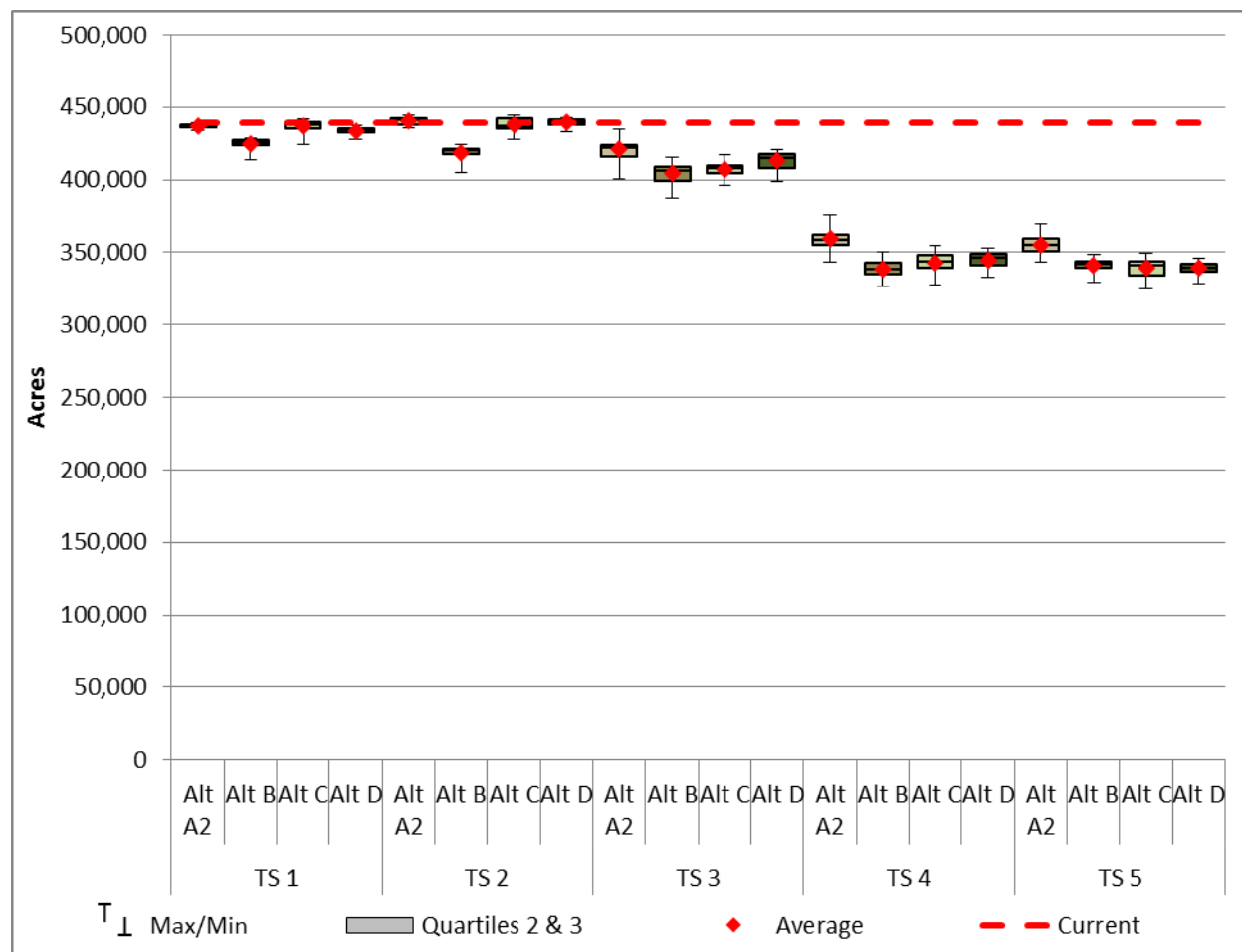


Figure 3-23. Current and modeled levels of forest cover habitat within the connectivity polygons by alternative

Changes in Connectivity Habitat

Levels of dense pole-and larger forest (cover) within the aforementioned American Wildlands polygons (National Forest lands only) are disclosed in Figure 3-23 by alternative and timestep. Existing dense, poleand larger forests within those polygons are displayed by the dashed red line. The mean level of habitat is represented by the boxes on the black vertical lines. Habitat declines by about 100,000 acres through timesteps 3 through 5 but with little difference evident between alternatives

Changes in Mean Patch Size for Mature Forest by Alternative and Timestep

The modeled number of mature forest patches, and the mean patch size within the aforementioned connectivity areas, are disclosed in Figure 3-24 and Figure 3-25 by alternative and timestep. Mean patch size declines substantially, especially in timesteps 3 through 5, with a corresponding increase in the number of patches.

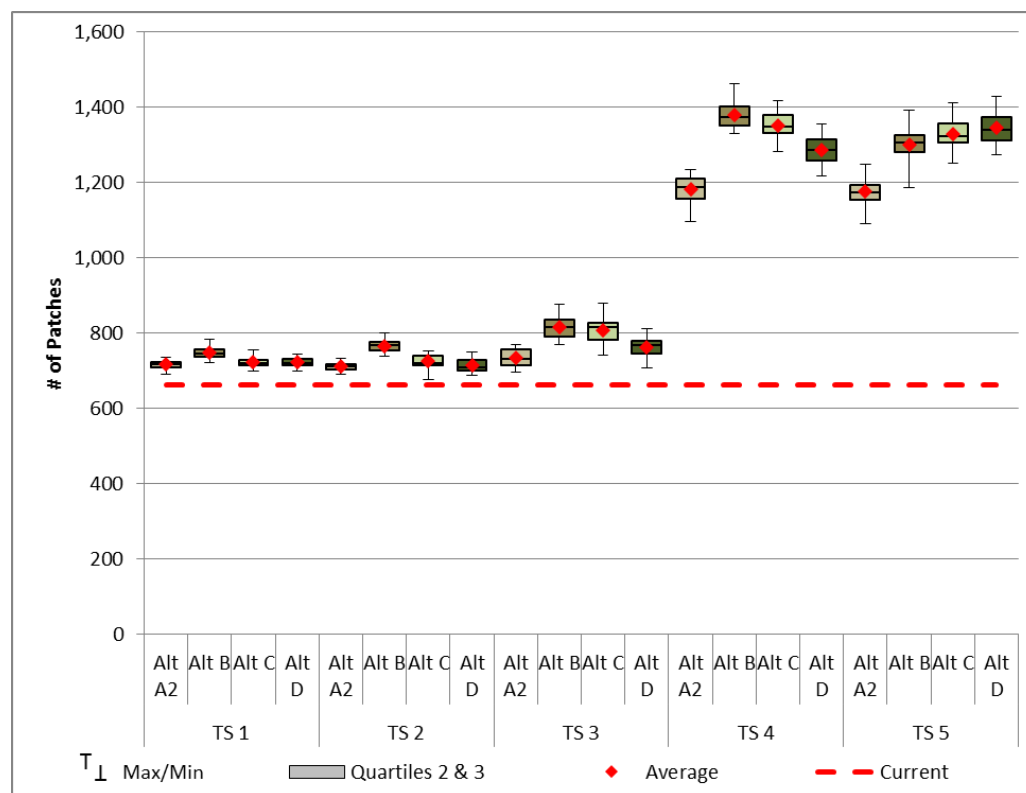


Figure 3-24. Number of patches current and modeled of mature forest habitat within the connectivity polygons by alternative

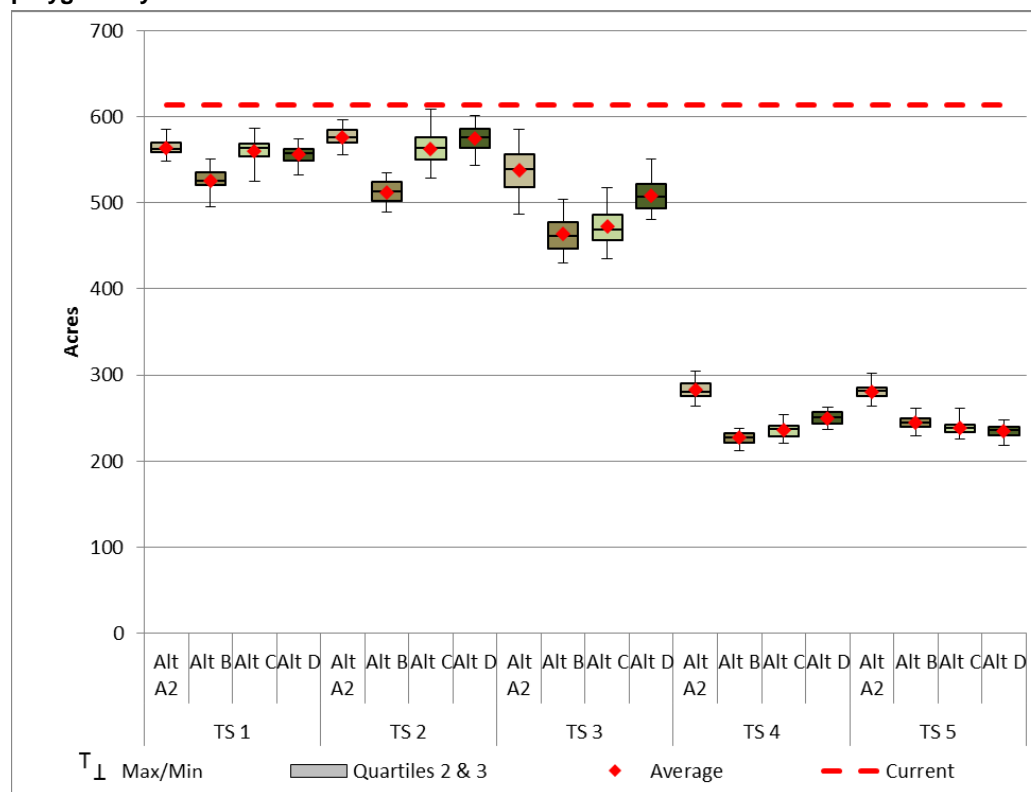


Figure 3-25. Average current and modeled patch size of mature forest habitat within the connectivity polygons by alternative

Declines in mature forest patch size, accompanied by an increase in the number of patches, are presumed to have negative effects on interior forest species (e.g., martens, fishers). Mature forest patch sizes in alternatives B, C, and D show little difference between alternatives by the end of the fifth decade. Alternative A shows slightly less of a decline in mature forest patch size, presumably because alternative A was modeled without prescribed burning to match the original 1986 forest plan.

A substantial portion (34 percent) of the area in the American Wildlands (American Wildlands, 2008) polygons is in the wildland urban interface where people live. The wildland urban interface is where vegetation management would be emphasized and where wildfires would be most aggressively suppressed. Even if fires are suppressed, the model estimates that disease and insect infestations would increase with the expected warmer, drier climates. Insects and disease within mixed species forests tend to create numerous small patches.

Larger, more severe stand-replacing fires could result in some very large, even-aged, early-seral patches and reduce the size of mature forest patches, especially in the cool-moist and cold biophysical settings. Modeling suggests that fire coverage and severity, as affected by slope, aspect, and fire suppression, often cumulatively result in a small patch mosaic, especially in the warm-dry and warm-moist biophysical settings. Modeling over several decades generally predicts that disturbances would tend to reoccur on previously disturbed acres, which further adds complexity to existing patterns of forest cover. For instance, severe burns are often followed by reburns 15-25 years later, after forest debris accumulates on the forest floor. Moderate-severity burns are often followed by bark beetle attacks on weakened, surviving trees, which may add to the patchiness of forest patterns.

These modeled results suggest that the current mix of patch sizes is likely due to a century-long absence of stand-replacing fire, which has allowed stands to reach large or very large size classes and high densities where the boundaries between them become relatively indiscernible. A return to smaller patch sizes is not only likely inevitable and unavoidable but perhaps more normal when we consider the effects of natural disturbances.

3.6.15 Species Associated with Riparian Habitat Conservation Areas or Riparian Management Zones

As illustrated in Figure 3-26, there is a high degree of variation in modeled riparian habitat between alternatives. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation over the 5-decade time period. Acres of riparian habitat in an early succession condition that provide dense shrubs and deciduous trees decline slightly at timesteps 1 and then more substantially at timestep 2, followed by increasing habitat that returns to near current levels for alternatives B and D at timesteps 3 through 5.

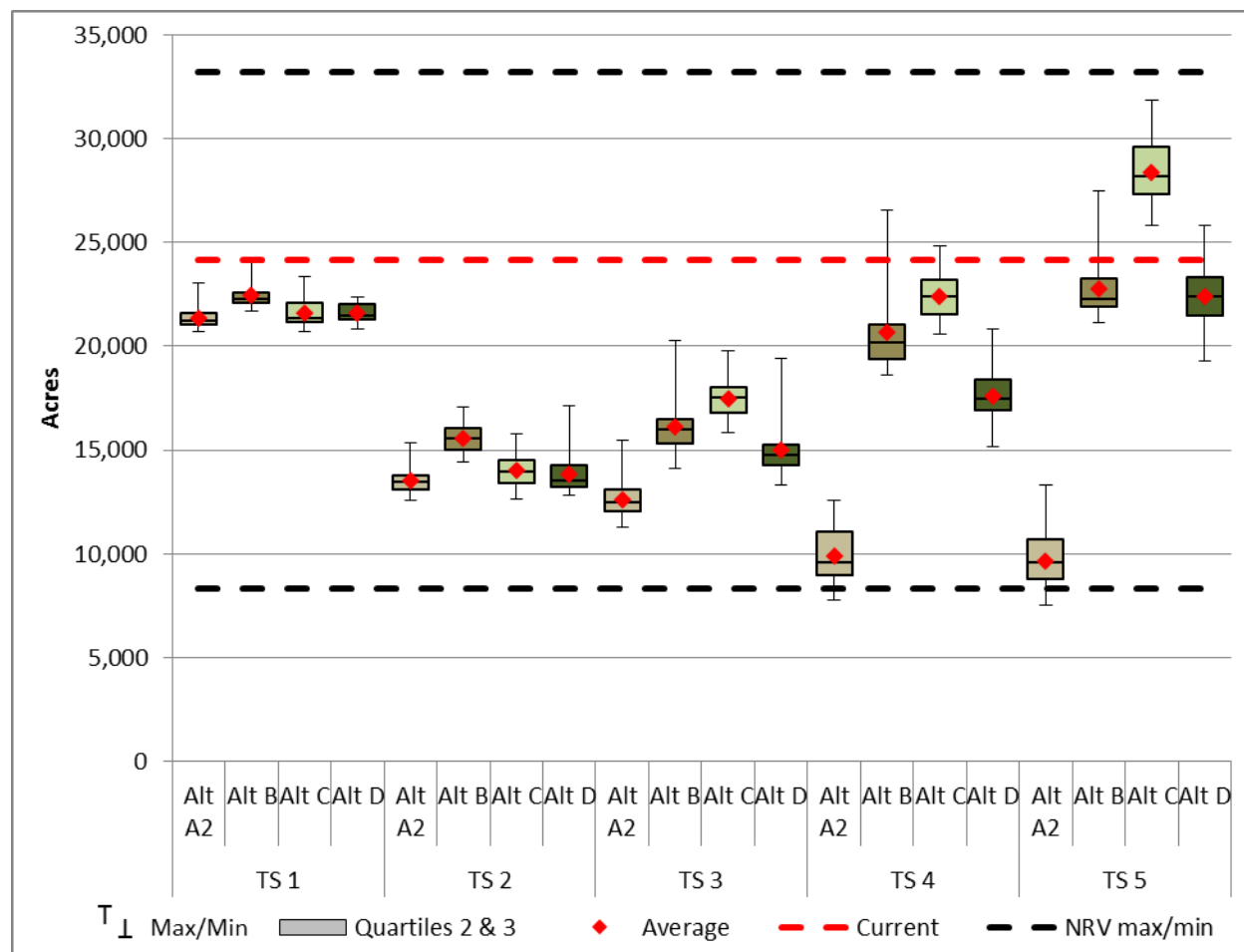


Figure 3-26. Current and modeled levels of riparian habitat conservation area associated species habitat by alternative

Since upland riparian areas generally produce substantially higher levels of shrubs after a reduction in canopy closure, it may not matter much whether that loss in canopy occurs from fire, insects, disease, or vegetation management. Consequently, it is likely that habitat for riparian species associated with shrub and hardwood habitats will stay at or above current levels, assuming that modeled increases in natural disturbances are highly probable by the end of decade 5. Riparian habitat conservation areas are not suitable for timber production, so there is a minimal amount of tree removal modeled in riparian habitat conservation areas under all alternatives. Alternative A stays well below current levels, probably because wildfires are suppressed and there is no prescribed burning. Alternative C slightly exceeds current levels by decade 5, likely because this alternative has the most recommended wilderness and prescribed burning to meet desired conditions.

3.6.16 Northern Goshawk

Acres of modeled habitat by alternative and timestep are disclosed in Figure 3-27. The model predicts all alternatives would stay within the minimum and maximum range of natural range of variation over the 5-decade time period. There is little variation between alternatives. Acres of habitat increase slightly at timesteps 1 and 2, then decline substantially at timesteps 3 through 5. Current levels of habitat are at the maximum natural range of variation, then habitat declines steadily to near the minimum natural range of variation by timestep 5.

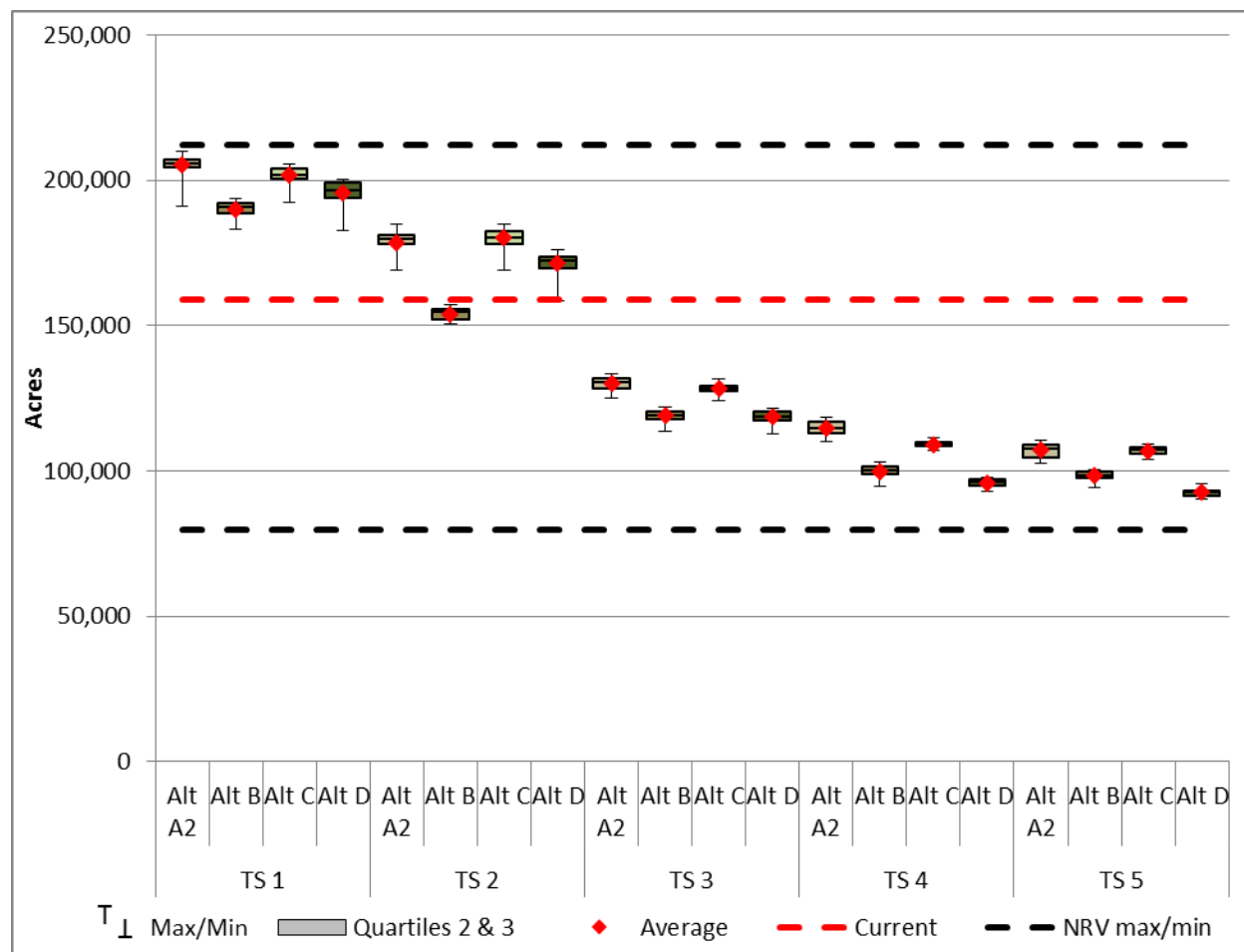


Figure 3-27. Current and modeled levels of northern goshawk habitat by alternative

Vegetation modeling results suggest that there would be an upward trend in the large tree size class but a downward trend over the next five decades in the very large forest size class in all biophysical settings except the warm-dry. The combined acreage of large and very large trees used to model northern goshawk nesting habitat increases slightly through the time period, and therefore the decline is not because large trees are limited but rather because modeled stands will become too open to provide nesting habitat (i.e., less than 40 percent canopy closure). The combination of increased fire, insects, and disease is resulting in a substantial overall decline in modeled canopy closure—which reduces nesting habitat quality and quantity but may increase foraging habitat quality and quantity. Because alternatives B and D provide slightly less modeled nesting habitat (10,000 acres) than alternatives A and C, timber harvest also likely plays a role in reduced canopy closure.

This modeled outcome identifies acres of nesting habitat with no consideration for distribution across the landscape. For that reason, modeled levels of nesting habitat may have little relationship to the actual density of nesting northern goshawks. Northern goshawks are highly territorial and can nest in relatively small, isolated parcels of nest habitat (Squires & Ruggiero, 1996). Research (Clough, 2000) has shown that landscapes fragmented by timber harvest support nest densities comparable to unfragmented landscapes as long as nest habitat persists at levels sufficient to support northern goshawks at maximum densities based on territoriality. Consequently, although the modeled nesting habitat declines over the 5 decades, it remains within the natural range of variation, suggesting there would be no risk to northern

goshawk sustainability regardless of alternative selected and that the actual nesting population might change little over time.

Chapter 4. Conclusions

4.1 Increase in Future Disturbance

In the last two decades there has been a substantial increase in wildfires, insect outbreaks, and root disease across the Northern Region, and several factors suggest that trend will continue. Given that the past two decades were *warmer and drier* based on National Weather Service data, this is a very conservative modeling assumption. For those reasons, the modeled outcome for increased disturbance from fire, insect, and disease has a relatively high level of certainty. What is uncertain is the exact timing or magnitude of changes.

4.2 Reduction in Very Dense Stands

The SIMPPLLE-modeled results suggest that very dense stands will decline substantially with a corresponding increase in open stands. Disturbances that will likely create open stands include moderate-severity fires, bark beetle outbreaks within mixed stands of lodgepole pine and other species, and root disease. High severity fires and bark beetle outbreaks within pure stands of lodgepole pine will continue to recruit grass/forb and seedling-sapling stands. For species and habitats that are disturbance dependent (e.g., black-backed woodpeckers, elk summer range forage), the preceding decade of very active fires (2003-2012) recruited a lot of habitat that, had those fires not occurred, would have likely resulted in habitat at below minimum natural range of variation levels. If fires occur at higher-than-modeled levels, we could expect more stand-replacing events with a higher-than-modeled loss of dense stands and an increase in burned forest.

4.3 Departures from Natural Range of Variation

Other broad-scale analyses (Hessburg et al., 1999) conducted for the Northwest have concluded that some forested habitats, particularly warm, dry habitats dominated by ponderosa pine, are currently below the minimum of natural range of variation. The findings in this analysis indicate current habitat levels for all wildlife species modeled were above the minimum natural range of variation and in one case were higher than the maximum natural range of variation. We suggest that this is due to the area's mix of fire regimes that predominantly burn with stand-replacing or mixed severities. The Flathead National Forest has a virtually no frequent fire/low-severity fire regime. Consequently, whereas ponderosa pine-dominated landscapes on the Bitterroot National Forest have missed five or six fire return intervals in the last century and thus have suffered massive shifts in species composition, size class distribution, and canopy closure, there are few comparable situations on the Flathead. Because of inherent long fire return intervals on most of the Forest's landscape, such as the moist, mid- to high-elevation subalpine fire habitat types, *current* habitat levels are within the maximum and minimum range of natural range of variation for all species.

4.4 Declines in Marten, Fisher, and Northern Goshawk Habitat, White-tailed Deer Winter Habitat, and Lynx Multistoried Habitat

Although these habitats declined by the end of 5 decades, all remained above the minimum natural range of variation, and fisher habitat remained above current levels. Habitat for these species reaches levels near

the maximum range of natural range of variation for timesteps 1 and 2 because of modeled forest succession and because the SIMPPLLE model applies fire suppression logic that would increase the availability of dense, large, or very large stands so that they reach maximum levels that would have occurred historically. However, numerous research findings provide conclusive evidence that such stand conditions predispose those stands to fire, insect, or disease. Those stand conditions, combined with the assumption that timesteps 3 through 5 would have warmer and drier climatic conditions, account for the decline in modeled habitats. A high percentage of roadless and wilderness lands on the Forest preclude most options to reduce the severity of future natural disturbances. Mechanical restoration treatments on timber suitable lands or prescribed burning could reduce the severity of those disturbances in some portions of the Forest, in some situations. Those options, however, are limited due to budget limitations and protective measures for particular species. Those limitations are included in the Spectrum model and apply to all alternatives. Because of those limitations, the SIMPPLLE-modeled outcomes generally show little difference in habitat between alternatives.

4.5 Increases in Flammulated Owl Habitat

SIMPPLLE-modeled outcomes for flammulated owl habitat were much different than outcomes for other Forests and constituted a surprise for the modeling team. A comparable modeling analysis on the Kootenai and Idaho National Forests (ERG, 2012) concluded that flammulated owl habitat was below the minimum natural range of variation and only increased to above minimum natural range of variation levels in alternatives that emphasized vegetation treatments. That outcome was consistent with results reported by Hessburg et al. (Hessburg et al., 1999), who concluded that warm, dry ponderosa pine habitats had suffered severe departures from historical conditions. Conversely, modeled results on the Flathead National Forest suggest existing habitat is above minimum natural range of variation and will increase near maximum natural range of variation by timestep 3.

In retrospect, ponderosa pine are very uncommon on the Flathead National Forest compared to adjacent national forests (i.e., Lolo, Bitterroot, Kootenai National Forests), which explains the limited acres of habitat at both minimum and maximum ranges. Furthermore, habitat within those limited acres of ponderosa pine are on the “moist end” of the dry moisture regime, which means they typically burn naturally at mixed or high severities rather than at low severities like typical warm, dry habitats on adjacent forests. Thus, natural wildfires on the Forest are less likely to create and perpetuate large, open forests than on adjacent Forests. Conversely, human disturbances, including Native American burning that occurred historically and fuel treatments associated with wildland urban interfaces, often result in desired flammulated owl habitat consisting of large, open forest conditions. Much of the flammulated owl habitat is located in the Swan Valley, which contains a high amount of wildland urban interface. Thus, the increase in flammulated owl habitat occurring in timesteps 2 through 5 may be attributable as much to vegetation treatments as to natural disturbances.

4.6 Increases in Black-backed Woodpecker, Moose and Elk, and Riparian Habitat in the Early Successional Stage

Moose and elk summer habitat is currently at the natural range of variation midpoint. This is clearly the result of large wildfires in the preceding decade (2003-2012). Future SIMPPLLE-modeled habitat is near the midpoint of natural range of variation as a result of future disturbances. Based on previous discussions as to the likelihood of those disturbances, this outcome has a high level of certainty.

Black-backed woodpeckers, although disturbance dependent like elk or moose, only benefit from fire for a short period (i.e., up to 10 years) after the event. Although the level of existing habitat is high and near maximum natural range of variation resulting from the preceding decade of active fires, future habitat is

expected to decline to near minimum natural range of variation as a result of modeled levels of fire suppression, in spite of substantial future modeled fires. Acres of riparian habitat in an early succession condition that provide dense shrubs and deciduous trees decline slightly at timestep 1 and then more substantially at timestep 2, followed by increasing habitat that returns to near current levels for alternatives B and D at timesteps 3 through 5. This is likely a result of increasing levels of modeled fire, insects, and disease. Despite these variations, overall levels stay within the natural range of variation.

4.7 Increases in Olive-sided Flycatcher and Pileated Woodpecker Habitat

Olive-sided flycatchers and pileated woodpeckers both require medium, large, and very large trees that are projected to remain at or near current levels over five timesteps. Very dense stands will decline substantially, and moderately dense and open stands will increase as a result of mixed-severity fires, insects, and disease. Olive-sided flycatchers require moderately dense stands adjacent to openings. Pileated woodpeckers require open to dense stands with abundant snags. The combination of medium, large, and very large trees, distributed across landscapes that have a mosaic of fire, insect, and disease-caused mortality, should provide excellent habitat for both species. Based on previous discussions as to the likelihood of future disturbances, this outcome has a high level of certainty. Forest Inventory and Analysis data provide further assurance that current snag densities are sufficient for pileated woodpeckers. Modeled habitat for moose and elk (i.e., seedling-sapling stands) suggests that openings will be sufficient to provide adequate edge habitat for olive-sided flycatchers.

4.8 Changes in Habitat Connectivity and Mature Forest Patch Size

Modeled mean mature forest patch sizes within the American Wildlands connectivity areas (Figure 1-2) decline substantially, especially in timesteps 3 through 5, with a corresponding increase in the number of patches. Declines in mature forest patch size, accompanied by an increase in the number of patches, are presumed to have negative effects on interior forest species (e.g., martens, fishers). Patch sizes in alternatives B, C, and D show little difference between alternatives, suggesting that the mix of vegetation management activities to meet desired conditions, along with disturbances (fire, insect, and disease) are causing the decline in patch sizes of dense, mature forest habitat within these corridors. Alternative A shows slightly less decline in mature forest patch size, presumably because alternative A was modeled without prescribed burning to match the original 1986 forest plan.

The connectivity areas contain proportionally more wildland urban interface acres than the Forest as a whole (34 percent vs. 17 percent respectively). The modeled decline in dense, mature forest habitat, however, is comparable between the connectivity areas and Forest acres. This suggests that wildland urban interface treatments (which may be intensive at the project scale) are still relatively insignificant compared to natural disturbances from fire, insects, and disease.

Arguably, a return to larger, more severe fires (as predicted in timesteps 3 through 5) could result in some very large early seral patches. Modeling, however, suggests that fire coverage and severity, as affected by slope, aspect, and fire suppression, often results in a “small patch mosaic” across the landscape. Modeling over several decades generally shows that disturbances often reoccur on previously disturbed acres, which adds further complexity to existing patterns of forest cover. For instance, severe burns are often followed by reburns 15-25 years later after forest debris accumulates on the forest floor. Moderate-severity burns are often followed by bark beetle attacks on weakened surviving trees that may add to the patchiness of forest patterns.

4.9 Do These Results Suggest Any Species Are at Risk?

All species analyzed have habitat that remains above minimum natural range of variation levels throughout the period of five timesteps, suggesting that none of those species, including the federally listed Canada lynx, are at risk. We attribute this to the Forest's inherently long fire return intervals, which suggest that some Forest landscapes have only missed one or two fire events and most have not missed any. Initial increases in modeled lynx multistoried habitat, which we attribute to the operation of the succession and fire suppression logic of the model, is followed by a modeled decline in timesteps 3 through 5 to near mid-natural range of variation levels, due to inevitable and unavoidable natural disturbances. Some reviewers may interpret the decline in lynx multistoried habitat in timesteps 3 through 5 to be a cause for alarm based on the lynx's federally listed status and the relative importance of multistoried habitat to lynx survival. We suggest, instead, that the modeled changes in lynx multistoried habitat reflect limitations in the carrying capacity of lynx habitat as affected by current conditions, climate, and natural disturbances. Lynx is a wide-ranging species capable of moving long distances, including to and from Canada, as changes in habitat occur. Although multistoried habitat might be protected or recruited at a project scale, based on modeled results, those actions would only be significant at the project scale and not at the forest scale. In addition, although there is a time lag between losses of multistoried habitat and development of stand initiation habitat, snowshoe hares and lynx have persisted with these habitat cycles in the past.

4.10 Fine-scale Management Recommendations vs. Broad-scale Comparisons to natural range of variation

The wildlife research papers cited in this analysis are all based on the habitat preferences of radioed or observed individual animals. They generally show that habitat selection for highly specialized species (e.g., pileated woodpeckers) is strongly correlated to a certain combination of vegetative species, size, density or structure, and/or topographic characteristics at a home range scale. The literature typically includes recommendations for creating or sustaining that desired mix of habitat components with the intent of benefitting that single species. Not surprisingly, some of those recommendations end up as regional direction or forest plan standards applied at the project scale. As an example, the Northern Rockies Lynx Management Direction (2007) limits unsuitable habitat to no more than 30 percent of lynx habitat in each individual lynx analysis unit. However, the analysis of natural range of variation demonstrated that at a forest scale, natural processes such as fire, insects, and disease (over which managers have little control) resulted in some lynx analysis units exceeding the 30 percent standard. This analysis of natural range of variation, current conditions, and modeled future conditions suggests that the scale at which habitat findings are applied should strongly consider the scale at which natural and man-made disturbances occur. SIMPPLLE model-based analyses such as this analysis provide a useful tool for testing different scales (e.g., home range, project, national forest, larger landscape).

4.11 How Do the SIMPPLLE-Modeled Natural Range of Variations Compare with Other Published Historical Range of Variation Estimates?

Comparisons of existing and future habitat to the natural range of variation are given a lot of emphasis in this report. SIMPPLLE-modeled natural range of variations were compared against published information on natural range of variation (ERG, 2012) to determine how similar or dissimilar those results are. Historical range of variation calculations (Hessburg et al., 1999) were made for four different ecological subdivisions on the Flathead National Forest. Conversely, this analysis treats the Forest as one vegetation

unit. Hessburg et al. (1999) categorized old growth as trees greater than 25 inches d.b.h., whereas this analysis categorized very large trees as greater than 20 inches d.b.h. Other examples of dissimilar categories are prevalent between this document and Hessburg et al. (1999). Nonetheless, there are striking similarities between Hessburg et al. (1999) historical range of variation estimates and the modeled natural range of variation outcomes in this report. For instance, Hessburg et al. (1999) concluded that the availability of existing stand initiation stands (seedling-sapling stands) was substantially below the historical range of variation. This report found that seedling-sapling stands were within the range of natural range of variation but only because of the high level of wildfires that occurred between 2003 and 2012 (disturbances that occurred after the Hessburg et al. (1999) report was published). Hessburg et al. (1999) concluded that the current availability of large diameter and old-growth stands exceeded the historical range of variation. This report found that habitats for fisher and marten were near the maximum natural range of variation and that lynx multistoried habitat exceeded the maximum natural range of variation, in spite of the wildfires that occurred between 2003 and 2012. Other comparisons with Hessburg et al. (1999) were similar.

Chapter 5. Addendum

5.1 Evaluation of Changes in Modeled Vegetation Characteristics between the Draft EIS and Final EIS Relative to Wildlife Habitat Model Results

Conducted by Reed Kuennen and Heidi Trechsel, Flathead National Forest, December 2016

5.1.1 Introduction

The Flathead National Forest updated the SIMPPLLE model between the draft EIS and the final EIS, which resulted in differences in future projected conditions for some of the vegetation attributes. This document briefly summarizes the vegetation changes that are relative to the wildlife habitat modeling and provides a discussion of how that might influence the potential effects on the species. Detailed information on model changes and the resulting changes in vegetation can be found in planning record exhibits (Trechsel, 2017a, 2017b; USDA, 2017). The terrestrial vegetation section of the final EIS also contains information on these updates and vegetation changes. An abbreviated summary of the model changes relative to wildlife is provided in the following section.

5.1.2 Summary of model changes

The model was adjusted to project fire activity into the future at three different potential levels: low, moderate, and high. The high was designed to approximate a potential maximum amount of fire as estimated from the natural range of variation analysis. All runs still reflect the same fire suppression strategy as modeled in the draft EIS. These changes to the fire assumptions did not change the general distribution (65 to 70 percent in wilderness/recommended wilderness) or the general pattern (increase/decrease in particular decades) of fire over the model period but did result in the following differences between the draft EIS and the updated final EIS model:

- The average amount of fire per decade across the total 5-decade period increased by about 80,000 acres in the updated model to an average of about 194,000 acres per decade. This results in a total amount of fire over the 5-decade period of about 990,000 acres, an increase of about 400,000 acres compared to the draft EIS.
- The maximum amount of fire that was projected to potentially occur in any particular timestep (e.g., a decade) increased by about 100,000 acres in the updated model to a potential high of about 380,000 acres in decade 2.
- The proportion of stand-replacement fire vs. mixed-severity (more moderate-severity) fire increased by 10 percent in the updated model, with nearly all fires now projected to be stand replacing.
- Model adjustments made to more accurately reflect how Douglas-fir and spruce beetle function in this ecosystem resulted in the following differences over the 5-decade model period:
 - ♦ The average amount of Douglas-fir beetle activity decreased by about 100,000 acres to an average of about 40,000 acres per decade in the updated model. This results in a total amount across the 5 decades of about 200,000 acres in the updated final EIS model compared to about 740,000 acres in the draft EIS model.

- ◆ The maximum level of Douglas-fir beetle activity projected to occur in any particular timestep decreased by about 100,000 acres in the updated model to a projected high of about 60,000 acres in the final EIS.
- ◆ The activity of spruce beetle in the updated final EIS model decreased substantially from the draft EIS, with an average of less than 500 acres per decade forestwide compared to an average of about 134,000 acres per decade in the draft EIS. This results in a total average amount across the 5 decades of about 2,000 acres in the updated final EIS model compared to about 670,000 acres in the draft EIS model.
- ◆ The maximum level of spruce beetle activity projected to occur in any particular decade was about 220,000 acres in the draft EIS model compared to about 1,000 acres in the updated final EIS model.

In addition to these adjustments to modeled disturbances, further correlation of the SIMPPLLE VMap vegetation input database with Forest Inventory and Analysis data for large/very large forest size class and for conifer species presence was performed between the draft and final EIS.

5.1.3 Summary of changes in vegetation conditions

Detailed information on differences in projected vegetation conditions between the draft and final EIS analysis can be found in the Terrestrial Vegetation section of the final EIS and in several planning record exhibits (Trechsel, 2017a, 2017b; USDA, 2016). A brief summary of the vegetation changes that are relevant to the habitat for the modeled wildlife species is provided below.

The main effects to vegetation conditions resulting from the Douglas-fir/spruce beetle model updates would essentially be the reverse of effects resulting from the modification of fire activity. In other words, decreasing Douglas-fir and spruce beetle infestation would reduce tree mortality and favor the maintenance of or increase in the larger forest size classes (particularly the large/very large size class), maintain or increase moderate- and high-density forests, and perhaps shift forest dominance types or alter species presence proportions. In contrast, increasing fire activity removes acres from the small and larger forest size classes and from the medium- and high-density forest classes, returning them to seedling/sapling forests and, typically, low to very low density. Increased fire might also favor fire-adapted or fire-resistant species such as lodgepole pine and larch. So in a sense there is some “cancelling out” that is occurring in the results of these two model updates that tempers and lessens the overall difference in vegetation outputs between the draft EIS and final EIS that might have occurred had only one or the other model modification been made. As stated in section 4.2, more acres of beetle activity have been reduced overall in the model (about three times as much) when compared to the increase in acres of fire. This equates to a reduction of about 150,000 acres on average per decade that used to be impacted by Douglas-fir or spruce beetle in the draft EIS modeling but not in the updated final EIS model. This would tend to produce model outputs that more obviously reflect the changes due to decreased beetle activity rather than those of fire, namely, higher amounts of larger forest size classes and high-density forest conditions along with increases in spruce or Douglas-fir. The remainder of this section discusses the relevant changes in more detail for each modeled vegetation condition.

Tree species composition: For the most part, the direction of trends over time for forest dominance types and species presence are the same in the updated model as they were in the original. The rate of increase/decrease is sometimes different (for example, Douglas-fir still declines in the warm-dry potential vegetation type, but not as steeply as it did in the draft EIS). Spruce presence is the main exception to this, where it shows a strong upward trend forestwide and in all potential vegetation types where it is present compared to downward trends in the original draft EIS modeling. This is due to the lower levels of spruce beetle activity projected in the updated model. The reduced levels of Douglas-fir beetle have a relatively

minor effect on Douglas-fir dominance and presence compared to the original draft EIS modeling. Trends for Douglas-fir are the same, although the rate of change may be less steep. Overall, the increased amount of modeled fire generally tends to favor the more shade-intolerant early- to mid-successional species (ponderosa pine, western larch, whitebark pine, lodgepole pine, and western white pine), as was the case in the draft EIS modeling. However, fire-sensitive shade-tolerant species, particularly subalpine fir and spruce, continue to expand their distribution and dominance across the landscape, suggesting that the increased amount of fire in the updated model may have slowed but not changed this trend.

Forest and tree size classes: The updated model produces the same trends forestwide and in most of the potential vegetation types for the proportion of large and very large forest size classes over the next 5 decades comparing to the draft EIS. However, the trends are more favorable in the final EIS—i.e., the increase is greater or the decrease is less. The increases in large size class appears to be associated with a greater decrease in the medium size class in the updated model compared to the original. These changes in the medium, large, and very large size classes are attributable to the decrease in the modeled Douglas-fir and spruce beetle levels because the removal (death) of the larger-diameter trees is occurring at a lower rate and there is better retention of larger-diameter trees over time.

The increased amount of fire that is modeled in the updated final EIS analysis would affect all forest size classes, converting forests in the small, medium, large, and very large size classes to the seedling/sapling size class. Though this has probably limited the amount of increase over time in the small and larger forest size classes, the increase in fire levels—and particularly in stand-replacing fire—has the most obvious influence on the seedling/sapling size class. The updated model shows increased amounts of the seedling/sapling forest size class, although the proportion still remains well within the estimated natural range of variation.

Forest densities: The decrease in Douglas-fir and spruce beetle activity in the final EIS modeling results in the retention of more moderate- and high-density stands and less of the low-density stands because density is not reduced by tree mortality. Forestwide, the low-density forests show a decrease instead of the increase in the draft EIS. The very low canopy cover class shows an increasing trend in all potential vegetation types, both in the final EIS and the draft EIS. Fire appears to be the primary agent maintaining this low-density class, and these forests are probably mostly in the seedling/sapling forest size class.

5.1.4 Changes related to wildlife habitat modeling and the natural range of variation

The Forest's planning team silviculturist and wildlife biologist reviewed and discussed the updated model results and interpreted them in light of the model parameters for each wildlife species. Although the magnitude of predicted effects for the species would likely change due to the model modifications, effects would remain within the natural range of variation and the trend patterns would remain the same.

Comparison of the first set of vegetation modeling results with the second set showed that we initially modeled "a worst-case scenario" for species with declines in habitat. An evaluation and conclusion for particular species follows. It is organized based on the sections within ERG's Modeled Wildlife Habitat Assessment, which is the main document in this appendix.

5.2 Section 4.4 Declines in Marten, Fisher, and Northern Goshawk Habitat, White-Tailed Deer Winter Habitat, and Lynx Multi-storied Habitat

Marten

The overall reduction in Douglas-fir and spruce bark beetle activity would maintain higher levels of canopy cover in modeled marten habitat. An increase of stand-replacing wildfire could reduce canopy cover in marten habitat, but there would still be a net gain of up to 150,000 acres on average per decade in comparison to the first set of model outputs.

Fisher

Since Douglas-fir beetle and spruce bark beetle attack and kill very large trees that can provide resting habitat and contribute to the complex structure needed by fisher, and since fisher are not as sensitive to changes in live tree canopy cover as marten, the initial modeling did not show as steep a decline in habitat as it did for marten. Reducing the extent of Douglas-fir beetle and spruce bark beetle on over 200,000 acres would maintain higher canopy cover and more very large live trees, especially in the warm-moist potential vegetation type, so the declining trend in fisher habitat would not be as steep. Although the increase of stand-replacing wildfire by about 80,000 acres average per decade could increase very large snags and down logs in fisher habitat, modeling shows that these increases in wildfire are not as likely to occur in the warm-moist mixed cedar/hemlock/white pine/larch stands that were modeled as fisher habitat as they are in the other potential vegetation types.

Northern Goshawk

Because goshawks nest on the branches of very large live trees and snags such as Douglas-fir, reducing the extent of Douglas-fir beetle and spruce bark beetle on about 234,000 acres average per decade forestwide would increase very large trees, benefitting goshawks by providing potential nesting trees. Increasing stand-replacing wildfire on about 80,000 acres would increase goshawk nesting and foraging habitat in comparison with the initial model outputs.

White-Tailed Deer Winter Habitat

Because snow-intercept cover is provided by full-crowned trees such as live Douglas-fir, reducing the extent of Douglas-fir beetle and spruce bark beetle on about 234,000 acres average per decade would be likely to provide more snow-intercept cover. Modeling in the warm-dry potential vegetation type shows a stronger increase in the large forest size class and in the moderate canopy cover class with the updated model and a less steep trend downward in the high canopy cover class as compared to the original modeling in the draft EIS. Similar to the analysis in the draft EIS, under the updated model Douglas-fir presence decreases on the warm-dry potential vegetation type but at a slower rate, thus retaining more Douglas-fir in this potential vegetation type and increasing the probability of more snow-intercept cover.

Lynx Multistoried Habitat

Outputs of the initial model run showed that multistoried habitat would increase during the first two timesteps (2 decades). This increase might be less than modeled, however, because if fewer spruce are killed, fewer canopy gaps are created and there is less opportunity for a dense understory to grow. The decline in multistoried habitat by the fourth and fifth timesteps would likely be less as well because the extent of tree mortality from Douglas-fir beetle and spruce bark beetle would be decreased across about 150,000 acres average per decade above the increase in fire. An increase in the combined medium, large, and very large size classes occurs in the updated modeling, as well as an increase in the amount of

moderate and high canopy cover classes. There would be fewer large dead trees falling down, so higher canopy cover would be maintained. If stand-replacing wildfire occurs on about 80,000 more acres, it would initially create more temporarily unsuitable habitat for about the first two timesteps, followed by an increase in stand initiation hare habitat for the subsequent timesteps. However, the amount of additional fire in the updated model is not enough to offset the favorable effects of reduced Douglas-fir and spruce bark beetle in creating multistoried habitat.

5.3 Section 4.5 Increases in Flammulated Owl Habitat

Flammulated owls nest within cavities in very large snags in mixed ponderosa pine/Douglas-fir stands, interspersed with openings for foraging and patches of small trees for roosting. Initial modeling results showed that these conditions occurred on slightly more acres in the future, due mainly to fire and vegetation treatments (including prescribed burning and/or timber harvest), which reduced forest density and created open patches. In the updated model, the presence of ponderosa pine increases in the warm-dry potential vegetation type, as it does in the original draft EIS analysis, but at a faster rate. With the extent of Douglas-fir beetle decreasing on about 100,000 acres average per decade, the amount of larger Douglas-fir trees in the warm-dry type would likely increase. The large and very large forest size classes combined cover a much larger proportion of the warm-dry type (up to about 55 percent of the area) in the updated model analysis compared to a high of about 25 percent of the area in the draft EIS analysis. Reduced Douglas-fir beetle would also tend to reduce the amount of snags and create fewer canopy gaps and open forest conditions across the war- dry and warm-moist potential vegetation types that provide flammulated owl habitat. Low-density stands show an increase with the updated model for the warm-dry potential vegetation type, but this is slightly less (about 8 percent) than the increase indicated in the original model. An increase in stand-replacing wildfire over about 80,000 acres average per decade more than initially modeled could create snags for nesting but would reduce roosting habitat for one or two timesteps (decades).

5.4 Section 4.6 Increases in Black-Backed Woodpecker, Moose and Elk, and Riparian Habitat in the Early Successional Stage

Black-Backed Woodpecker

If stand replacing wildfire occurs on about 80,000 acres average per decade more than initially modeled, it would create more feeding and nesting habitat for black-backed woodpeckers. All alternatives would shift upward, and wildfires would maintain habitat near current levels.

Moose and Elk

An increase in the extent of stand-replacing wildfire on about 80,000 acres average per decade more than initially modeled would increase forage for elk and moose. The seedling/sapling forest size class would increase in the updated model forestwide and in most of the potential vegetation types.

Riparian Habitat in the Early Successional Stage

If stand-replacing wildfire occurs on about 80,000 acres average per decade more than initially modeled, some of the increase in fire could occur in riparian areas, creating a greater amount of early successional habitat.

5.5 Section 4.7 Increases in Olive-Sided Flycatcher and Pileated Woodpecker Habitat

These species are associated with a landscape mosaic and benefit from the effects of fire, insects, and disease, so changes in model outputs would generally be beneficial. Pileated woodpeckers nest in very large snags and feed on medium to very large trees, snags, and down wood, whereas flycatchers perch in snags or live trees and aerially forage in open forest stands and canopy gaps. Increases in large and very large forest size classes would improve habitat conditions for pileated woodpecker.

5.6 Section 4.8 Changes in Habitat Connectivity and Mature Forest Patch Size

Connectivity of forested habitat was modeled for marten. If stand-replacing wildfire occurs on about 80,000 acres more than initially modeled, it could reduce forested habitat connectivity in portions of the landscape. However, the reduction in the level of Douglas-fir beetle and spruce bark beetle on about 234,000 acres is beneficial to habitat connectivity in that it maintains the moderate- and high-density forest conditions and the larger forest size classes to a higher degree than in the original model. The overall effect should be more favorable to maintaining connectivity of mature forest habitat.

Large, stand-replacing wildfires can initially decrease mature forest patch size. If repeat burns occur, this then creates a mosaic of smaller patches of different age classes. The effect that beetles have upon mature forest patch size depends upon whether the beetles kill the majority of trees in a forest stand and return the forest stand to an early successional forest or kill scattered individual trees without changing the successional stage of the forest stand.

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Wilderness Recommendation Process

Introduction

When developing or revising a forest plan, the Forest Service must identify and evaluate lands that may be suitable for inclusion in the National Wilderness Preservation System and determine whether to recommend any such lands to be designated as wilderness. This is done in four steps: inventory, evaluation, analysis, and recommendation. This appendix describes the process and includes the outcomes of each of the four steps. Refer to Trechsel (2015) for additional information on the analysis used in the wilderness recommendation process.

Public participation

The Flathead National Forest has actively engaged the public, tribes, other local governments, and State and Federal government agencies throughout this process to acquire feedback and input on the inventory, evaluation, and analysis of areas for wilderness recommendation. The public provided feedback and input on the inventory, evaluation, and analysis of areas for wilderness recommendation. The public commented on individual wilderness inventory areas using (1) individual worksheets provided for each inventory area and (2) the online interactive Talking Points Collaborative Mapping web tool on the Flathead National Forest website.

On May 12, 2014, an interactive map was made available on the Flathead National Forest website displaying the initial identification and inventory of lands that might be suitable for inclusion in the National Wilderness Preservation System. A draft of this paper explaining the methodology was also available for comment. These products were provided to the public for their input, with a 45-day comment period.

The Talking Points Collaborative Mapping web tool for the wilderness inventory and the wilderness evaluation worksheets were posted on the Forest's website on August 9, 2014, originally for a 3-week comment period, but this was later extended to a 30-day comment period. During this period, the public was asked to provide feedback on the measures proposed for the wilderness evaluation. In addition, the Forest requested input about the areas included in the inventory. Although some measures are dependent on a geospatial analysis of our data, such as acres of maternal wolverine denning areas or percent of areas without invasive weeds, other measures are dependent on field knowledge, such as the sights and sounds of the area or the outstanding geological formations in an area.

The Flathead National Forest's draft forest plan and draft environmental impact study (EIS) were released in May 2016. The draft EIS did not include a preferred alternative. The analysis of the lands recommended for wilderness in the draft EIS ranged from 0 acres in alternative D to 506,919 acres in alternative C (see figures 1-64 to 1-66). The Forest received many comments on the draft plan and draft EIS regarding the acreage and management of recommended wilderness. See step 4 below for a list and maps of recommended wilderness areas for alternative B modified, the preferred alternative identified in the final EIS.

Definitions of key terms and concepts

The following terms and concepts are used throughout this appendix (refer to the glossary in this volume of the final EIS for additional definitions):

The descriptions of **coarse-scale key connectivity** for various wildlife species are drawn from Squires et al. (2013; Canada lynx), McKelvey et al. (2011; wolverine), Waller and Servheen (2005; grizzly bear), Weaver (2014; grizzly bear, wolverine, and mountain goat), Ament et al. (2014; process), and Montana Fish, Wildlife and Parks (2014).

Key conservation areas for wolverine are defined by Weaver (2014, pp. 49-53). Weaver scored conservation importance for wolverines based upon two models: 1) the Copeland model of persistent snow cover that encompasses the time period through the end of the wolverine's reproductive denning period and 2) the Inman model that encompasses suitable habitat for resident adult wolverines, reproductive females, and dispersers.

Key conservation areas for mountain goat are determined by Weaver (2014, pp. 56-59). Weaver scored conservation importance for mountain goats based upon terrain ruggedness, elevation, and aspect (see pages 56-59 for more details).

Maintenance level 1 roads are roads that have been placed in storage between intermittent uses.

Minimally represented species or vegetation types are current tree species/vegetation types that are considered to have disproportionately low occurrence in existing wilderness areas regionwide relative to the overall Forest Service land base in the USDA Forest Service Northern Region (defined as less than 10% of the overall occurrence on the land base). The analysis of minimally represented species was conducted in step 2 (the evaluation of wilderness inventory areas). Rare species are plants listed as rare by the Montana Natural Heritage Program.

Areas with **outstanding opportunities for solitude or for a primitive and unconfined type of recreation** do not have to possess outstanding opportunities for both elements, nor do they need to have outstanding opportunities on every acre. Consider impacts that are pervasive and that influence a visitor's opportunity for solitude.

Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest) refers to land that is not affected by past timber harvests of all types—both regeneration harvests (clearcut, seedtree, and shelterwood cuts) and intermediate cuts (e.g., commercial thins, salvage cuts). Information on timber harvests is from the Forest Service Activity Tracking System database.

Species richness percent of total acreage was determined using the Crucial Areas and Connectivity Assessment data layer developed by MFWP (2010) Species richness is the average number of species associated with a specific habitat.

A **standard or terra trail** is defined as a trail whose predominant foundation is ground (as opposed to snow or water) and is designed and managed to accommodate ground-based trail use.

Underrepresented ecological groups are ecological systems that are not currently represented or minimally represented within the wilderness system or system of research natural areas on the Forest. Fourteen underrepresented ecological groups were determined to be present in the recommended wilderness areas (based on what was determined to be underrepresented within the designated wilderness areas on the Forest). Presence and area of underrepresented ecological groups is one of the factors used in

step 3, the analysis. Refer to the recommended wilderness methodology in section 3.15 of the final EIS for more information.

Whitebark pine plus trees are defined as genetically superior trees that show natural resistance to blister rust. As part of the whitebark pine restoration program, these trees provide seed for natural regeneration and for growing seedlings in a nursery for planting. Protection includes reducing adjacent fuel loads, treatment to protect them from beetle attack, and thinning young (sapling) stands to increase their vigor and potential to survive mortality.

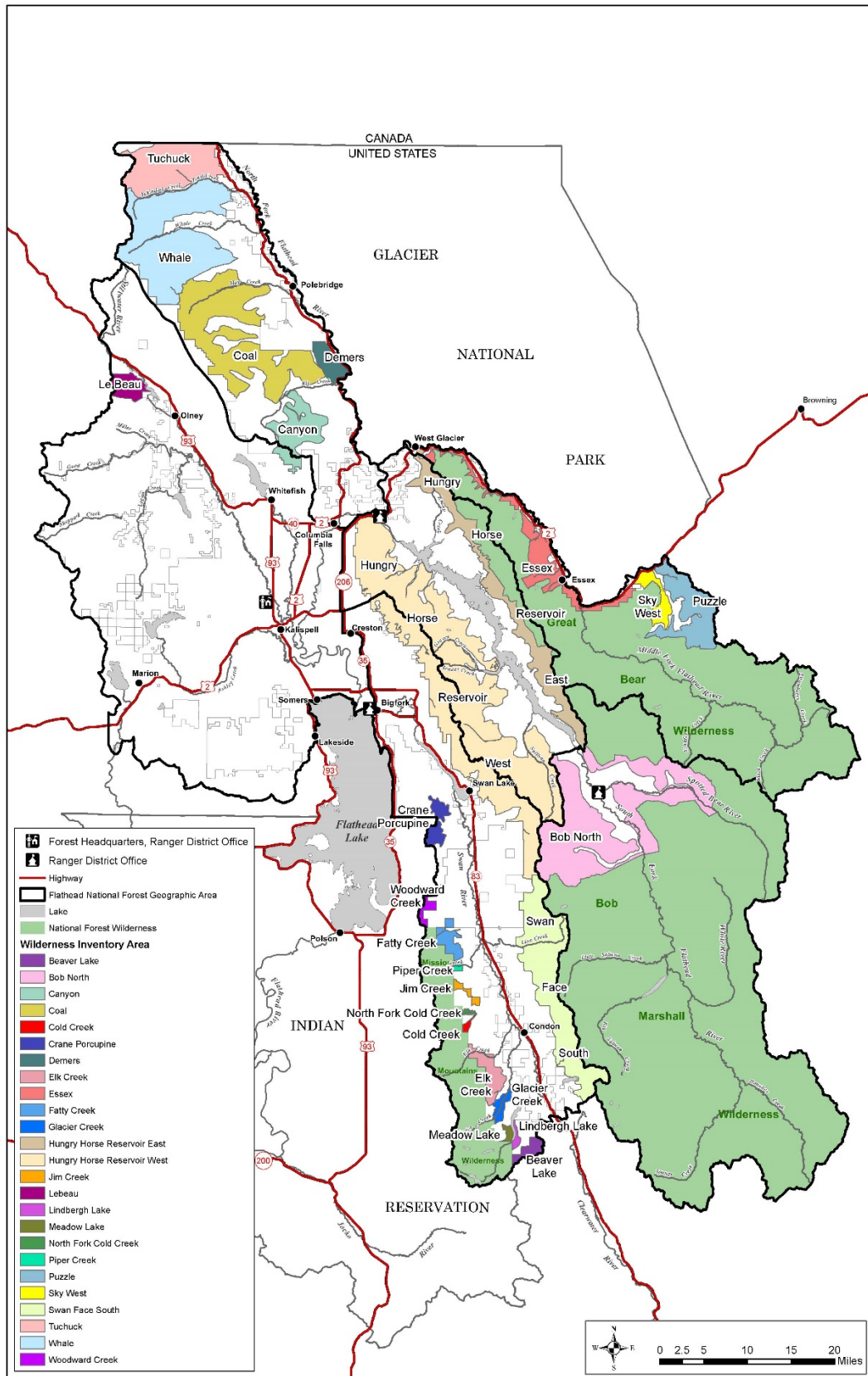


Figure 4-1. Wilderness inventory areas on the Flathead National Forest

Step 1. Identification and Inventory

Developing the Inventory

The primary function of step 1, identification and inventory, is to efficiently and effectively identify all lands within the plan area that may have wilderness characteristics as defined in the Wilderness Act of 1964 (16 U.S.C. 1131–1136, 78 Stat. 890), using a transparent process. Lands included in the inventory are documented and identified on a map and carried forward for further evaluation.

To develop the inventory of lands on the Flathead National Forest that might be suitable for recommendation as wilderness, the Forest used three categories of inventory criteria (size, forest road improvements, and other improvements) and information obtained for the assessment of the Flathead National Forest (USDA, 2014), as directed by the Forest Service Handbook. **Note: Lands included in the inventory provided a starting point for further evaluation, and their inclusion in the inventory is not a designation that conveys or requires a particular kind of management.**

Criteria for Including Lands in the Inventory

Size

When considering the size of potential areas for inclusion in the inventory, the following were included:

- National Forest System lands outside of existing designated areas that were at least 5,000 contiguous acres or greater;
- areas contiguous to an existing wilderness, primitive area, administratively recommended wilderness, or wilderness inventory of other Federal ownership, regardless of their size.

For areas less than 5,000 acres, each district ranger met with district staff to consider and determine whether such areas could be preserved in an unimpaired condition.

Improvements

Lands to be considered for inventory may or may not have improvements. Improvements consist of things that show evidence of human activities such as roads, structures, or past management activities. The presence of such improvements does not necessarily exclude areas for consideration for the inventory.

Forest road¹ improvements

Included in the inventory are the following areas with road improvements. Guidance on forest road improvements considered can be found in Forest Service Handbook 1909.12 chap. 70 sec. 71.22a.

1. Areas that contain objective maintenance level 1 forest roads.
2. Areas with routes that are decommissioned, unauthorized or temporary or forest roads that are identified for decommissioning in a previous decision document or in travel management plan or travel analysis.

¹ A forest road is defined as a road wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the System and the use and development of its resources (36 § CFR 212.1). For definitions of the various maintenance levels of forest roads, see “road” in the final EIS glossary.

3. Areas with forest roads that are identified to be reclassified to maintenance level 1 in a previous decision document or in a travel management plan or travel analysis.
4. Areas with forest roads that were proposed for consideration as recommended wilderness in the 1986 Forest Plan, in the draft 2006 Forest Plan, and through public involvement during the development of the Assessment of the Flathead National Forest. (USDA, 2014)
5. Areas with historic wagon routes, historic mining routes, or other settlement-era transportation features considered part of the historical and cultural landscape of the area.

Excluded from the inventory are areas that have the following road improvements:

1. Permanently authorized roads validated by a Federal court or the Department of the Interior for which a valid easement or interest has been properly recorded.
2. Forest roads maintained to levels 3, 4, or 5.
3. Areas of forest roads maintained to level 2 (all Forest roads maintained to level 2 receive some type of mechanical treatment to ensure relatively regular and continued use).

Other improvements

Other improvements on the Forest were reviewed to determine whether to include or exclude certain areas in the inventory (table 4-1). Guidance on improvements considered can be found in Forest Service Handbook 1909.12 chap. 70 sec. 71.22b.

Table 4-1. Determination of whether areas with certain types of improvements were included or excluded from the Flathead National Forest wilderness area inventory, with guidance from the Forest Service Handbook.

Improvement Type and Guidance	Remarks
Airstrips	Airstrips were excluded from the inventory because the three existing airstrips on the Forest are next to open roads.
Heliports	These are temporary structures and were included in the inventory, when present.
Vegetation treatments that are not substantially noticeable.	These were included in the inventory. The definition of "substantially noticeable" and how the interdisciplinary team used the concept in the inventory is presented on pp. 4-14 to 4-15.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Timber harvest areas where logging and prior road construction are not substantially noticeable were included in the inventory. Areas where regeneration harvest had taken place within the last 40 years and where significant fire had occurred were reviewed in detail to determine if they should be included in the inventory. The determination for substantially noticeable, and how the interdisciplinary team used the concept in the inventory, is presented on p. 4-6.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	It was determined that these vertical structures have minimal impact, including their maintenance and access requirements; therefore, areas with vertical structures were included in the inventory.

Improvement Type and Guidance	Remarks
Areas of historical mining where impacts are not substantially noticeable.	Few areas of historical mining activity exist on the Flathead National Forest; therefore, these areas were included in the inventory.
Areas of mining activity where impacts are not substantially noticeable.	Areas of mining activity are minimal on the Flathead National Forest; therefore, these areas were included in the inventory.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	Few areas that have range improvements exist on the Flathead National Forest; therefore, these areas were included in the inventory.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps. As a general rule, do not include developed sites. Areas with minor, easily removable recreation developments may be included.	Areas with dispersed camping sites and outfitter camps were included in the inventory as they are temporary and easily removed. Areas with developed recreation sites were excluded from the inventory. Note: trails are not considered a recreational improvement.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	Whether these are included or excluded is dependent on the type of phone or power line. Most power lines are in main road corridors, which were not included in the wilderness inventory areas. Small buried water transmission lines were included in the wilderness inventory.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions. Areas may include minor watershed treatments that have been accomplished manually, such as small hand-constructed gully plugs.	Few areas of watershed treatment exist on the Flathead National Forest; therefore, these areas were included in the inventory.
Lands adjacent to development or activities that impact opportunities for solitude. The fact that a non-wilderness activity or use can be seen or heard from within any portion of an area shall not, of itself, preclude inclusion in the inventory.	Areas adjacent to development or activities were included in the inventory.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Areas with structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area were included in the inventory.

Areas Included in the Inventory

The areas listed in table 4-2 are areas the planning team identified and included in the inventory and carried forward for further evaluation. For step 2, the wilderness evaluation, the interdisciplinary team took a more detailed look at these inventoried areas to determine how well they meet wilderness characteristics, using a set of criteria based on the Wilderness Act of 1964.

Table 4-2. Wilderness Inventory Areas (Names and Acreage)

Area	Acres
Beaver Lake	3,542
Bob North**	88,041
Canyon	18,814

Area	Acres
Coal	67,184
Cold Creek	674
Crane Porcupine ²	5,338
Demers	6,959
Elk Creek	7,739
Essex	23,061
Fatty Creek	4,963
Glacier Creek	2,590
Hungry Horse Reservoir East*	37,152
Hungry Horse Reservoir West*	178,536
Jim Creek	1,509
Le Beau	6,340
Lindbergh Lake	1,019
Meadow Lake	1,033
North Fork Cold Creek	445
Piper Creek	590
Puzzle	24,110
Sky West	6,266
Swan Face South*	52,958
Tuchuck	34,189
Whale	69,597
Woodward Creek	2,198
TOTAL	644,847

* Previously part of the Bear-Marshall-Scapegoat-Swan-Hungry Horse area.³

** The Bob North area was revised on August 19, 2014, to exclude Silvertip Cabin, a reduction of 52 acres.

Determining substantially noticeable

The term “substantially noticeable,” as it relates to wilderness evaluations, is not defined in the Forest Service Handbook’s sections on wilderness evaluation (Forest Service Handbook 1909.12 chaps. 70, 71.22b). The planning team’s vegetation, and scenery specialists developed a process to determine “substantially noticeable” in regards to timber harvest and associated roads. The process focused on what a viewer would likely observe when viewing harvest areas and associated roads from the background, midground, and foreground of an area. This process assisted in determining whether or not vegetation treatments, timber harvest, and prior road construction are substantially noticeable and, consequently, whether or not an area should be included or excluded from the wilderness evaluation inventory.

² When reviewing the wilderness inventory process, the planning team identified this new area that was over 5,000 acres.

³ Because the Bear-Marshall-Scapegoat-Swan-Hungry Horse area in the draft wilderness inventory was very large (352,165 acres), the planning team felt that to adequately evaluate the land for wilderness character, it was necessary to separate this area into smaller parts. The Bear-Marshall-Scapegoat-Swan-Hungry Horse area was divided along the geographic area boundary lines, except for splitting the Swan Face area from the Hungry Horse Reservoir (to make the Hungry Horse Reservoir West polygon), which followed the 1986 forest plan’s recommended wilderness line for a short distance.

For the purpose of this wilderness evaluation process, vegetation treatments and timber harvest are considered different activities.

Vegetation treatments

These include only prescribed fire use and non-commercial fuel reduction treatments that do not produce wood products. These types of treatments generally have not created substantially noticeable effects on the Flathead National Forest landscape. For these reasons, the planning team included vegetation treatment areas in the wilderness evaluation inventory.

Timber harvest activities

Based on the following factors, the planning team determined that regeneration timber harvest (such as clearcuts and seed tree harvests) and associated road-building activities that were conducted within the last 40 years (since 1974) are substantially noticeable on the Flathead National Forest. This determination was based on factors such as tree height growth, stand productivity, stand densities, time of tree regeneration, topographic features (such as slope), abundance and type of ground vegetation (such as shrub density), and distance from harvested area. There is obvious variability in stand conditions across the Forest, but for the purposes of this inventory process and due to the need to consider all National Forest System lands outside of existing wilderness (1,024,526 acres), the timeframe of 40 years was used as a point of time within which, in general, areas harvested were considered substantially noticeable. However, the planning team reviewed in detail areas that had had regeneration harvests as well as fire to determine whether the fire had ameliorated the effects of the harvesting. The planning team made a case-by-case determination of whether those areas were still considered to be substantially noticeable. If they were determined not to be substantially noticeable, they were included in the wilderness inventory. If they were determined to be still substantially noticeable, they were excluded from the inventory.

Tree growth rates (height growth), especially in young, immature tree stands, depend upon site productivity. Average stand height growth was estimated across all sites on lands suitable for timber production. On the better growing sites of the Flathead National Forest, the average stand height increases by about 11 inches per year during the first 40 years of growth. On the poorest sites, average stand height may increase on average about 6 inches per year. Therefore, on the Flathead National Forest, a 40-year-old stand would generally have a height range of 20 to 37 feet, depending on site productivity.

What a viewer is likely to see

Boundaries of past regeneration harvest units on the Flathead National Forest are typically geometric in shape, with straight lines that contrast with unharvested areas. When viewed from the background (4 or more miles away), harvested areas are typically very distinct, with the line of delineation between harvested areas and unharvested areas substantially noticeable from the background view.

Roads within and surrounding harvested areas are particularly visible during the first few decades after harvest until young trees have gained sufficient height to block views of the roads. In areas with steep terrain, the steep slopes increase the visibility of prominent cut-and-fill slopes and require longer time periods before trees are tall enough to block continuous views of the roads.

After four decades, trees should generally be high enough (20 to 37 feet) to reduce the line of delineation between harvested and unharvested areas as well as to intermittently break up views of road cuts and fills.

In the midground view (0.5 to 4 miles from viewer), evidence of past regeneration harvested units are similar to background views except that the viewer may not have a continuous line of sight as when viewing from the background view. The line of delineation between harvested and unharvested areas, as well as road cuts, may be interrupted due to terrain and vegetation.

In the foreground view (0 to 0.5 mile from viewer), stumps are generally still evident within four decades after harvest, particularly in drier areas, because decomposition is relatively slow under the dry and cold conditions of the Flathead National Forest. After four decades, stumps have decomposed or ground covers (shrubs) sufficiently block the visibility of the stumps. Road cuts may be long lasting and evident to the foreground viewer for longer than 40 years. The delineation between harvested and unharvested areas diminishes as young trees grow and reduce views within the harvested area.

Wildfire may soften edges created by the delineation between harvested and unharvested areas and skyline corridors; it may also burn stumps, standing trees, and logging residue such as branches and boles and thus reduce the visual effect of harvesting. However, it may also expose more roads associated with the harvested area. When reviewing harvested areas where fire occurred, the planning team utilized the web tool Google Earth to view areas post-fire and consulted with district staff knowledgeable about the areas.

After considering tree height growth, stand productivity, stand densities, time of tree regeneration, topographic features, and abundance and type of ground vegetation at different viewing distances, areas of past harvest were generally found to be substantially noticeable, on average, for at least 40 years from time of harvest. The high-contrast edges created by the harvest, associated road cuts, and evidence of mechanical harvest (such as visible stumps or skyline corridors) within these areas were the most prominent features affecting the substantially noticeable determination. As mentioned before, the effects of fire were also taken into account, and a determination was made on a case-by-case basis to determine whether an area harvested within the last 40 years was no longer substantially noticeable due to fire in the harvest area.

Key concerns from inventory process comment period

The Forest received 16 comments on the wilderness inventory process, all of which the planning team considered in the inventory process. The interdisciplinary team identified some key concerns based on the comments.

One key concern was that the effects of fire on lands that were harvested within the last 40 years were an important factor that needed to be considered. The planning team agreed, and the final identification and inventory methodology, described above, reflects this key public concern.

Another key concern was that the interdisciplinary team had excluded areas with maintenance level 2 roads (roads open for use by high-clearance vehicles). The Forest Service Handbook directs these roads to be excluded if they have been improved and are maintained by mechanical means to ensure relatively regular and continued use. Mechanical treatment of a road could include brushing, logging, or replacing culverts. The planning team reviewed these criteria again and determined that excluding level 2 roads from the inventory was appropriate because it was expected that these roads would be likely to receive some type of mechanical treatment during the life of the forest plan.

Other key concerns were related to inventoried roadless areas. One concern was that all inventoried roadless areas should be in the wilderness inventory. There is no requirement in the Forest Service Handbook (Forest Service Handbook 1909.12 chap. 70) that all inventoried roadless areas need to be included in wilderness inventories. Another concern was that the Mission Mountains Addition Inventoried Roadless Area #01504 was not included. Based on this comment, the planning team re-examined the wilderness inventory and found that a majority of the Mission Mountains Addition Inventoried Roadless Area #01504 met the criteria for wilderness inventory (after exclusion of an area with regeneration harvest). Therefore, this area was included in the wilderness inventory area and is now called North Fork Coal Creek.

Another key concern was that areas that are less than 5,000 acres and not adjacent to existing wilderness were not included in the inventory. As described in the section titled Criteria for Including Lands in the Inventory (Forest Service Handbook 1909.12 chap, 70), the planning team asked for line officer and district review of areas less than 5,000 acres outside of the wilderness inventory. This review again concluded that that no areas less than 5,000 acres were practicable to preserve and use in an unimpaired condition.

See table 4-3 for the Forest's responses to concerns expressed in wilderness inventory comments.

Table 4-3. Concerns expressed in 2014 wilderness inventory comments and the Forest's responses to concerns

No.	Concerns	Response
1	The wilderness inventory is incorrect because it included trails, which should be considered developed recreation sites. The process paper states that developed recreation sites are not included; therefore, areas with trails should not be included in the wilderness inventory.	Trails are not considered developed recreation sites; they are infrastructure. Also, there is no direction to exclude trails from the wilderness inventory.
2	The Forest did not account for the significant effect of wildfire on diminishing the degree to which logging units are or are not substantially noticeable.	Areas that had regeneration harvests since 1974 and had fire within the regeneration harvest units were reviewed by the planning team to determine whether the fire effects reduced the noticeability of the harvest areas and made them no longer substantially noticeable. The interdisciplinary team made the determination of whether those harvest areas were still substantially noticeable on a case-by-case basis. If they were determined to be not substantially noticeable, they were included in the wilderness inventory. If they were determined to be still substantially noticeable, they were excluded from the inventory. Approximately 8,800 acres were added to the wilderness inventory based on this new review by the planning team.
3	Areas within the wilderness inventory should receive a special management area prescription (e.g., wildland restoration zones or wildlands recovery areas) that would keep these areas on track and trending toward qualifying for recommendation as wilderness.	<p>The directives on wilderness evaluation indicate that lands included in the inventory provide a starting point for further evaluation; their inclusion is not a designation that conveys or requires a particular kind of management.</p> <p>All lands within the wilderness inventory were evaluated for wilderness characteristics, but not all lands within the inventory were included as recommended wilderness. The EIS analyzed various management area allocations of these lands within the wilderness inventory through alternatives, and the analysis shows the trade-offs between different management area allocations of these lands. The management area direction for lands within the inventory but not allocated to recommended wilderness (management area 1b), as well as forestwide and geographic area plan components, will then apply to guide future site-specific projects direction. Therefore, these lands will not be managed specifically to protect wilderness characteristics.</p>
4	Clarify how the scenic integrity map layer was factored into the wilderness inventory methodology.	The planning team reviewed the scenic integrity map to make sure it was consistent with the substantially noticeable areas.

No.	Concerns	Response
5	Areas that have maintenance level 2 roads should be included in the wilderness inventory. Some felt that public input should be considered, along with additional information that might warrant inclusion of some areas with unmaintained level 2 roads. Some felt that each maintenance level 2 road that contributed to exclusion of an area in the inventory should be documented. Some would like the Forest to consider the inclusion of maintenance level 2 roads that are closed to public use and are located near or adjacent to wilderness lands.	The directives allow exclusion of these roads if these roads receive some type of mechanical treatment to ensure relatively regular and continued use. The planning team reviewed this issue and concluded that maintenance level 2 roads are likely to receive some type of mechanical treatment during the life of the plan. Mechanical treatment of a road could include brushing, logging, or replacing culverts.
6	Roadless lands were omitted from the wilderness inventory, specifically Mission Mountains Addition Inventoried Roadless Area #01504, in which only the northern half contains roads and harvest areas. Some stated that all inventoried roadless areas need to be within the wilderness inventory. Some thought that inventoried roadless areas should be listed/mapped separately on the wilderness inventory to promote transparency and facilitate public comment.	<p>The planning team reviewed the wilderness inventory and found that a portion of the Mission Mountains Addition Inventoried Roadless Area #01504 met the criteria and should be included in the wilderness inventory. It is now included in the inventory and is called North Fork Coal Creek (228 acres).</p> <p>The Swan River Island Inventoried Roadless Area, which is 465 acres, was not included in the wilderness inventory because it was less than 5,000 acres and the interdisciplinary team determined that its preservation and use in an unimpaired condition was not practicable; all other inventoried roadless areas were included in the inventory if they met the methodology.</p> <p>As part of the collaborative mapping tool, a map layer of the inventoried roadless areas was available to review during the comment period.</p>
7	Many of the areas in the wilderness inventory do not meet the definition in the Wilderness Act of 1964, as many of these areas have been heavily logged and contain roads. Simply closing the roads does not mean the land is no longer undeveloped or untrammeled by humans.	The wilderness evaluation process takes a detailed look at the inventoried areas to determine whether they meet criteria for wilderness characteristics as defined in the Wilderness Act of 1964.
8	The criteria for wilderness inventory are too liberal related to human impacts such as roads and past harvest units, and the broad-brush approach includes areas that are unlikely to score well in the evaluation process.	The planning team followed the wilderness evaluation directives in Forest Service Handbook 1909.12 chap. 70. The wilderness inventory is supposed to be a broad and inclusive look at areas that will go through wilderness evaluation.
9	The Le Beau area is a research natural area that barely meets the minimum acreage of 5,000 acres to meet the intent of wilderness designation. And, wilderness designation may actually degrade the value of the research natural area from a research standpoint.	The Le Beau wilderness inventory area is over 6,000 acres and meets the other criteria outlined in the process paper for inclusion in the wilderness inventory.
10	Some of the areas in the wilderness inventory are too close to a highway and open roads and edges of active management, and those activities degrade the wilderness value and potential.	The interdisciplinary team followed the draft wilderness evaluation directives in Forest Service Handbook 1909.12 chap. 70. The wilderness inventory is intended to be broad and inclusive, based on the inventory criteria. The intent is to provide transparency about which lands are evaluated and considered for further analysis, allowing for input and feedback. During the wilderness evaluation step, the interdisciplinary team took a detailed look at the inventoried areas to determine whether they met the criteria for

No.	Concerns	Response
		wilderness characteristics as defined in the Wilderness Act of 1964.
11	The inventory excludes all areas that are smaller than 5,000 acres and are not contiguous with existing wilderness; these unroaded areas less than 5,000 acres should be included in the wilderness inventory. Some felt that if an area less than 5,000 acres in size were joined to an adjacent roadless area, its size might not be an obstacle to management to maintain the area in an unimpaired condition.	Each district ranger met with their staff to review areas less than 5,000 acres. The wilderness inventory map was reviewed, and a line officer's determination was made and documented that no areas less than 5,000 acres were practicable to preserve and use in an unimpaired condition.
12	Regarding the definition of substantially noticeable in relation to timber harvest, some felt that establishing a definitive start date (1974) is not a good approach because of the varying vegetative response; some harvested areas grow quickly and no longer are substantially noticeable within the 40 year timeframe. Others felt that any area that has had timber harvest or human manipulation should be excluded from the wilderness inventory.	The interdisciplinary team reviewed the substantially noticeable determination; other than reviewing the effects of fire on past timber harvest, the interdisciplinary team feels this determination is appropriate.
13	The Forest should expand the wilderness inventory process to address ecosystem function by including in the wilderness inventory any potentially suitable lands that serve to secure functioning habitat for migrating species and any areas that protect or facilitate the recovery of listed species.	The interdisciplinary team followed the process outlined in Forest Service Handbook 1909.12 chap. 70.
14	The wilderness inventory should include areas identified in the Northern Rocky Ecosystem Protection Act (NREPA). Some commenters also would like the wilderness bills of 1988 and 1994 mapped on the wilderness inventory.	Only wilderness bills pending before Congress are required to be mapped.
15	The visual quality objectives and standards in the 1986 forest plan were designed to mitigate degradation of scenic values; therefore, timber sales since the 1986 plan should have minimal effects on scenic values.	Visual quality objectives in the 1986 forest plan ranged from preservation to maximum modification. In timber harvest areas allocated to modification and maximum modification of visual quality, a range of timber harvest effects were allowed, many allowing delineation between harvested and unharvested stands and geometric lines that make some harvested unit substantially noticeable.
16	A substantial portion of the Bunker Creek area was not included in the wilderness inventory because there is a permanently installed linear right-of-way structure (bridge) that is being maintained in management area 11 (grizzly bear management) that is managed to provide optimum grizzly bear habitat, classified as "unsuitable" for timber, and closed to motorized recreation. Commenters proposed that all lands within the Bunker Creek grizzly bear management area should be evaluated in the wilderness inventory.	There are substantially noticeable timber harvest units in the Bunker Creek area that would have excluded the area from wilderness inventory; however, as this area was identified during the assessment phase to be included in the inventory, the interdisciplinary team included it in the wilderness inventory. A portion of the Bunker Creek area was excluded from the wilderness inventory because of the noticeable improvement of a bridge as well as other substantially noticeable regeneration units on either side of the road to the east of the bridge.

Step 2. Evaluation

The results of the wilderness evaluation process for 25 wilderness inventory areas on the Flathead National Forest follow (see figure 4-1 for a map of all areas). Each of the 25 areas in the wilderness inventory were evaluated using criteria from the Forest Service Handbook 1909.12 chap. 70. The Forest's planning team developed measures for these criteria that were developed to address the specific questions posed by the criteria and provide a consistent way to evaluate each area in the wilderness inventory. The management areas used in the evaluation are from the current 1986 forest plan.

The forest planning team developed a wilderness evaluation worksheet for each area. Each worksheet includes a map of the area, the evaluation criteria, and associated questions and measures to address the criteria.

The rest of this section presents the wilderness evaluations for the 25 wilderness inventory areas, in alphabetical order as follows:

- Beaver Lake
- Bob North
- Canyon
- Coal
- Cold Creek
- Crane Porcupine
- Demers
- Elk Creek
- Essex
- Fatty Creek
- Glacier Creek
- Hungry Horse Reservoir East
- Hungry Horse Reservoir West
- Jim Creek
- Le Beau
- Lindbergh Lake
- Meadow Lake
- North Fork Cold Creek
- Piper Creek
- Puzzle
- Sky West
- Swan Face South
- Tuchuck
- Whale
- Woodward Creek

Beaver Lake Area

A total of 3,542 acres were included in the Beaver Lake wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 98 percent lodgepole pine and subalpine fir, which are common types on the Flathead National Forest. Whitebark pine is present in the area (including whitebark pine plus trees) which is a candidate for threatened/endangered species listing by U.S. Fish and Wildlife Service.

Potential vegetation types: ~ 99 percent cool-moist and cold types, supporting typical mixed conifer forests. There may be potential for mountain hemlock, a more rare type on Flathead National Forest.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-4. Measures for 1b, Beaver Lake wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	86%
Percent of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	98%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to roads. There is a low probability of weeds within the remaining area.

Past harvest and road building is dispersed through area (490 acres). Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this

inventory area is primarily affected by natural ecological processes, including fire (~ 80 percent burned in 1919). There are long-term human-caused departures from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

The primary watershed in this area is Beaver Creek. There are no bull trout in Beaver Creek; however, westslope cutthroat trout are present in limited numbers. Invasive brook trout and central mudminnows are present.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-5. Measures for 1c, Beaver Lake wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvest occurred from the 1950s to 1973 on gentle slopes. The harvested units are fully reforested and not visible; however, the major road that bisects the area may be evident in the foreground view, and the portions on steeper slopes may be evident when viewing from the background.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting, or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.

Improvement Type	Extent of Departures
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Jocko Trail Native American Indian travel route with visible remains in and near this inventory area.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-6. Measures for 2a, Beaver Lake wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	3,453 acres (97%)
Area and percent of total available for winter nonmotorized opportunity.	200 acres (6%)

Portions of this area have outstanding opportunities for solitude due to the limited amount of open roads and trails in the inventory area. The topography consists of steep creek drainages with some rolling slopes in the southern portion of the area. An abundance of vegetation provides screening to sight and sound.

This area is surrounded by national forest system lands, with the southeastern boundary adjacent to the Lolo National Forest. Adjacent to the inventory area, on the south-facing slope of the Swan Clearwater Divide, is an area (West Fork Clearwater wilderness addition) being considered for wilderness designation under the Forest Jobs and Recreation Act. On the western boundary is the Mission Mountains Wilderness.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-7. Measures for 2b, Beaver Lake wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	2,719 acres (77%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	210 acres (6%)

Describe the types of primitive recreation activities in the area.

There are many opportunities for primitive and unconfined recreation in this inventory area. This area offers primitive recreation opportunities as there is no road or trail access; access is by cross-country travel in a remote, steep drainage. Backpacking, fishing, hunting, hiking, and viewing wildlife are some of the primitive recreation activities in this area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-8. Measures for 3a, Beaver Lake wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	2 miles (20%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and is locally, regionally, and nationally rare.	Whitebark pine is present and estimated at 300 acres. Potentially, the area could support more whitebark pine. Genetically superior whitebark pine trees have been identified and provide seed for whitebark pine tree improvement and restoration programs.
Acres and number of water howellia (listed as threatened species under the ESA) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	None.
Species richness percent of total acreage.	No acres of level 3 or 4.
Acres of key conservation areas for wolverine.	582 acres (16%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Very high lynx use, high-very high composite score for grizzly bear.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-9. Measures for 3b, Beaver Lake wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	2,086 acres (59%)
Outstanding landscapes in acres and percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	105 acres (3%)

Describe any caves or unique geologic features in the area.

Sunset Peak is 7,146 feet, which provides viewing opportunities into the Swan Valley and Clearwater drainage of the Lolo National Forest. There are no known caves present in this inventory area.

Question 3c

Are there cultural resources of historical significance in the area?

The Jocko Trail is a Native American travel route with visible remains in and near this inventory area. There was a Forest Service Lookout (Sunset Point) on the divide between the Lolo and Flathead National

Forest that was removed in 1955. Neither site has been evaluated for eligibility for the National Register of Historic Places.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports westslope cutthroat trout that are hybridized with rainbow trout. The area has been assessed for watershed conditions under the watershed condition framework. Beaver Creek is a class 2 watershed due to some impairment; class 2 watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to its natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-10. Measures for 3e, Beaver Lake wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres

Question 3f

Are there any scientific or educational features in the area?

There are no known educational features in the inventory area. Whitebark pine plus trees have been identified in this inventory area, which are important components of the whitebark pine restoration strategy and research programs at the Forest and broader level in ongoing whitebark pine restoration and research programs.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-11. Measures for 4a, Beaver Lake wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape. Southern and southeastern boundaries border Lolo National Forest. A portion of the western boundary is adjacent to the Mission Mountains Wilderness. The northern boundary follows section lines.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	Lolo National Forest MA 11C (roadless). Adjacent to land that was previously Plum Creek lands that have been harvested and contain roads.

Measures	Outcome
Describe the current management of the area.	11 miles of closed roads; 0 miles terra trails ¹¹ ; 10 miles motorized over-snow routes; 3,268 acres (92%) allow motorized over-snow use. 15% MA 1 (non-Forest lands); 5% MA 2 (unroaded lands for dispersed recreation); 79% MA 11C (grizzly bear habitat); 1% MA 12 (riparian area).
Acres and percent of total of wildland-urban interface in the area.	0 acres.
Type and extent of management restrictions within the area.	No bull trout critical habitat. 3,542 acres (100%) of critical lynx habitat. 841 acres (24%) of grizzly bear security core. 0 acres (0%) of inventoried roadless areas.

Bob North Area

A total of 88,041 acres were included in the Bob North wilderness inventory area. This area is located on the Hungry Horse-Glacier View and Spotted Bear Ranger Districts.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 86 percent subalpine fir, Douglas-fir, lodgepole pine, and western larch, which are common types on the Flathead National Forest. There is about 13 percent high-elevation sparse vegetation and avalanche chutes in this inventory area.

Potential vegetation types are cool-moist and cold types dominant, supporting typical mixed conifer types, including whitebark pine. There is a small amount of warm-dry types supporting some ponderosa pine, which is a less common type on the Forest.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-12. Measures for 1b, Bob North wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	96%
Percent of area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

No non-native or parasitic wildlife species are present. There is a low level of past harvest and associated roads (3,329 acres), mostly in stream bottoms bisecting the west side of area (Bunker, Jungle, Addition, and Tin/Soldier Creeks). Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected

by natural ecological processes, including fire (~ 40 percent burned from 1889-1929; 8 percent burned in recent fires in 2000 and 2007). There are long-term human-caused departures from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but these impact are typically scattered or in disconnected spots that are actively recovering.

Weeds are limited mostly to roads, except for large weed infestations in heavy-use areas along the South Fork River corridor. There is a low probability of weeds within most of the inventory area, except in areas adjacent to roads and weed concentrations.

There are numerous watersheds in this area; the primary ones are Bunker Creek, Spotted Bear River, and Addition Creek. There are no aquatic invasive species in this area. There are strong populations of bull trout in Bunker Creek and Spotted Bear River, and many of the smaller watersheds also support westslope cutthroat trout.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-13: Measures for 1c, Bob North wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Meadow Creek Airstrip
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	See response to 1b.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Most harvest occurred during the 1950s and 1960s, with some harvest in the mid-1970s in the Bunker Creek area. All harvested areas fully reforested and are mostly not visibly evident. There are some existing historical road templates, but they are generally not evident except for major roads (e.g., Bunker Creek, the upper end of Bent Creek) or where slopes are steeper and jammer roads exist (some units in Addition/Little and Jungle/Larch Creeks).
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	Electronic site on Stony Hill. Two repeaters on Spotted Bear Mountain. Snow course site adjacent to Spotted Bear Mountain trail.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	Jack-leg fence in the Bunker Park area.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	Meadow Creek Campground. Cedar Flats River Access.

Improvement Type	Extent of Departures
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	There is a hydro dam in Bunker Creek just downstream from this area that supplies water to Spotted Bear Ranger Station.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Spotted Bear Lookout.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-14. Measures for 2a, Bob North wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	88,030 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	68,217 acres (77%)

Portions of this area provide outstanding opportunities for solitude, especially as one moves away from Hungry Horse Reservoir. With much of the area moderately steep to very steep and ranging from heavily timbered to subalpine land forms, sights and sounds are buffered and allow for the feeling of solitude. Eighty-one percent of the area is within inventoried roadless areas (Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485). To get to the nearby Great Bear and Bob Marshall Wilderness areas, one usually travels several miles through this wilderness inventory area; some people view some of this area as part of their wilderness experience.

Solitude may be impacted along major access trails, but this is not pervasive—as one moves away from the activity, opportunities for solitude can be found. There is 1 mile of motorized over-snow vehicle route, and about 23 percent of the area allows motorized over-snow vehicle use. The Meadow Creek Airstrip is within this inventory area and is allowed within the wild and scenic river corridor of the Flathead River. This may impact opportunities for solitude, but the effects would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-15. Measures for 2b, Bob North wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and non-primitive classes for summer recreation opportunity spectrum.	78,159 acres (89%)
Acres and percent of total of primitive and non-primitive classes for winter recreation opportunity spectrum.	67,465 acres (77%)

Describe the types of primitive recreation activities in the area.

Portions of this wilderness inventory area have special importance to many people because they are adjacent to the Great Bear and Bob Marshall Wilderness areas. Primitive recreation activities in this area include horseback riding, hiking, backpacking, fishing, hunting, wildlife viewing, and cross-country skiing. There are 94 miles of nonmotorized trails¹¹ in this area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-16. Measures for 3a, Bob North wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	38 miles (14%)
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	The area contains about 240 acres of mapped whitebark pine dominance type. Many thousands of acres of potential high-elevation (> 6,000 feet) sites are suitable for whitebark pine. There are 15,451 acres of mapped whitebark pine potential vegetation type. Genetically superior whitebark pine trees have been identified in Bill Creek and provide seed for whitebark pine tree improvement and restoration programs.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	The presence of a rare plant: <i>Botrychium sp.</i> (Moonworts)
Species richness percent of total acreage.	37,403 acres (43%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	35,596 acres (40%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	8,975 acres (10%) of mountain goat habitat.
Description of coarse-scale key connectivity for various species.	Portions of this inventory area are key for wolverine and grizzly bear and moderate for lynx. There is very high radio-collared lynx use in this area. The area east of the South Fork River has lower values for all species but lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-17. Measures for 3b, Bob North wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	51,877 acres (59%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	23,854 acres (27%)

Extensive limestone caves are found in the eastern portion of this area, in the vicinity of Sergeant Mountain and Spotted Bear Mountain. The Spotted Bear country is dominated by an upwarp of the Earth's crust known as the White River Syncline. Erosion ultimately wore away the center of the syncline, leaving the tilted cliffs that face each other on either side of the South Fork of the Flathead River. Sergeant Mountain to the east and the tilted walls of Picture Ridge define the area's eastern and western boundaries. The bending of the rock strata is particularly evident at the northern end of the syncline, visible in the twisted bands of rock that make up the backbone of Sergeant Mountain. Elevation varies from 3,500 to 7,900 feet.

Question 3c

Are there cultural resources of historical significance in the area?

Spotted Bear Lookout.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-18. Measures for 3e, Bob North wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	None.

Question 3f

Are there any scientific or educational features in the area?

Exploration of the cave systems in the Spotted Bear River portion of this area has been ongoing for many years, with continued opportunities to provide both scientific and educational value. Grizzly bears use this area for summer habitat and winter denning sites. There is also opportunity to study and learn from the fire history and frequency. Whitebark pine and western larch stands have and will continue to be studied in this area. Whitebark pine plus trees have been identified, which is a feature in ongoing whitebark pine restoration and research programs.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-19. Measures for 4a, Bob North wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape. The eastern point is along the Spotted Bear River. The Bunker Creek Road is buffered out 33 feet from either side, creating a corridor that is excluded.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	The wild and scenic river designation of the Flathead River allows for the use of the Meadow Creek airstrip and adjacent campground. This area is within the inventory area.
Describe the management of adjacent lands.	MA 2b (unroaded), MA 11 (grizzly bear management), MA 13 (timberlands in mule deer and elk winter habitat), MA 21 (wilderness).
Describe the current management of the area.	13 miles of closed roads; 27 miles of decommissioned roads; 94 miles of terra trails ¹¹ (0 miles motorized; 7 miles allow mountain bikes); 1 mile of motorized over-snow vehicle routes; 19,824 acres (23%) allow motorized over-snow vehicle use. 25% MA 2 (unroaded lands for dispersed recreation); 1% MA 7 (timberlands of high scenic values); 47% MA 11A (grizzly bear habitat); 4% MA 12 or 17 (riparian habitat); 6% MA 13 (mule and elk winter habitat); 15% MA 15 or 16 (timber management); 2% MA 18 (wild and scenic river).
Acres and percent of total of wildland-urban interface in the area.	1,319 acres (< 1%).
Type and extent of management restrictions within the area.	21 miles of bull trout critical habitat (three different streams). 82,092 acres (93%) of lynx critical habitat. 71,679 acres (81%) are in the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.

Canyon Area

A total of 18,812 acres were included in the Canyon wilderness inventory area. This area is located on the Hungry Horse-Glacier View Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 90 percent subalpine fir (Douglas-fir, western larch), which are common types on the Flathead National Forest. There is about 10 percent permanent non-forest types, mainly avalanche chutes, in this inventory area.

Potential vegetation types: cool-moist and cold type most common, supporting typical mixed conifer forests. There are patches of warm-moist grand fir/cedar types in lower Haskill Basin with the potential to support western red cedar, grand fir, western hemlock, and western white pine, which are rarer types on the Flathead National Forest. In some higher-elevation areas, (> 6,000 feet), there is whitebark pine type and possibly alpine larch.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-20. Measures for 1b, Canyon wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	87%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	99%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Invasive weeds are limited to existing and decommissioned roads; there is a low probability of invasive weeds within the remaining area.

Watersheds in this area include Haskill Creek, Canyon Creek, and Big Creek. Haskill Creek is fishless at this elevation but supports pure westslope cutthroat trout in lower reaches off the Forest. Canyon Creek supports pure populations of westslope cutthroat trout but no bull trout due to a barrier falls near its confluence with the North Fork. Big Creek supports both cutthroat and bull trout, but an increasing number of cutthroat/rainbow hybrids have been found in recent years. No other aquatic invasive species are found within this area.

Numerous past harvest units (2,426 acres) and associated roads are located within and bisect the area. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 11 percent of the area burned in 1919 and 9 percent in 2001). There is some long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads (including jammer roads). Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but typically those impacts are in scattered or disconnected spots that are actively recovering.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-21. Measures for 1c, Canyon wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable. These are the non-timber harvesting treatments.	Discussed in measures for 1b, if applicable.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Mostly (70%) harvested in the 1950s and 1960s on gentle to steep slopes. These harvest units are fully revegetated to trees and shrubs and are not visible, with the exception of some of associated roads, skid trails, and jammer roads. These roads are likely visible in foreground view but not in mid- or background view.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	Micho Mine at the southwest boundary.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements such as occupancy spots or minor hunting or outfitting camps.	None.

Improvement Type	Extent of Departures
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Remains of Standard Peak Lookout.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-22. Measures for 2a, Canyon wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	18,799 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	16,483 acres (88%)

Portions of this area provide for outstanding opportunity for solitude. Forty-two percent of the inventory area is located in an inventoried roadless area (Standard Peak Inventoried Roadless Area #1129). The majority of the area is timbered and valley bottoms. There is adequate screening for solitude in the majority of the area, with sights and sounds of human activities more apparent in the southern portion of the area that is adjacent to private land comprised mostly of F. H. Stoltze Land & Lumber Co. lands and a small portion of Whitefish Mountain Resort. A portion of the area in the north and east was burned in the Moose Fire in 2001.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-23. Measures for 2b, Canyon wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	17,942 acres (95%)

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	12,038 acres (64%)

Describe the types of primitive recreation activities in the area.

The area contains the majority of the Whitefish Divide-Smokey Range National Recreation Trail. This trail offers hiking and horseback riding. The western portion of the trail has been lost in portions due to past fire. There are numerous opportunities for on-trail and off-trail hiking. Other activities include hunting, fishing, and forest product gathering. In the winter, the area is used for cross-country and backcountry skiing. Backcountry skiing is popular in the southern portion adjacent to Whitefish Mountain Resort because of the easy access from the ski area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-24. Measures for 3a, Canyon wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	8 miles (21%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally and nationally rare.	There are some whitebark pine present in the area, estimated at 25 acres of whitebark pine dominance type. There are thousands of acres that are potentially capable of supporting whitebark pine. There are about 6,300 acres of mapped whitebark pine potential vegetation type.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	May support the presence of the following minimally represented species: grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage.	5,427 acres (29%) has levels 3 or 4.
Acres of key conservation areas for wolverine.	8,648 acres (46%) very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Key for wolverines; key for grizzly bear; key for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-25. Measures for 3b, Canyon wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high scenic public value.	12,860 acres (68%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	6,775 acres (36%)

Describe any caves or unique geologic features in the area.

None.

Question 3c

Are there cultural resources of historical significance in the area?

The remains of Standard Peak Lookout are in this area.

Question 3d

Are there high-quality water resources or important watershed features in the area?

F. H. Stoltze Land & Lumber Co. diverts water from upper South Canyon Creek into Trumball Creek in dry years. This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. This area includes Haskill Basin watershed, which is the drinking water source for the City of Whitefish.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-26. Measures for 3e, Canyon wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres

Question 3f

Are there any scientific or educational features in the area?

There are no known unique scientific or educational features.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-27. Measures for 4a, Canyon wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape with boundary following some contours, roads, and buffering from harvest areas. From the northwest boundary into the interior of the area, winter motorized route #9316E is buffered 33 feet on either side to a substantially noticeable harvest area.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	No.
Describe the management of adjacent lands.	MA 3 (non-forested lands), MA 15 (timberlands), and MA 20 (Whitefish Mountain Resort).
Describe the current management of the area.	13 miles closed roads; 8 miles decommissioned roads; 10 miles terra trails ¹¹ (0 miles motorized); 14 miles motorized over-snow vehicle routes; 2,329 acres (12%) allows motorized over-snow vehicle use; 59% MA 2 (unroaded areas); 12% MA 3 (non-forested areas); 2% MA 7 (timberlands in areas of high scenic value); 4% MAs 12 or 17 (riparian areas); 2% MA 13 (timber lands in mule deer and elk winter habitat); 19% MA 15 (timberlands); 3% MA 20 (Whitefish Mountain Resort)
Acres and percent of total of wildland-urban interface in the area.	1,552 acres (8%).
Type and extent of management restrictions within the area.	2 miles of bull trout critical habitat (one stream). 18,702 acres (99%) of lynx critical habitat. 16,992 acres (90%) of grizzly bear security core. 7,893 acres (42%) of Standard Peak Inventoried Roadless Area #1129.

Coal Area

A total of 67,181 acres were included in the Coal wilderness inventory area. This area is located on the Hungry Horse-Glacier View Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 87 percent subalpine fir (Douglas-fir, western larch), which are common types on the Flathead National Forest. About 9 percent sparse vegetation and shrubs, mainly in avalanche chutes. There is about 3 percent whitebark pine dominance type.

Potential vegetation types: cool-moist and cold types dominate, supporting typical mixed coniferous forest types. There is a considerable amount of areas in cold, higher-elevation sites that are capable of supporting whitebark pine, a more rare type.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS of the proposed action lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-28. Measures for 1b, Coal wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	90%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to roads. There is a low probability of weeds within most of the remaining area, except within recent burn area. Heavy weed concentration exists along the southeast edge, adjacent to and within the inventoried area.

Watersheds within this area include Big, Coal, Moran, Hay, and Red Meadow Creeks. These watersheds contain both pure and hybridized populations of westslope cutthroat trout and bull trout. Rainbow trout and hybrids are the only aquatic invasive species found in these watersheds.

Numerous past harvest units (6,635 acres) and associated roads are concentrated along streams that bisect the area and in the upper basins. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 40 percent of the area burned 1919-1929 and 25 percent in 2001). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-29. Measures for 1c, Coal wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable. These are the non-timber harvesting treatments.	Discussed in measures for 1b, if applicable.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Most (~ 80%) of the harvest occurred from the 1950s through the 1970s, predominantly on gentle to moderate slopes. These harvest units are densely stocked with trees and shrubs, and are not visible. Some associated roads templates may be noticeable in foreground views but are likely not evident from mid- or background views except within the recent burn area, where old road templates and jammer logging roads are visibly evident.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements such as occupancy spots or minor hunting or outfitting camps.	Some dispersed camping sites exist.

Improvement Type	Extent of Departures
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Remains of three historic lookouts on Coal Ridge, including Coal Ridge cabin; and China Basin cabin. None of these sites have been evaluated for eligibility for the National Register of Historic Places.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-30. Measures for 2a, Coal wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	67,121 acres (100%)
Area and percent of total available for winter nonmotorized opportunity.	59,786 acres (89%)

Portions of this area provide for outstanding opportunity for solitude. The sights and sounds of human activities and improvements are screened well by the topography or do not have impact due to distance. About 65 percent of the area is within three inventoried roadless areas (Benchmark Inventoried Roadless Area #1126, Coal Ridge Inventoried Roadless Area #1127, and Deadhorse Inventoried Roadless Area #1128).

The eastern boundary is close to the North Fork Road, and in some places the boundary is adjacent to private land with residential homes, which might reduce opportunities for solitude, but the effects would not be pervasive. The area boundary is adjacent to the Coal Creek State Forest to the east.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-31. Measures for 2b, Coal wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	60,794 acres (90%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	34,839 acres (52%)

Describe the types of primitive recreation activities in the area.

Primitive recreation activities in the area include hiking, backpacking, horseback riding, fishing, hunting, forest product gathering, cross-country skiing, and backcountry skiing. The Pacific Northwest National Scenic Trail passes through the northern part of the area (trails #3 and #26). The western boundary of the area is along the Whitefish Divide, with the Ralph Thayer National Recreation Trail (Trail #26) running along it north to south. Other ridgetop trail experiences exist on Coal Ridge and Moose Peak.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-32. Measures for 3a, Coal wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	23 miles (14%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There is a large amount of existing whitebark pine dominance type, estimated at 2,000 acres, with many 1000s more acres potentially able to support whitebark pine. Large amount of higher elevation sites, suitable for whitebark pine - approximately 24,000 acres of mapped whitebark pine potential vegetation type. Genetically superior whitebark pine trees on Moose Peak have been identified and provide seed for whitebark pine tree improvement and restoration programs.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	Presence of a rare plant: <i>Botrychium sp.</i> (moonworts).
Species richness percent of total acreage.	26,006 acres (39%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	35,023 acres (52%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	All key for wolverines <i>except</i> for the area south of Coal Creek State Forest; moderate for grizzly bear; low for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-33. Measures for 3b, Coal wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high scenic public value.	30,350 acres (45%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	22,719 acres (34%)

Describe any caves or unique geologic features in the area.

There are no known caves in the area. The Whitefish Divide makes up the western boundary of the area, and Moose Peak (7,531 feet) is on the southern boundary and Moran Peak (7,404 feet) on the northern. The area includes higher-elevation ridgelines and the upper reaches and small tributaries of Hay, Moran, Coal, and Hallowat Creeks. A few pockets of small pothole lakes exist in a few of the upper basins along the Whitefish Divide.

Question 3c

Are there cultural resources of historical significance in the area?

There are the remains of three historic lookouts on Coal Ridge. Coal Ridge Cabin is periodically worked on for stabilization reasons. The remains of the China Basin Cabin and an old trapper's cabin are located along the Whitefish Divide in the top of China Basin.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-34. Measures for 3e, Coal wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	None,

Question 3f

Are there any scientific or educational features in the area?

There are no known significant educational features in the area. Whitebark pine plus trees have been identified in this area, which is a feature in ongoing whitebark pine restoration and research programs.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-35. Measures for 4a, Coal wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	The area is irregular in shape. A portion of the eastern boundary is the Coal Creek State Forest and follows the state forest boundary lines, which are straight lines. The upper northeastern boundary is adjacent to private land. The northern boundary follows the boundaries of old harvest units. There are numerous nodes in this inventory area due to excluding open roads. The western boundary follows the Kootenai National Forest/Flathead National Forest boundary line.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	Kootenai National Forest, management area 3 (non-forested lands), MA 15 (timberlands).
Describe the current management of the area.	4 miles of seasonally open road (part of roads #1691 and 1693, to be decommissioned); 16 miles of closed roads; 43 miles of decommissioned or historical roads; 50 miles of terra trails ¹¹ (0 miles motorized); 22 miles of motorized over-snow vehicle routes; 7,395 acres (11%) allows motorized over-snow vehicle use. 56% MA 2 (unroaded lands for dispersed recreation); 8% MA 3 (non-forested lands); 8% MA 12 or 17 (riparian habitat); 27% MA 15 or 16 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	1,556 acres (2%).
Type and extent of management restrictions within the area.	9 miles of bull trout critical habitat (six streams). 67,107 acres (100%) of lynx critical habitat. 59,115 acres (88%) of grizzly bear security core. 6,218 acres (9%) of Benchmark Inventoried Roadless Area #1126. 13,997 acres (21%) of Coal Ridge Inventoried Roadless Area #1127. 23,319 acres (35%) of Deadhorse Inventoried Roadless Area #1128. A total of 65% (43,534 acres) are in inventoried roadless areas.

Cold Creek Area

A total of 674 acres were included in the Cold Creek wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation types: 100 percent subalpine fir, and western larch (Douglas-Fir), which are common types on the Flathead National Forest.

Potential vegetation types: ~ 100 percent cool-moist types. A small portion on the west side is > 6,000 feet in elevation and has the potential for whitebark pine.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-36. Measures for 1b, Cold Creek wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	64%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	96%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to roads. There is a low probability of weeds within most of the area.

Numerous past harvest units (240 acres) are spread throughout a relatively large portion of the area. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes. No known major fire has occurred in the area in the past 120 years.

There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but these impacts are typically scattered or in disconnected spots that are actively recovering.

The primary watershed in this area is Cold Creek. Invasive rainbow trout and brook trout are present. Bull trout and westslope cutthroat trout are also present.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-37. Measures for 1c, Cold Creek wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1b.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvest occurred in 1957, 1970-74, and 1987 (with three harvest units in 1987). Most of the older harvests were on gentle slopes except for the 1987 harvests. The earlier harvests units are not visible. Both the 1987 and 1974 clearcuts, are substantially noticeable, especially on steeper slopes.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.

Improvement Type	Extent of Departures
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-38. Measures for 2a, Cold Creek wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	659 acres (98%)
Area and percent of total available for winter nonmotorized opportunity	186 acres (28%)

This area provides outstanding opportunities for solitude. All roads within the inventory area are closed yearlong, and the area is adjacent to the Mission Mountains Wilderness. About 14 percent of this inventory area is within the Mission Addition #01505 Inventoried Roadless Area. Topography elevation ranges from approximately 6,000 feet in the southwest corner to approximately 4,800 feet down in the Cold Creek drainage, resulting in steep slopes that provide buffering of sound. There are also large amounts of vegetation to provide screening to sight and sound. About 72 percent of the area is open to motorized over-snow vehicle use, which might reduce opportunities for solitude but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-39. Measures for 2b, Cold Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	357 acres (53%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	7 acres (1%)

Describe the types of primitive recreation activities in the area.

Primitive recreation activities are available, such as hiking, camping, backpacking, snowshoeing, and fishing.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-40. Measures for 3a, Cold Creek wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout	1 mile (51%)
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	Small amount of potential habitat for whitebark pine.
Acres and number of water howellia (listed as a threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	None.
Species richness percent of total acreage.	No acres of levels 3 or 4.
Acres of key conservation areas for wolverine.	3 acres (< 1%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Key for wolverines; key for grizzly bear; n/a for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-41. Measures for 3b, Cold Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	474 acres (70%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72 75,	0 acres

Describe any caves or unique geologic features in the area.

There are no known caves are present in the inventory area. There is one large wetland or bog located in the southwest portion of the inventory area.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and hybridized westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. Cold Creek is a class 2 watershed; class 2 watersheds have some degree of impairment and exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-42. Measures for 3e, Cold Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	None.

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features located within the inventory area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-43. Measures for 4a, Cold Creek wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape. Western boundary and portion of northern boundary are adjacent to the Mission Mountains Wilderness.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 15 (timberlands) and MA 22 (Mission Mountains Wilderness). Adjacent to lands previously owned by Plum Creek lands that were harvested and roaded.
Describe the current management of the area.	4 miles of closed roads; 0 miles of terra trails ¹¹ ; 4 miles of motorized over-snow vehicle routes; 488 acres (72%) allow motorized over-snow vehicle use. 100% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	0 acres.
Type and extent of management restrictions within the area.	1 mile of bull trout critical habitat (one stream). 674 acres (100%) of lynx critical habitat. 96 acres (14%) of grizzly bear security core. 94 acres (14%) in the Mission Addition Inventoried Roadless Area #01505.

Crane Porcupine Area

A total of 5,338 acres were included in the Crane Porcupine wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 99 percent lodgepole pine, western larch, Douglas-fir, and subalpine fir, which are common types on the Flathead National Forest.

Potential vegetation types: cool-moist type, supporting typical mixed conifer forest types. The elevation extends down to about 3,800 feet, and warm-moist grand fir, western red cedar, western hemlock, and western white pine potential vegetation types occupy much of these areas, supporting typical mixed conifer forest types.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-44. Measures for 1b, Crane Porcupine wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	79%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	98%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	99%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to roads. There is a low probability of weeds within the remaining area.

There are numerous past harvest area across nearly 20 percent of the area (1,112 acres). Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, although past fire suppression has probably influenced current vegetation conditions in some areas (~ 50 percent of the area burned in 1919; no recent fire). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

The primary stream in this area is Porcupine Creek. Invasive brook trout are present, and there are no bull trout or westslope cutthroat in this area.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-45. Measures for 1c, Crane Porcupine wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvest occurred in the 1950s to early 1970s on gentle to steep slopes. Harvest areas are fully reforested. Associated historical road templates and skid trails/jammer roads may be visible in foreground views, especially in steeper units.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.

Improvement Type	Extent of Departures
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-46. Measures for 2a, Crane Porcupine wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	5,297 acres (99%)
Area and percent of total available for winter nonmotorized opportunity.	8 acres (0%)

This area provides very high opportunities for solitude, with many of the roads on Forest Service lands closed yearlong. The topography consists of rolling slopes and an abundance of vegetation that provides buffering of sound and sights. Motorized over-snow vehicle use is allowed on 100 percent of the area and may reduce opportunities for solitude during the winter. There are 11 miles of groomed motorized over-snow vehicle routes within the area. The area is close to private lands near the southeast shore of Swan Lake; there may be noise from motor boats on Swan Lake, but it would not be pervasive. The Flathead Indian Reservation borders much of the western boundary.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-47. Measures for 2b, Crane Porcupine wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	4,985 acres (93%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	0 acres (0%)

Describe the types of primitive recreation activities in the area.

The area provides opportunities for primitive recreation such as cross-country hiking, wildlife viewing, hunting, and fishing. There are no trails within the inventory area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-48. Measures for 3a, Crane Porcupine wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	None.
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally and nationally rare.	No known existing whitebark pine dominance type. The area in the south half above 6,000 feet potentially could support whitebark pine.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	Minimally represented species: may support the presence of grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage.	No acres of levels 3 or 4.
Acres of key conservation areas for wolverine.	1 acre (< 1%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Moderate-high for lynx; high for connectivity between Mission and Swan Ranges.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-49. Measures for 3b, Crane Porcupine wilderness inventory area

Measures	Outcome
Acres and percent of total of distinctive scenic classes 1 and 2, which have a high public value.	4,074 acres (76%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	0 acres

Describe any caves or unique geologic features in the area.

There are no known caves or unique geologic features in the area.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

Brook trout is the only salmonid present. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-50. Measures for 3e, Crane Porcupine wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	None.

Question 3f

Are there any scientific or educational features in the area?

None.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-51. Measures for 4a, Crane Porcupine wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular configuration. Tribal lands adjacent to the western boundary. Boundary follows old harvest units and roads.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 15 (timberlands); tribal lands.
Describe the current management of the area.	< 1 mile of seasonally open road (part of NFS Road 498 to be decommissioned); 10.5 miles of closed roads; 7 miles of decommissioned or historical roads; 11 miles of motorized over-snow vehicle routes; 5,328 acres (100%) allow motorized over-snow vehicle use. 100% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	155 acres (3%).
Type and extent of management restrictions within the area.	No bull trout critical habitat. 4,831 acres (90%) of lynx critical habitat. 3,184 acres (60%) of grizzly bear security core. 0% in inventoried roadless area.

Demers Area

A total of 6,959 acres were included in the Demers wilderness inventory area. This area is located on the Hungry Horse-Glacier View Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

The existing vegetation dominance types is 99 percent lodgepole (Douglas-fir, western larch) in the area, which are common types on the Flathead National Forest. Potential vegetation types: 90 percent cool-moist type, supporting mostly lodgepole pine.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-52. Measures for 1b, Demers wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	84%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to roads and small areas adjacent to roads (trailheads, gravel pits). There is a high potential for weeds within the area due to recent severe fire and warm-dry vegetation types.

The west side of this area drains into Langford Creek and into Swamp Creek, which is a tributary to Coal Creek. There is a small degree of hybridization of westslope cutthroat trout with rainbow trout in Langford Creek. Swamp Creek supports pure westslope cutthroat trout. Bull trout are not present in these streams. There are no other aquatic invasive species in these watersheds.

Past harvested areas total 1,130 acres. There was a high-severity fire in 2001 that killed more than 90 percent of the trees. Very little harvest took place prior to the fire; salvage of fire-killed trees accounts for nearly all the harvest area. Fire severity and effects are largely considered natural, except in some areas of the southwest aspect where pre-fire forests were mature, uneven-aged Douglas-fir (ponderosa pine) on warm-dry sites. Fire suppression likely influenced pre-fire forest density and fuel loadings.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-53. Measures for 1c, Demers wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Mostly post fire-salvage with no associated roads, gentle slopes, and not visibly evident.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Remains of Demers Ridge Lookout. This site has not been evaluated for eligibility for the National Register of Historic Places.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-54. Measures for 2a, Demers wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	6,955 acres (100%)
Area and percent of total available for winter nonmotorized opportunity.	6,851 acres (98%)

Portions of this area provide outstanding opportunities for solitude, particularly as one moves away from the North Fork Road. This inventory area is adjacent to private land with residential structures, to the Coal Creek State Forest, and to the North Fork Road. The entire area was burned during the 2003 Roberts Fire. The sights and sounds of human habitation and activities are somewhat apparent on the North Fork Road and on the Camas Road heading in to Glacier National Park, but the impacts would not be pervasive. About 2 percent of the area allows motorized over-snow vehicle use.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-55. Measures for 2b, Demers wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	4,096 acres (59%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	0 acres (0%)

Describe the types of primitive recreation activities in the area.

Primitive recreation activities in the area include hiking, horseback riding, forest product gathering, and hunting. Trails in the area are limited to Trails #266 and #381, which all go to or loop off of Glacier View Mountain. Winter use includes cross-country and/or backcountry skiing.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-56. Measures for 3a, Demers wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	2 miles (6%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There is no whitebark pine dominance type within the area and very small area of potential whitebark pine habitat.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.

Measures	Outcome
Minimally represented or rare species/vegetation types in region.	Presence of a rare plant: <i>Corydalis sempervirens</i> (pale corydalis)
Species richness percent of total acreage.	No acres with levels 3 or 4.
Acres of key conservation areas for wolverine.	52 acres (1%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Low-moderate for wolverines; moderate for grizzly bear; low for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-57. Measures for 3b, Demers wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high scenic public value.	6,253 acres (90%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	664 acres (10%)

Describe any caves or unique geologic features in the area.

No known cave or unique geologic features are in the area.

Question 3c

Are there cultural resources of historical significance in the area?

Remains of Demers Ridge Lookout.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-58. Measures for 3e, Demers wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	None.

Question 3f

Are there any scientific or educational features in the area?

No known significant scientific or educational features.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-59. Measures for 4a, Demers wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape. The northern boundary is adjacent to private land and adjacent to the Coal Creek State Forest. The eastern boundary is adjacent to the North Fork Road. The western boundary is adjacent to NFS Road 317.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	Coal Creek State Forest, MA 15 (timberlands), MA 18 (Flathead wild and scenic river), MA 12 (riparian), and MA 9 (timberlands and whitetail deer habitat).
Describe the current management of the area.	< 1 mile of historical roads; 10 miles of terra trails ¹¹ (0 miles motorized); 0 miles of motorized over-snow vehicle routes; 108 acres (2%) allow motorized over-snow vehicle use. 26% MA 2 (unroaded lands); 22% MA 9 or 13 (timberlands whitetail deer, mule deer and elk habitat); 5% MA 12 (riparian); 47% MA 15 or 16 (timberlands); 1% MA 18 Flathead wild and scenic river).
Acres and percent of total of wildland-urban interface in the area.	2,989 acres (43%).
Type and extent of management restrictions within the area.	1 mile of bull trout critical habitat (one stream). 6,106 acres (88%) of lynx critical habitat. 4,689 acres (67%) of grizzly bear security core. 0% in inventoried roadless area.

Elk Creek Area

A total of 7,733 acres were included in the Elk Creek wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 96 percent lodgepole pine, Douglas-fir, western larch, and subalpine fir, which are common types on the Flathead National Forest. There are some hardwood types in the bottom of Windfall Creek.

Potential vegetation types: ~ 90 percent cool-moist types, supporting typical mixed conifer forests. Elevation within inventory area extends down to 4,200 feet in Elk Creek and 4,100 feet in the south end (Windfall and Hemlock Creeks). Warm-moist potential vegetation types exist in these lower elevations, mostly grand fir types, with potential to support western hemlock and western white pine and currently supporting mixed conifer forests. There is some cedar potential vegetation type in the south half also, but it is unknown whether cedar currently occurs on these sites. Much of this type is within the recent fire area, so there is likely no existing cedar there at present.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-60. Measures for 1b, Elk Creek wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	77%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	97%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to roads. There is a low probability of weeds within the area.

There is a substantial amount of past harvest (1,799 acres), mostly concentrated in the south half of the area and within the 2003 burn area. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 70 percent burned in 1919 and 50 percent burned in 2003). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

The primary watersheds in this area are Elk Creek and Kraft Creek. Elk Creek is the most important bull trout spawning stream on the Flathead National Forest and also supports westslope cutthroat trout. Kraft Creek supports westslope cutthroat trout, brook trout, and some bull trout.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-61. Measures for 1c, Elk Creek wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvest occurred from the 1960s to 2005 (the latter was post-fire salvage) and was concentrated in the south half of the area. Legacy lands (previously Plum Creek Timber Co. lands) are present and had both pre- and post-fire harvesting activities. Harvest units are not visible. There are many existing roads in the south part of the area and, in many cases, the road template is exposed by fire. These road templates may be visible in foreground view, with some portions likely evident from mid- or background views.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.

Improvement Type	Extent of Departures
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	The Red Butte fish barrier is a large concrete fish barrier on Red Butte Creek.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-62. Measures for 2a, Elk Creek wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	7,588 acres (98%)
Area and percent of total available for winter nonmotorized opportunity.	5,597 acres (72%)

Portions of this inventory area provide for outstanding opportunity for solitude, mainly in the northern portion. In the southern portion of this area, opportunities for solitude are influenced by the sight and sounds of the Kraft Creek NFS Road 56. Users in the southern portion of this inventory area may experience the sights and sounds of road use, but this is not pervasive use. This road is a popular route to the Glacier Creek Trailhead. Vegetative screening is limited in the southern section because of the Crazy Horse Fire (2003) and provides limited buffers to sound and sight. The area is about 1 mile away from private lands and some residential buildings.

Motorized over-snow vehicle use is allowed on 28 percent of the area, and there are 25 miles of motorized over-snow vehicle routes. This might reduce opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-63. Measures for 2b, Elk Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	3,977 acres (51%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	4,274 acres (55%)

Describe the types of primitive recreation activities in the area.

Elk, Windfall, Hemlock, Frenchy, and Red Butte Creeks offer opportunities for primitive recreation activities such fishing, paddling, hiking, backpacking, snowshoeing, and possibly backcountry skiing in this area. Trails #607, #515, and #301 offer hiking opportunities.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-64. Measures for 3a, Elk Creek wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	14 miles (46%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There is no known existing whitebark pine dominance type; there is a small region above 6,000 feet in elevation where whitebark pine may potentially occur.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	Includes three unoccupied ponds (< 1 acre); part of 1 unoccupied pond (< 1acre); and part of Windfall Creek fen (approximately 1 acre).
Minimally represented or rare species/vegetation types in region.	The presence of the rare plant <i>Lycopodium inundatum</i> (Northern Bog Clubmoss). Minimally represented species: May support the presence of Grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage.	147 acres (2%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	154 acres (2%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	Negligible (< 1 acre (0%) of habitat.
Description of coarse-scale key connectivity for various species.	The central portion is key for grizzly bear—the rest is low, to mostly low for wolverine and low for lynx. Refer to the maps in the cited works. Species—stronghold for grizzly bear (threatened and endangered), wolverine (proposed threatened and endangered), Rocky Mountain tailed frog stronghold (species in decline), heavy elk use (potential species of public interest), mountain goat (potential species of public interest), and western toad (potential species of public interest).

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, caves, or other geologic features?

Table 4-65. Measures for 3b, Elk Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	4,784 acres (62%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types map 17, 54, 55, 72, and 75.	1,541 acres (20%)

Describe any caves or unique geologic features in the area.

There are no known caves or unique geological features in the area.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-66. Measures for 3e, Elk Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features in this area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-67. Measures for 4a, Elk Creek wilderness inventory area

Measures for 4a	Outcome
Describe the shape and configuration of the area.	Irregular in shape. The western boundary is contiguous to the Mission Mountains Wilderness. The northeastern boundary follows section lines that were formerly Plum Creek Timber Co. lands. The southeastern boundary follows old harvest units.

Measures for 4a	Outcome
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 22 (Mission Mountains Wilderness), MA 15c (timberlands).
Describe the current management of the area.	0.3 miles of open yearlong roads (NFS Road 561F to be decommissioned); 24.5 miles of closed roads; 0.3 miles of decommissioned roads; 6 miles terra trails ¹¹ (0 miles motorized); 25 miles motorized over-snow vehicle routes; 2,137 acres (28% allow motorized over-snow vehicle use. 6% MA 1 (non-Forest lands); 93% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	563 acres (7%).
Type and extent of management restrictions within the area.	4 miles of bull trout critical habitat (one stream). 7,733 acres (100%) of critical lynx habitat. 3,808 acres (49%) of grizzly bear security core. 132 acres (< 1%) are within the Mission Mountains Addition #01506 Inventoried Roadless Area.

Essex Area

A total of 23,025 acres were included in the Essex wilderness inventory area. This area is located on the Hungry Horse-Glacier View Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 88 percent Douglas-fir, lodgepole pine, subalpine fir, and western larch, which are common types on the Flathead National Forest; about 11 percent sparsely vegetated, high-elevation lands, including avalanche chutes, in this area; there are some hardwood types along areas near the Middle Fork of the Flathead River.

Potential vegetation types: mostly cool-moist types, supporting typical mixed conifer forest types. There is a substantial amount of cold sites, with elevations extending up to 7,200 feet, supporting whitebark pine above about 6,000 feet elevation (and perhaps some mountain hemlock also in the Dickey Creek area). Some patches of warm-moist types in lower Moccasin Creek have the potential to support grand fir, western hemlock, cedar, and western white pine.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-68. Measures for 1b, Essex wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	92%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

The brown-headed cowbird is the only non-native or parasitic wildlife species present. Weeds are mostly limited to roads and areas of concentrated use along U.S. Highway 2, with the exception of a large concentration of known infestations in the Essex area. There is a moderate to high probability of weeds in areas adjacent to Essex and other known weed concentrations; there is a low probability of weeds elsewhere.

There are numerous watersheds within this area; most are too steep to support a significant fish population with the exception of Tunnel, Dickey, and Essex Creeks. Bull trout are not present in these watershed but exist immediately downstream in the Middle Fork of the Flathead River. Westslope cutthroat trout are present throughout the area with pure populations. Brook trout is the primary invader and occurs in Moccasin, Great Bear, Devil, and Geifer Creeks. A small degree of hybridization from rainbow trout with westslope cutthroat trout can also be found throughout the area.

Past harvest units (1,756 acres) that are concentrated in stream bottoms of the central and southern half of the area and in the Pinnacle area. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 50 percent of the area burned 1910-1929). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-69. Measures for 1c, Essex wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Most harvest occurred in the 1960s on gentle slopes. These harvest areas are fully revegetated and are not visible. Many of the historical road templates are largely not noticeable, except perhaps in steeper portions of the Pinnacle area.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.

Improvement Type	Extent of Departures
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-70. Measures for 2a, Essex wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	22,994 acres (100%)
Area and percent of total available for winter nonmotorized opportunity.	8,080 acres (35%)

Portions of this inventory area provide outstanding opportunities for solitude; especially as one moves away from the U.S. Highway 2 corridor and move upslope. Interspersed private lands are adjacent to the majority of the eastern boundary. The U.S. Highway 2 corridor (railroad and highway) is adjacent to this area. The western boundary is adjacent to the Great Bear Wilderness. About 72 percent of the area is within an inventoried roadless area (Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #01506).

There are 2 miles of motorized over-snow routes, and 65 percent of the area allows motorized over-snow vehicle use. Opportunities for solitude in the winter might be reduced by motorized over-snow vehicle use, but it would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-71. Measures for 2b, Essex wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	14,240 acres (62%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	7,271 acres (32%)

Describe the types of primitive recreation activities in the area.

Primitive recreation opportunities in the area include hiking, backpacking, horseback riding, fishing, hunting, cross-country skiing, and backcountry skiing. The area is increasingly popular for backcountry skiing in the winter due to the terrain and easy access from U.S. Highway 2. There are 19 miles of trails within the area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-72. Measures for 3a, Essex wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout	23 miles (29%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There is little known existing whitebark pine dominance type. There are several hundred acres of whitebark pine potential vegetation type and high-elevation, sparsely vegetated exposed sites that are favored by whitebark pine.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	Presence of the following rare plants: <i>Botrychium</i> sp. (moonworts), <i>Solorina spongiosa</i> (fringed chocolate chip lichen), <i>Dicranella grevilleana</i> (Greville's dicranella moss), <i>Papaver pygmaeum</i> (alpine glacier poppy), and <i>Corydalis sempervirens</i> (pale corydalis). Minimally represented species: May support the presence of grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage.	3,750 acres (16%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	3,942 acres (17%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	811 acres (4%) of mountain goat habitat.
Description of coarse-scale key connectivity for various species.	Key for wolverines, key for mountain goat, and key for grizzly bear; a portion is low for lynx and a portion is high for lynx. Radio-collared lynx crossed U.S. Highway 2 from Geifer Creek west to Essex Creek.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-73. Measures for 3b, Essex wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	13,378 acres (58%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	1,297 acres (6%)

Describe any caves or unique geologic features in the area.

There are no known cave resources or unique geologic features in the area.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-74. Measures for 3e, Essex wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres

Question 3d

Are there high-quality water resources or important watershed features in the area?

There is a community water source that is drawn from Essex Creek in this area. This area supports bull trout in the Middle Fork and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3f

Are there any scientific or educational features in the area?

There are no known significant scientific or educational features in the area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-75. Measures for 4a, Essex wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape. Interspersed private lands on the eastern boundary, which is adjacent to U.S. Highway 2. Western and southern boundaries are adjacent to the Great Bear Wilderness.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	Great Bear Wilderness (MA 21), MA 13a (non-forested, mule deer and elk winter habitat).
Describe the current management of the area.	2 miles of closed roads; 4 miles of decommissioned or historical roads; 19 miles of terra trails ¹¹ (2 miles motorized); 2 miles of motorized over-snow vehicle routes; 14,942 acres (65%) allow motorized over-snow vehicle use. 38% MA 2 (unroaded); 1% MA 4 (developed recreation sites); 12% MA 5, 7, or 8 (high scenic value); 9% MA 12 or 17 (riparian habitat); 3% MA 13 (timberlands, mule and elk winter habitat); 29% MA 15 or 16 (timberlands); 8% MA 18 (Flathead Wild and Scenic River).
Acres and percent of total of wildland-urban interface in the area.	18,197 acres (79%).
Type and extent of management restrictions within the area.	6 miles of bull trout critical habitat (two different streams/rivers). 22,729 acres (99%) of lynx critical habitat. 13,463 acres (58%) grizzly security core. 16,531 acres (72%) of Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #01506.

Fatty Creek Area

A total of 4,963 acres were included in the Fatty Creek wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

There is about 94 percent subalpine fir, lodgepole pine (western larch, ponderosa pine) in the area. About 4 percent of the area is cedar stands, with many stands likely in mature/old forest, a relatively rare type on the Flathead National Forest.

Potential vegetation types: ~ 70 percent cool-moist, supporting typical mixed conifer forests. The elevation extends down to about 4,100 feet in Cedar and Fatty Creeks, and the lower elevations are warm-moist cedar potential vegetation type (30 percent of the area), capable of supporting western red cedar as well as grand fir, western hemlock, and western white pine.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-76. Measures for 1b, Fatty Creek wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	80%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	99%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to roads, with a low probability of weed within most of the area. There is a large area of past harvest in the north part of the Fatty Creek drainage area (993 acres), with associated roads and numerous skid trails (especially on

previous Plum Creek Timber Co. lands). Forest composition, structure, and patterns in the harvest areas has been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes; including fire (~ 60 percent burned in 1910 and/or 1934; no recent fire). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

The main watersheds in this area are Fatty Creek and Cedar Creek. These two creeks primary support invasive brook trout and some westslope cutthroat trout in the headwaters. An occasional bull trout is also captured.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-77. Measures for 1c, Fatty Creek wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvest occurred in 1955 and 1970, with some harvest in 1978 on legacy lands (previously Plum Creek Timber Co. lands). Most harvest was on gentle slopes. The harvested areas are fully reforested. Most of the harvested areas and roads or skid trails are not visible. The exception is the 1978 harvest (~ 200 acres in section 9), where harvest is noticeable to some extent and numerous skid trails are still evident in the foreground view.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.

Improvement Type	Extent of Departures
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-78. Measures for 2a, Fatty Creek wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	4,957 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	2,454 acres (49%)

Portions of this inventory area provide outstanding opportunities for solitude in this area. The topography of the area consists of steep creek drainages that buffer sound. There is an abundance of vegetation providing screening to sight and sound. About 7 percent of the area is within an inventoried roadless area (Mission Mountains Addition Inventoried Roadless Area #01501). There are portions of the inventory area that are adjacent to the Swan River State Forest and may be affected by the sights and sounds of harvesting, but this would not be pervasive. Fatty Creek NFS Road 10381 is buffered out of the inventory area but might still influence opportunities for solitude within the area, but the effects would not be pervasive.

There are about 9 miles of motorized over-snow vehicle routes, and 51 percent of the area is open to motorized over-snow vehicle use in the inventory area, which could have some influence on opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-79. Measures for 2b, Fatty Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	2,774 acres (56%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	328 acres (7%)

Describe the types of primitive recreation activities in the area.

The types of primitive recreation in this area consist of hiking, backpacking, snowshoeing, and exploring portions of the inventory area. The area is close to communities and easily accessible, containing the closest trailhead into the Mission Mountains Wilderness.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-80. Measures for 3a, Fatty Creek wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	2 miles (12%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There are no known existing whitebark pine dominance type in the area. There are several hundred acres above 6,000 feet in elevation that could potentially support whitebark pine.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	Includes Fatty Creek Fen (0.74 acres).
Minimally represented or rare species/vegetation types in region.	Presence of a rare plant: <i>Scheuchzeria palustris</i> (pod grass). Minimally represented species: May support the presence of grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage.	6 acres (< 1%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	267 acres (5%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	11 acres (< 1%) of mountain goat habitat.
Description of coarse-scale key connectivity for various species.	High connectivity for wolverines between the Mission and Swan Ranges, key for grizzly bear, and n/a for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-81. Measures for 3b, Fatty Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value	2,552 acres (51%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	266 acres (5%)

Describe any caves or unique geologic features in the area.

There are no known caves or unique geologic features present in the inventory area.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports brook trout and some westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-82. Measures for 3e, Fatty Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features in the inventory area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-83. Measures for 4a, Fatty Creek wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular in shape. The western boundary is adjacent to the Mission Mountains Wilderness and follows section lines. The northern tier is an entire section and follows section lines. The eastern boundary is adjacent to past harvest units and open roads.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 22 (wilderness), MA 15 (timberlands), MA 2 (unroaded). Adjacent to the Swan River State Forest.

Measures	Outcome
Describe the current management of the area.	<p>9 miles of closed roads; < 1 mile of terra trails¹¹ (0 miles motorized); 9 miles of motorized over-snow vehicle routes; 2,509 acres (51%) allow motorized over-snow vehicle use.</p> <p>36% MA 2 (unroaded); 64% MA 15 (timberlands).</p>
Acres and percent of total of wildland-urban interface in the area.	19 acres (< 1%).
Type and extent of management restrictions within the area.	<p>No bull trout critical habitat.</p> <p>4,963 acres (100%) of lynx critical habitat.</p> <p>2,708 acres (55%) of grizzly bear security core.</p> <p>327 acres (7%) of Mission Mountains Addition #01501 Inventoried Roadless Area.</p>

Glacier Creek Area

A total of 2,590 acres were included in the Glacier Creek wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 95 percent western larch and lodgepole pine (Douglas-fir), which are common types on the Flathead National Forest. Potential vegetation types: 98 percent cool-moist types, supporting mixed conifer forests typical of the types.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-84. Measures for 1b, Glacier Creek wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	97%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	99%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

The brown-headed cowbird is the only non-native or parasitic wildlife species present. Weeds are limited to roads within and surrounding the area and in small concentrations adjacent to roads within the area. There is a low to moderate probability of weeds in other portions of the area.

The primary stream in this area is Glacier Creek, which supports invasive brook trout.

There are past harvest units (90 acres), along with associated roads and skid trails. Forest composition, structure, and patterns in the harvest areas have been influenced by past human actions. The current

vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 87 percent of the area burned in 1919 and 5 percent in 2003). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-85. Measures for 1c, Glacier Creek wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Limited harvesting occurred, mostly in 1960 and 1965, along the west edge, and is now densely stocked with trees. Harvest units and roads/skid trails are not visible with the exception of the 1989 clearcut unit (17 acres) in the north part of the area and associated roads, which are substantially noticeable.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.

Improvement Type	Extent of Departures
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-86. Measures for 2a, Glacier Creek wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	2,573 acres (99%)
Area and percent of total available for winter nonmotorized opportunity.	1,885 acres (73%)

Portions of this area provide outstanding opportunities for solitude. There is an abundance of vegetation providing screening to sight on the slope. Glacier Slough Trail #481 is located within the inventory area and is a moderately used trail. Lindbergh Lake is about 1 to 1.5 miles away, and NFS Road 561 is close to the northern and western boundaries. Opportunities for solitude could be reduced by the proximity of motor boats on Lindbergh Lake and NFS Road 561, but the effects would not be pervasive.

There is 1 mile of motorized over-snow vehicle routes, and about 27 percent of the area is open for motorized over-snow vehicle use, which might reduce opportunities for solitude but would not be a pervasive impact.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-87. Measures for 2b, Glacier Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	494 acres (19%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	1,783 acres (69%)

Describe the types of primitive recreation activities in the area.

Primitive recreation activities include bird watching, nature wildlife viewing, camping, hiking, and snowshoeing.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-88. Measures for 3a, Glacier Creek wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	6 miles (74%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	No existing known whitebark pine and no potential whitebark pine habitat.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	None.
Species richness percent of total acreage.	41 acres (2%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	None.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Key for grizzly bear; low for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-89. Measures for 3b, Glacier Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	1,833 acres (71%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	0 acres

Describe any caves or unique geologic features in the area.

Glacier Slough is a unique botanical feature located within this inventory area. This large wetland area and associated adjacent forest was rated to be of “outstanding significance” by the Montana Natural Heritage Program. The slough is also considered a proposed special area in the forest plan and a proposed eligible wild and scenic river.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area primarily supports brook trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-90. Measures for 3e, Glacier Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	None.

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features are located within this inventory area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-91. Measures for 4a, Glacier Creek wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape. A small portion of the southwest boundary is adjacent to the Mission Mountains Wilderness. The northern boundary follows NFS Road 561. The eastern boundary is adjacent to past harvest units and also follows section lines.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 15c (timberlands, white-tailed deer summer range), MA 1 (non-forested), MA 2A (unroaded for dispersed recreation), MA 7 (timberlands with high scenic value), MA 22 (Mission Mountains Wilderness). Past Plum Creek Timber Co. land is adjacent to the eastern boundary and is heavily roaded and harvested.

Measures	Outcome
Describe the current management of the area.	<p>3 miles of closed roads; 1 mile of terra trails¹¹ (0 miles motorized); 1 mile of motorized over-snow routes; 705 acres (27%) allow motorized over-snow.</p> <p>67% MA 2 (unroaded for dispersed recreation); 7% MA 7 (timberlands with high scenic value); 7% MA 12 (riparian habitat); 20% MA 15 (timberlands).</p>
Acres and percent of total of wildland-urban interface in the area.	13 acres (< 1%).
Type and extent of management restrictions within the area.	<p>No bull trout critical habitat.</p> <p>2,590 acres (100%) of lynx critical habitat.</p> <p>0 acres of grizzly bear security core.</p> <p>0% in inventoried roadless area.</p>

Hungry Horse Reservoir East Area

A total of 36,935 acres were included in the Hungry Horse Reservoir East wilderness inventory area. This area is located on the Spotted Bear and Hungry Horse-Glacier View Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 78 percent Douglas-fir, subalpine fir, western larch, and lodgepole pine, which are common types on the Flathead National Forest. About 20 percent is high-elevation, sparse-vegetation types, supporting whitebark pine in some areas.

Potential vegetation types: cool-moist and cold types dominate, supporting typical mixed conifer forests. There are some smaller pockets of warm-dry types (ponderosa pine/Douglas-fir) and warm-moist grand fir types in the area. There is no substantial ponderosa pine or western red cedar in the area.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-92. Measures for 1b, Hungry Horse Reservoir East wilderness area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	90%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	99%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. There are past harvest units on 3,878 acres as well as associated roads and skid trails in the area along the western edge of the area, and these include areas of concentrated harvest activity. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 60 percent of the area burned 1903-

1929). There are substantial areas that were burned by prescribed fire from 1998 to 2014 to create a more diverse forest structure, improve habitat and whitebark pine regeneration, and reduce fuel loadings. There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

There are weeds present along most roads within and adjacent to the area, especially a large concentration in the Murray Creek/Deep Creek area. There is a moderate probability of weeds within the area, particularly near roads.

This area contains numerous watersheds. There are no bull trout populations within the area, and westslope cutthroat trout are abundant and populations are pure. There are no aquatic invasive species within this area.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-93. Measures for 1c, Hungry Horse Reservoir East wilderness area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Most harvest occurred in the 1950s and 1960s on gentle slopes. These harvest areas are now densely stocked with trees and shrubs and are not visible. In most cases, the associated historical road templates and skid trails are not evident from the mid- or background view, nor are those on gentle slopes. A few areas (e.g., Emery, Margaret, Tiger, Unawah, and Deadhorse Creeks) have units on steep slopes, where some road templates are still visible in the foreground view.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	Baptiste Lookout houses the Forest Service Baptiste radio repeater.
Areas of historic mining where impacts are not substantially noticeable.	Baptiste Mine.
Areas of mining activity where impacts are not substantially noticeable.	Baptiste Mine.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.

Improvement Type	Extent of Departures
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Baptiste Lookout, which is staffed in the summer months.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-94. Measures for 2a, Hungry Horse Reservoir East wilderness area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	36,873 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	22,283 acres (60%)

Portions of the inventory area provide outstanding opportunities for solitude. The majority of the eastern boundary is adjacent to the Great Bear Wilderness. Topography and vegetation provide screening to sights and sounds. About 75 percent of the area is within an inventoried roadless area (Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485). As one moves downslope towards Hungry Horse Reservoir, there may be more sights and sounds from the reservoir and Hungry Horse Road that may be pervasive during peak summertime use. The very northern portion of the area is adjacent to U.S. Highway 2 and to a private airstrip (Ryan Field). There are 4 miles of motorized over-snow vehicle routes, and 40 percent of the area is open to motorized over-snow vehicle use, which might reduce opportunities for solitude but would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-95. Measures for 2b, Hungry Horse Reservoir East wilderness area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive classes for summer recreation opportunity spectrum.	30,691 acres (83%)
Acres and percent of total of primitive and semiprimitive classes for winter recreation opportunity spectrum.	21,822 acres (59%)

Describe the types of primitive recreation activities in the area.

Primitive recreation opportunities in the area include hiking, backpacking, horseback riding, fishing, hunting, and gathering forest products such as huckleberries. Winter recreation opportunities include cross-country skiing, snowshoeing, and backcountry skiing. There are 15 miles of nonmotorized trails for hiking and horseback riding.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-96. Measures for 3a, Hungry Horse Reservoir East wilderness area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	15 miles (16%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There is about 300 acres of mapped existing whitebark pine dominance type in this area. A substantial area is > 6,000 feet, extending up to 7,400 feet in elevation, which is suitable and favorable habitat for whitebark pine. About 1,300 acres are mapped whitebark pine potential vegetation type. Genetically superior whitebark pine trees have been identified on Desert Mountain and provide seed for whitebark pine tree improvement and restoration programs.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	One unoccupied pond, 0.8 acres.
Minimally represented or rare species/vegetation types in region.	Presence of two rare plants: <i>Botrychium</i> sp. (moonworts) and <i>Mimulus ampliatus</i> (stalk-leaved monkeyflower). Minimally represented species: May support the presence of grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage.	10,398 acres (28%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	11,749 acres (32%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	1,955 acres (5%) of mountain goat habitat.
Description of coarse-scale key connectivity for various species.	Low-high for wolverine; moderate for grizzly bear; and moderate for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-97. Measures for 3b, Hungry Horse Reservoir East wilderness area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	32,973 acres (89%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	5,733 acres (16%)

Describe any caves or unique geologic features in the area.

There are no known cave resources or unique geologic features within the area.

Question 3c

Are there cultural resources of historical significance in the area?

Baptiste Lookout.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout in Hungry Horse Reservoir and pure westslope cutthroat trout throughout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-98. Measures for 3e, Hungry Horse Reservoir East wilderness area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres

Question 3f

Are there any scientific or educational features in the area?

Whitebark pine plus trees have been identified, which are a feature in ongoing whitebark pine restoration and research programs.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-99. Measures for 4a, Hungry Horse Reservoir East wilderness area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape. Long and narrow adjacent to the eastern boundary to the Great Bear Wilderness. Portions of the western boundary are adjacent to previously harvested areas and roads.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 21 (Great Bear Wilderness) is adjacent to the inventory area. MA 15 (timber lands) have previously harvested areas and roads. To the north are private lands with residential homes and a private airstrip (Ryan Field).
Describe the current management of the area.	8 miles of closed roads; 25 miles of decommissioned or historical roads; 15 miles of terra trails ¹¹ (0 miles motorized); 4 miles of motorized over-snow vehicle routes; 14,652 acres (40%) allow motorized over-snow vehicle use. 1% MA 1 (non-forested); 33% MA 2 (unroaded); 7% MA 12 or 17 (riparian habitat); 24% MA 13 (timberlands and mule deer and elk winter habitat; 34% MA 15 or 16 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	3,537 acres (10%).
Type and extent of management restrictions within the area.	No bull trout critical habitat. 35,991 acres (97%) of lynx critical habitat. 29,548 acres (80%) of grizzly bear security core. 27,565 acres (75%) of Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.

Hungry Horse Reservoir West Area

A total of 178,435 acres were included in the Hungry Horse Reservoir West wilderness inventory area. This area is located on the Hungry Horse-Glacier View, Spotted Bear and Swan Lake Ranger Districts.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 85 percent subalpine fir, Douglas-fir, western larch, and lodgepole pine, which are common types on the Flathead National Forest. About 15 percent of the area is in high-elevation sparse vegetation and avalanche chutes.

Potential vegetation types: cool-moist and cold types dominate, supporting typical mixed conifer forests. There are substantial areas of warm-moist grand fir, cedar, western hemlock, and western white pine types, as well as warm-dry Douglas-fir/ponderosa pine types in lower elevations facing into the Flathead Valley (west side of the inventory area).

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-100. Measures for 1b, Hungry Horse Reservoir West wilderness area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	92%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

The Brown-headed cowbird at survey point in southwest portion of area is the only non-native or parasitic wildlife species present. Past harvest units (15,131 acres), are throughout area in lower and mid elevations, with several relatively small areas of concentrated past harvest activity. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current

vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 20 percent of area burned 1910-1929; ~ 11 percent burned in recent fires, most in 2003). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or disconnected spots that are actively recovering.

There are weeds present along most roads. There is a low probability of weeds within most of the remaining area, which are remote, moist and cold sites with the exception of areas adjacent to the Flathead Valley, where weed infestations on private lands exist.

There are numerous watersheds within this area. There are no aquatic invasive species. Bull trout are present in Wounded Buck, Sullivan, Quintonkon, and Bunker Creeks. Pure westslope cutthroat trout exist throughout the area.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-101. Measures for 1c, Hungry Horse Reservoir West wilderness area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Most harvesting occurred in the 1950s and 1960s, mostly on gentle slopes in the bottom of drainages. These are fully reforested and not visibly except for some of the associated road templates and skid trails/jammer roads. These are noticeable in the foreground in some areas (e.g., Connor Creek) and are less evident in mid- or background views. The exception is in recently burned areas (Quintonkon and Sullivan Creeks), where fire has exposed existing and historical road templates. The majority of road templates in some areas (especially on steeper slopes) are evident on the landscape.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	Mount Aeneas electronic site on the edge of the Jewel Basin.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.

Improvement Type	Extent of Departures
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Historical Native American travel corridor through the Jewel Basin and near Sullivan Creek; Pioneer and Battery Mountain Lookout remains; existing Trinkus Forest Service guard station; remains of Crevice Forest Service guard station. None of these sites have been evaluated for eligibility for the National Register of Historic Places.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-102. Measures for 2a, Hungry Horse Reservoir West wilderness area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	177,604 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	40,477 acres (23%)

There are portions of this inventory area that provide for outstanding opportunities for solitude, especially as one leaves the western boundary, as almost the entire western boundary of the area is adjacent to private land. In this area, the sights of human activities and settlements to the west might reduce opportunities for solitude but would not be pervasive. About 79 percent of the area is with an inventoried roadless area (Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485).

The Jewel Basin Hiking Area is in a portion of this inventory area and has been managed as wilderness, therefore providing outstanding opportunities for solitude. Some mainline trails have high use, but there are many opportunities for solitude off mainline trails.

In the winter, there are 67 miles of motorized over-snow vehicle routes, and about 77 percent of the inventory area is open to motorized over-snow vehicle use. This might reduce opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-103. Measures for 2b, Hungry Horse Reservoir West wilderness area

Measures	Outcome
Acres and percent of total of primitive and non-primitive classes for summer recreation opportunity spectrum.	136,896 acres (77%)
Acres and percent of total of primitive and non-primitive classes for winter recreation opportunity spectrum.	39,953 acres (22%)

Primitive recreation opportunities in the area include hiking, backpacking, horseback riding, hunting, fishing, forest product gathering, cross-country skiing, snowshoeing, and backcountry skiing. There are numerous alpine lakes in this area, mostly in the Jewel Basin Hiking Area, that offer recreation opportunities in an alpine lake environment. This area also offers hiking and horseback riding along almost the entire Swan Crest on Trail #7. There are 223 miles of terra trails¹¹ (132 miles of nonmotorized use).

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-104. Measures for 3a, Hungry Horse Reservoir West wilderness area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	71 miles (14%).
Acres of whitebark pine whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	Although there are only 300 acres of mapped existing whitebark pine in this area, many thousands of acres of the area are potentially capable of supporting whitebark pine, and there is also a substantial amount of high, sparsely vegetated, harsh sites that are favored by whitebark pine. The area has nearly 20,000 acres of mapped whitebark pine potential vegetation type. Genetically superior whitebark pine plus trees have been identified in the head end of Beta/Doris Creek and provide seed for whitebark pine tree improvement and restoration programs.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.

Measures	Outcome
Minimally represented or rare species/vegetation types in region.	Presence of the following rare plants: <i>Callicladium haldanianum</i> (callicladium moss), <i>Epipactis gigantea</i> (giant helleborine), <i>Collema curtisporum</i> (jelly lichen), <i>Lobaria hallii</i> (a lichen), <i>Cypripedium parviflorum</i> (small yellow lady's slipper), <i>Aloina brevirostris</i> (aloina moss), <i>Ambloyodon dealbatus</i> (ambloyodon moss), <i>Castilleja cervina</i> (deer Indian paintbrush), <i>Asplenium trichomanes</i> (maidenhair spleenwort), and <i>Lathyrus bijugatus</i> (latah tule pea). Minimally represented species: May support the presence of grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage.	33,678 acres (19%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	86,229 acres (48%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	8,445 acres (5%) of mountain goat habitat.
Description of coarse-scale key connectivity for various species.	A portion is key for wolverines; high for grizzly bear; Noisy Creek to north end of reservoir high for lynx; southern portion has high radio-collared lynx use.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-105. Measures for 3b, Hungry Horse Reservoir West wilderness area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	134,327 acres (75%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	54,962 acres (31%)

Describe any caves or unique geologic features in the area.

No known cave resources exist within the area. The Jewel Basin Hiking Area is within this inventory area and has outstanding alpine scenery.

Question 3c

Are there cultural resources of historical significance in the area?

There is a historic Native American travel corridor through the Jewel Basin and near Sullivan Creek. The remains of Pioneer and Battery Mountain Lookouts are located in the area. There are also the existing Trinkus Forest Service guard station and the remains of the Crevice Forest Service guard station.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-106. Measures for 3e, Hungry Horse Reservoir West wilderness area

Measure	Outcome
Acres and percent of total of special areas or research natural areas.	Jewel Basin Hiking Area, 15,356 acres (9%)

Question 3f

Are there any scientific or educational features in the area?

Whitebark pine plus trees identified, which is a feature in ongoing whitebark pine restoration and research programs.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-107. Measures for 4a, Hungry Horse Reservoir West wilderness area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shaped area. Thirteen roads are not included within the area; they have a 33-foot buffer on either side of the road that create linear exclusions in the area.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 15 (timberlands), private lands.

Measures	Outcome
Describe the current management of the area.	<p>71 miles of closed roads; 31 miles of decommissioned or historical roads; 223 miles terra trails¹¹ (91 miles motorized); 67 miles over-snow routes; 137,958 acres (77%) allow motorized over-snow.</p> <p>1% MA 1 (non-forested lands); 36% MA 2 (unroaded); 7% MA 3 (non-forested); 5% MA 7 (timberlands in high scenic value); 11% MA 11C (grizzly bear); 4% MA 12 or 17 (riparian); 5% MA 13 (timberlands in mule deer and elk winter habitat); 21% MA 15 or 16 (timberlands); 9% MA 19 (Jewel Basin Hiking Area).</p>
Acres and percent of total of wildland-urban interface in the area.	31,209 acres (17%).
Type and extent of management restrictions within the area.	<p>14 miles of bull trout critical habitat (three different streams).</p> <p>174,796 acres (98%) of lynx critical habitat.</p> <p>121,863 acres (68%) of grizzly bear security core.</p> <p>141,624 acres (79%) of Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.</p>

Jim Creek Area

A total of 1,509 acres were included in the Jim Creek wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 98 percent subalpine fir, Douglas-fir, and western larch (lodgepole pine), which are common types on the Flathead National Forest.

Potential vegetation types: ~ 60 percent cool-moist and cold types, supporting mixed conifer forests typical of these types. In the south half there is 38 percent warm-moist, primarily cedar vegetation type that likely supports forests that contain cedar, and possibly large, old cedar in riparian areas, a relatively rare type on the Flathead National Forest. The potential also exists for grand fir, western hemlock, and western white pine.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-108. Measures for 1b, Jim Creek wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	93%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	99%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to roads. All roads surrounding the area have known infestations. There is a moderate probability of weeds within the area.

Portions of the area have past harvest (112 acres), associated road building, and skid trails. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes. There have been no known major fires in the past 120 years. There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

The primary stream in this area is Jim Creek, which supports bull trout, westslope cutthroat trout, and invasive brook trout.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-109. Measures for 1c, Jim Creek wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Clearcut/seedtree harvests occurred from 1987 to 2000 in the area, all of which are substantially noticeable. Some are small areas or slivers along the boundary of the area, but two units are larger and within the area.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.

Improvement Type	Extent of Departures
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-110. Measures for 2a, Jim Creek wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	1,497 acres (99%)
Area and percent of total available for winter nonmotorized opportunity.	106 acres (7%)

Portions of this area provide for outstanding opportunities for solitude. The area lends itself to solitude in the summer due to the limited amount of roads in the inventory area; roads that are located within the inventory area are closed yearlong. About 3 percent of the area is within the Mission Mountains Addition Inventoried Roadless Area #01503. The northern section is adjacent to the Mission Mountains Wilderness. There is an abundance of vegetation providing screening to sight.

The northeastern boundary is about 0.5 mile from private lands with residential structures. There are 2 miles of motorized over-snow vehicle routes, and about 93 percent of the area allows motorized over-snow vehicle use. This could reduce opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-111. Measures for 2b, Jim Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	181 acres (12%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	0 acres (0%)

Describe the types of primitive recreation activities in the area.

Primitive recreation opportunities include hiking, wildlife viewing, backpacking, snowshoeing, backcountry skiing, and camping.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystem for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-112. Measures for 3a, Jim Creek wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	1 mile (36%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	No known existing whitebark pine dominance type. A small area (~ 200 acres) could potentially support whitebark pine, regions > 6,000 feet in elevation.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	Minimally represented species: May support the presence of grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage.	67 acres (5%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	308 acres (20%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	High connectivity for wolverines between the Mission and Swan Ranges; key for grizzly bear; not applicable for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-113. Measures for 3b, Jim Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	1,182 acres (78%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	32 acres (2%)

Describe any caves or unique geologic features in the area.

There are no known caves or unique geologic features within the inventory area.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. Class 2 watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. Jim Creek has been rated as a class 2 watershed due to some impairment.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-114. Measures for 3e, Jim Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres (0%)

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features in the inventory area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-115. Measures for 4a, Jim Creek wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular and narrow in shape. Western boundary is adjacent to the Mission Mountains Wilderness. Southern and northern boundaries follow past harvest units and section lines. Eastern boundary follows section line.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 22 (Mission Mountains Wilderness), MA 15 (timberlands). About 0.5 mile from the eastern boundary are private lands with residences.
Describe the current management of the area.	2 miles of closed roads; 2 miles of motorized over-snow vehicle routes; 1,403 acres (93%) allow motorized over-snow vehicle use; 9% MA 1 (non-Forest lands); 2% MA 12 (riparian); 89% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	4 acres (< 1%).

Measures	Outcome
Type and extent of management restrictions within the area.	1 mile of bull trout critical habitat (1 stream). 1,509 acres (100%) of lynx critical habitat 152 acres (10%) of grizzly security core. 46 acres (3%) of Mission Mountains Addition Inventoried Roadless Area #01503.

Le Beau Area

A total of 6,340 acres were included in the Le Beau wilderness inventory area. This area is located on the Tally Lake District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 97 percent Douglas-fir, and western larch, which are common types on the Flathead National Forest. There is a small amount of dry type (ponderosa pine). Potential vegetation types: 58 percent warm-moist types, capable of supporting cedar, but the presence and amount of cedar on these sites is unknown. The potential also exists for grand fir, western hemlock, and western white pine.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-116: Measures for 1b, Le Beau wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	96%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. There is a low amount of past harvest and road building (272 acres). Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire, and there may be some influence on forest conditions due to fire suppression. There are no known major fires in the past 120 years. There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads,

including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

Non-native invasive species are limited to roads. There is a low probability of weeds within the remaining area due to the remote, moist, and cold sites.

The only stream in the area is Le Beau Creek. The only trout species present is brook trout. There are no other aquatic invasive species.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-117. Measures for 1c, Le Beau wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Past harvest on very gentle slope, limited roads, fully reforested, not visible.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	Bonneville powerline just barely comes into the area in section 15.
Areas of historical mining where impacts are not substantially noticeable.	Not present.
Areas of mining activity where impacts are not substantially noticeable.	Not present.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	Not present.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	Finger Lake trailhead is right on the boundary in section 23.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	Bonneville powerline just barely comes into the area in section 15.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	No past watershed treatments are in this area.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation when that considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-118: Measures for 2a, Le Beau wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	6,335 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	5,590 acres (88%)

The majority of this inventory area provides outstanding opportunities for solitude. About 98 percent of the area is within an inventoried roadless area (Le Beau Inventoried Roadless Area). The topography of the Le Beau area is characterized by ridgetops and cliffs formed by glacial scouring. The northeastern corner of the inventory is adjacent to private lands; the mainline of Burlington Northern Railroad is less than 0.25 mile away, as well as U.S. Highway 93. The combination of topography and vegetation allows for a high degree of screening and diminishes the noise from U.S. Highway 93 on the northern boundary and the Burlington Northern Railroad. On the eastern boundary, the Stillwater State Forest and Upper Stillwater Campground are close to the inventory area, which might reduce opportunities for solitude, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-119: Measures for 2b, Le Beau wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive classes for summer recreation opportunity spectrum.	5,242 acres (83%)
Acres and percent of total of primitive and semiprimitive classes for winter recreation opportunity spectrum.	5,668 acres (89%)

Describe the types of primitive recreation activities in the area.

Two nonmotorized trails exist in the area and receive moderate use. Finger Lake receives moderate day use in summer, with swimming and cliff jumping, and ice fishing use in winter. Fire Lakes and Lagoni Lake receive low use. Most of the area is broken terrain without trails, which limits use in the interior of the area. Camping, hiking, fishing, and hunting opportunities exist in the area. There is no winter motorized over-snow vehicle use on the Flathead National Forest in this area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-120: Measures for 3a, Le Beau wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	2 miles (9%)
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	No known or potential whitebark pine sites.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	Includes Toad and Lagoni Lake fens (13 acres).
Minimally represented or rare species/vegetation types in region.	The presence of two rare plants: <i>Dryopteris cristata</i> (crested shieldfern), <i>Scheuchzeria palustris</i> (pod grass). Minimally represented species: May support the presence of grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage.	No acres of levels 3 or 4.
Acres of key conservation areas for wolverine.	None.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Not applicable for wolverine; high for grizzly bear; not applicable for mountain goat; moderate connectivity for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, caves or geologic features?

Table 4-121: Measures for 3b, Le Beau wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	3,664 acres (58%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	0 acres (0%)

Describe any caves or unique geologic features in the area.

This area has obvious evidence of glacial activity, with glacial grooves and striations on cliffs and exposed ridgetops in the area. There is a large amount of limestone bedrock in the drainages. Large canyons in the area are often bordered by rock cliffs of sandstone, mudstone, and limestone. The highest point in the area is Ketowke Mountain at 5,635 feet on the western boundary.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area only supports brook trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-122: Measures for 3e, Le Beau wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	The Le Beau Research Natural Area is 5,709 acres, with 401 acres on the Kootenai National Forest and 5,308 acres on the Flathead National Forest. Eighty-four percent of the inventory area on the Flathead National Forest is composed of the Le Beau Research Natural Area.

Question 3f

Are there any scientific or educational features in the area?

Le Beau Research Natural Area contains three habitat types targeted for representation: Abies grandis/Clintonia uniflora, Thuja plicata/Clintonia uniflora, and Picea/Clintonia uniflora.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-123: Measures for 4a, Le Beau wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	The shape and configuration is a solid oblong with small nodes on the eastern boundary. The eastern boundary of the area is adjacent to the Stillwater State Forest; the northern end of the eastern boundary is adjacent to private land and the Burlington Northern Railroad. U.S. Highway 93 is within 0.5 mile. The northwestern and western boundaries are adjacent to the Kootenai National Forest.
Describe any legally established rights or uses within the area.	The establishment of the Le Beau Research Natural Area establishment requested that the research natural area land be removed from mineral entry.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	Half the area is adjacent to the Kootenai National Forest.

Measures	Outcome
Describe the current management of the area.	<p>2 miles of closed roads; 3 miles of terra trails¹¹ (0 miles motorized); 1 mile of motorized over-snow vehicle routes; 750 acres (12%) allow motorized over-snow vehicle use.</p> <p>5% MA 2 (unroaded lands); 75% MA 3A (research natural areas); 12% MA 12 or 17 (riparian); 7% MA 15 (timberlands).</p>
Acres and percent of total of wildland-urban interface in the area.	2,187 acres (34%).
Type and extent of management restrictions within the area.	<p>This area is not within the Northern Continental Divide Ecosystem.</p> <p>24 acres of bull trout critical habitat (part of Upper Stillwater Lake).</p> <p>5,219 acres (82%) of critical lynx habitat.</p> <p>6,210 acres (98%) is in the Le Beau Inventoried Roadless Area.</p>

Lindbergh Lake Area

A total of 1,019 acres were included in the Lindbergh Lake wilderness area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 96 percent Douglas-fir, and lodgepole pine, which are common types on the Flathead National Forest. Potential vegetation types: cool-moist types, supporting typical mixed conifer forests.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-124. Measures for 1b, Lindbergh Lake wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	94%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	99%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to roads. There is a low probability of weeds within the area.

There is a low amount of past harvest (62 acres) and road building. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area primarily affected by natural ecological processes, including fire (~ 66 percent burned in 1919; no recent fires). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units,

there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

The primary watersheds in this area are Lindbergh Lake and Beaver Creek. Lindbergh Lake has recently been invaded by lake trout, and Beaver Creek supports brook trout.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-125. Measures for 1c, Lindbergh Lake wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	A small amount of harvest has occurred, mostly in the early 1970s, except for one unit in 2000. Harvest occurred on gentle slopes and the ridgetop along the southeast boundary of the area. The 1970s units are fully reforested and not visible. The 2000 unit is substantially noticeable.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-126. Measures for 2a, Lindbergh Lake wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	1,012 acres (99%)
Area and percent of total available for winter nonmotorized opportunity	749 acres (74%)

Portions of this area provide very high opportunities for solitude. The area is heavily wooded and steep, buffering some sights and sounds of Lindbergh Lake. The very north boundary is adjacent to private property with numerous residents. The western boundary is adjacent to Lindbergh Lake. There is a probability of hearing motor boats and residential noise during the summer.

There is 1 mile of motorized over-snow vehicle routes, and about 27 percent of the area allows motorized over-snow vehicle use, which might reduce opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-127. Measures for 2b, Lindbergh Lake wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	441 acres (43%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	442 acres (43%)

Describe the types of primitive recreation activities in the area.

Primitive activities include hiking, fishing, camping, hunting, and wildlife viewing. The area is heavily wooded and steep sloped. There are 3 miles of terra trails.¹¹

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-128. Measures for 3a, Lindbergh Lake wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	< 1 mile (< 1%).

Measures	Outcome
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	No known existing whitebark pine and no potential whitebark pine habitat.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	None.
Species richness percent of total acreage.	159 acres (16%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	None.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Not applicable for wolverines; key for grizzly bear; not applicable for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-129. Measures for 3b, Lindbergh Lake wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	730 acres (72%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	0 acres (0%)

Describe any caves or unique geologic features in the area.

There are no known caves in the inventory area.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and westslope cutthroat trout in Lindbergh Lake. The area has been assessed for watershed conditions under the watershed condition framework. Class 2 watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. Beaver Creek is a class 2 watershed due to some impairment.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-130. Measures for 3e, Lindbergh Lake wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres (0%)

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features in the inventory area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-131. Measures for 4a, Lindbergh Lake wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape. A portion of the western boundary is adjacent to Lindbergh Lake and a portion is adjacent to the Mission Mountains Wilderness. The eastern boundary follows past harvest units.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 2 (unroaded lands), MA 15 (timberlands), MA 11C (grizzly bear habitat), MA 22 (Mission Mountains Wilderness).
Describe the current management of the area.	1 mile of closed roads; 3 miles of terra trails ¹¹ (0 miles motorized); 1 mile of motorized over-snow vehicle routes; 270 acres (27%) allow motorized over-snow vehicle use. 43% MA 2 (unroaded lands); 1% MA 12 (riparian); 55% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	159 acres (16%).
Type and extent of management restrictions within the area.	8 acres of bull trout critical habitat (part of Lindbergh Lake). 1,019 acres (100%) of lynx critical habitat. 513 acres (50%) of grizzly bear security core. 0% of inventoried roadless area.

Meadow Lake Area

A total of 1,033 acres were included in the Meadow Lake wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 99 percent western larch, and Douglas-fir; which are common types on the Flathead National Forest. Potential vegetation types: cool-moist types, supporting mixed conifer forests typical of this type.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-132. Measures for 1b, Meadow Lake wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	82%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	0%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Past harvests, road building, and skid trails have occurred on 183 acres. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 6 percent burned in 2008). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering. There is a low probability of weeds within the area.

This area primarily contains Lindbergh Lake, which has recently been invaded by lake trout. Bull trout and westslope cutthroat trout are present.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-133. Measures for 1c, Meadow Lake wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvest occurred in 1953, on very gentle slopes, densely stocked with trees and fully recovered. Not visibly evident in fore-, mid-, or background views.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-134. Measures for 2a, Meadow Lake wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	1,033 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	587 acres (57%)

Portions of this inventory area provide very high opportunities for solitude. The southern boundary is adjacent to the Mission Mountains Wilderness. The eastern boundary is adjacent to Lindbergh Lake. As one gets closer to the lake, the sounds of motor boats and residential noise during the summer months might reduce opportunities for solitude, but the impacts would not be pervasive. About 43 percent of the area is open to motorized over-snow vehicle use, which might reduce opportunities solitude during the winter but would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-135. Measures for 2b, Meadow Lake wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and non-primitive classes for summer recreation opportunity spectrum.	420 acres (41%)
Acres and percent of total of primitive and non-primitive classes for winter recreation opportunity spectrum.	601 acres (58%)

Describe the types of primitive recreation activities in the area.

Primitive activities include hiking, fishing, hunting, and wildlife viewing. There is 1 mile of hiking and biking trail in the area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-136. Measures for 3a, Meadow Lake wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	1 mile (79%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There is no known existing whitebark pine and no potential whitebark pine habitat.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.

Measures	Outcome
Minimally represented or rare species/vegetation types in region.	None.
Species richness percent of total acreage.	< 1 acre (< 1%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	None.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Low for wolverines; key for grizzly bear; not applicable for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-137. Measures for 3b, Meadow Lake wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	733 acres (71%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	0 acres (0%)

Describe any caves or unique geologic features in the area.

There are no known caves or unique geological features in the inventory area. Views consist of Lindbergh Lake and the Swan Range.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout in Lindbergh Lake. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-138. Measures for 3e, Meadow Lake wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres (0%)

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features in the inventory area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-139. Measures for 4a, Meadow Lake wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Rectangular in shape; eastern boundary borders Lindbergh Lake. Southern boundary is adjacent to the Mission Mountains Wilderness.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 2 (unroaded lands), MA 5 (roaded timberlands with high scenic value), MA 12 (riparian), MA 15 (timberlands).
Describe the current management of the area.	< 1 mile of closed roads; 1 mile of terra trails ¹¹ (0 miles motorized); < 1 mile of motorized over-snow vehicle routes; 446 acres (43%) allow motorized over-snow vehicle use. 35% MA 2 (unroaded lands); 37% MA 5 (roaded timberlands of high scenic value); 2% MA 12 (riparian); 26% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	181 acres (18%).
Type and extent of management restrictions within the area.	1 acre of bull trout critical habitat (part of Lindbergh Lake). 1,033 acres (100%) of lynx critical habitat. 667 acres (65%) of grizzly bear core. 0% in inventoried roadless area.

North Fork Cold Creek Area

A total of 445 acres were included in the North Fork Cold Creek wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 99 percent western larch, subalpine fir, and Douglas-fir, which are common types on the Flathead National Forest. Potential vegetation types: 99 percent cool-moist types, which is the most common type on the Flathead National Forest and supports a typical diversity of coniferous forest types.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-140. Measures for 1b, North Fork Cold Creek area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	47%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	98%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Past harvests have occurred across half of the area (237 acres). Roads and skid trails are present from harvesting. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this area is primarily affected by natural ecological processes. There has been no known major fire in the past 120 years. There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be

lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

Weeds are limited to roads. There is a moderate probability of weeds in the remaining area.

The main stream in this area is North Cold Creek, which supports hybridized cutthroat trout.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-141. Measures for 1c, North Fork Cold Creek area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvests occurred in the 1960s and 1980s on gentle slopes; densely reforested. Harvested areas are not visible.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-142. Measures for 2a, North Fork Cold Creek area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	445 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	118 acres (27%)

Portions of this area provide outstanding opportunities for solitude. The topography consists of very steep slopes down to the North Fork of Cold Creek. About 26 percent of the area is within an inventoried roadless area (Mission Mountains Addition Inventoried Roadless Area #01504). Opportunities for solitude in the summer might be reduced by NFS Road 9599 (which is buffered out 33 feet on either side, creating a linear exclusion in the inventory area), but the impacts would not be pervasive. The inventory area is open to motorized over-snow vehicle use (73 percent), which might reduce opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-143. Measures for 2b, North Fork Cold Creek area

Measures	Outcome
Acres and percent of total of primitive and non-primitive classes for summer recreation opportunity spectrum.	2 acres (0%)
Acres and percent of total of primitive and non-primitive classes for winter recreation opportunity spectrum.	2 acres (0%)

Describe the types of primitive recreation activities in the area.

Primitive recreation activities include hiking, backpacking, wildlife viewing, and fishing.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-144. Measures for 3a, North Fork Cold Creek area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	1 mile (74%).

Measures	Outcome
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	No known existing whitebark pine and no potential whitebark pine habitat.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	None.
Species richness percent of total acreage.	No acres of levels 3 or 4.
Acres of key conservation areas for wolverine.	None.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	High connectivity for wolverines between Mission Mountains and Swan Range; key for grizzly bear; not applicable for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-145. Measures for 3b, North Fork Cold Creek area

Measures	Outcome
Acres and total of scenic classes 1 and 2, which have high public value.	320 acres (72%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	0 acres

Describe any caves or unique geologic features in the area.

There are no known caves or unique geologic features in the inventory area. There are views to the Swan Valley and Swan Range.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports hybridized westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. Class 2 watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. Cold Creek is a class 2 watershed due to some impairment.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-146. Measures for 3e, North Fork Cold Creek area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres (0%)

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features in the inventory area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-147. Measures for 4a, North Fork Cold Creek area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular shape, surrounded by National Forest System lands. The western boundary is adjacent to the Mission Mountains Wilderness. Road 9599 almost completely bisects the inventory area.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 22 (Mission Mountains Wilderness), MA 15 (timberlands).
Describe the current management of the area.	1 mile of closed roads; <1 mile of terra trails ¹¹ (0 miles motorized); 1 mile of motorized over-snow routes; 327 acres (73%) allow motorized over-snow. 100% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	0 acres (0%).
Type and extent of management restrictions within the area.	1 mile of bull trout critical habitat (1 stream). 445 acres (100%) of lynx critical habitat 27 acres (6%) of grizzly bear security core. 114 acres (26%) of Mission Mountains Addition Inventoried Roadless Area #01504.

Piper Creek Area

A total of 590 acres were included in the Piper Creek wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation types: 90 percent western larch, lodgepole pine, and subalpine fir, which are common types on the Flathead National Forest. About 9 percent (50 acres) is in cedar type, and likely many of these are mature/old stands, a relatively rare type on the Flathead National Forest.

Potential vegetation types: ~ 50 percent cool-moist, supporting typical mixed conifer forests. Elevations extend down to 4,400 feet, and a large portion of the area (50 percent) is in warm-moist cedar potential vegetation types, capable of supporting western red cedar. It is unknown how much cedar currently exists on these sites. The potential also exists for grand fir, western hemlock, and western white pine.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-148. Measures for 1b, Piper Creek wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	100%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	0%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

No non-native or parasitic wildlife species are present. No past harvest or road building has occurred in the area. Vegetation reflects the influence of natural processes. There is no known major fire in the past 120 years. No known weed infestations within the area, but roads surrounding the area have infestations. There is a low to moderate probability of weeds within the area from these roads.

The main stream in this area is Piper Creek, which supports bull trout, westslope cutthroat trout, and invasive brook trout.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-149. Measures for 1c, Piper Creek wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	No past harvests or road building.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristic can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-150. Measures for 2a, Piper Creek wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity)	590 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	130 acres (22%)

This area provides for outstanding opportunities for solitude as it is unroaded, with one hiking trail (Piper Creek Trail #119) that traverses the area. It is adjacent to the Mission Mountains Wilderness along the entire western boundary. About 98 percent of the area is within the Mission Mountains Addition #01502 Inventoried Roadless Area.

In the winter, about 78 percent of the area is open to motorized over-snow vehicle use, which might reduce opportunities for solitude in the area, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-151. Measures for 2b, Piper Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and non-primitive classes for summer recreation opportunity spectrum.	352 acres (60%)
Acres and percent of total of primitive and non-primitive classes for winter recreation opportunity spectrum.	126 acres (21%)

Primitive recreation activities are hiking, backpacking, wildlife viewing, and fishing.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-152. Measures for 3a, Piper Creek wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout	1 mile (100%)
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	No known existing whitebark pine and no potential whitebark pine habitat.
Acres and number of water howellia (listed as threatened species under the (listed as threatened species under the Endangered Species Act) fens and bogs	None.
Minimally represented or rare species/vegetation types in region	Minimally represented species: May support the presence of grand fir, cedar, western hemlock, and western white pine.
Species richness percent of total acreage	1 acre (< 1%) of levels 3 or 4
Acres of key conservation areas for wolverine	None.
Acres of key conservation areas for mountain goat	None.
Description of coarse-scale key connectivity for various species ¹⁰	High connectivity for wolverines between Mission and Swan Range; low for grizzly bear; not applicable for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-153. Measures for 3b, Piper Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	483 acres (82%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 77.	62 acres (11%)

Describe any caves or unique geologic features in the area.

There are no known caves or unique geologic features are present in the inventory area.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-154. Measures for 3e, Piper Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres (0%)

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features in the inventory area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-155. Measures for 4a, Piper Creek wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	One section (26) is adjacent to the Mission Mountains Wilderness on the western boundary; adjacent to National Forest System lands on the three other boundaries.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 2 (unroaded lands), MA 15 (timberlands), MA 22 (Mission Mountains Wilderness).
Describe the current management of the area.	No roads; 1 mile of terra trails ¹¹ (0 miles motorized); 0 miles of motorized over-snow vehicle routes; 459 acres (78%) allow motorized over-snow vehicle use. 10% MA 1 (non-Forest); 22% MA 2 (unroaded lands); 68% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	0 acres (0%).
Type and extent of management restrictions within the area.	1 mile of bull trout critical habitat (1 stream). 590 acres (100%) of lynx critical habitat. 308 acres (52%) of grizzly bear security core. 579 acres (98%) in Mission Addition Inventoried Roadless Area #01502.

Puzzle Area

A total of 24,110 acres were included in the Puzzle wilderness inventory area. This area is located on the Hungry Horse-Glacier View Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 95 percent lodgepole pine, and subalpine fir, which are common types on the Flathead National Forest. About 5 percent of the area is in high-elevation sparse vegetation types.

Potential vegetation types: cool-moist and cold types dominate, supporting typical mixed conifer forests. There is a large amount of high elevation sites that is suitable for whitebark pine.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-156. Measures for 1b, Puzzle wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	93%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

Three non-native or parasitic species have been observed in the area: the house sparrow, brown-headed cowbird, and rock pigeon at the northeast survey point. Past harvests have occurred on 1,698 acres, concentrated in Skyland and Puzzle Creeks and along the edge of the area in Challenge and Granite Creeks. The forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this area is primarily affected by natural ecological processes, including fire (~ 5 percent burned in 1910; ~ 31 percent burned recently between 1998 and

2011). *There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.*

Weeds are limited to roads. There is a low probability of weeds in most of the area, with the exception of Skyland Creek burn area, which is adjacent to road infestations.

Puzzle, Granite, Challenge, and Skyland are the main watersheds in this area. There are no aquatic invasive species in these watersheds. Bull trout and pure westslope cutthroat trout populations exist throughout.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-157. Measures for 1c, Puzzle wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvests occurred mostly in the early 1970s on gentle to moderate slopes. Most of the harvested areas have reforested except in parts of recent burns, specifically in Skyland Creek. Harvest areas are not visible, and associated road templates and skid trails are not evident from mid- or background view. The exception may be in parts of the recently burned area (lower reaches of Skyland Creek) and on steeper ground, where roads are evident in the foreground view (Skyland Creek and Morrison Creek).
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None. There is a proposal to move the Patrol Ridge repeater to the southwest of its current location and towards the wilderness boundary. This would be within the area, if it happens.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.

Improvement Type	Extent of Departures
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Small slivers of the Badger-Two Medicine Traditional Cultural District extend into this area. Remains of a historical fire camp from the early 1920s or 1930s are present.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-158. Measures for 2a, Puzzle wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	24,019 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	15,756 acres (65%)

Portions of this area provide outstanding opportunities for solitude. About 84 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The area is adjacent to the Great Bear Wilderness in the south and the Badger-Two Medicine on the Helena-Lewis and Clark National Forest to the east. Elevations in the area range from 7,610 feet on Elk Calf Mountain to around 4,800 feet in the valley bottom. The area includes Slippery Bill Mountain, Square Mountain, and the Puzzle Hills. Sights and sounds of human activities are only noticeable in the northern reaches of the area. The area is adjacent to U.S. Highway 2 in the north, which might reduce opportunities for solitude, but the impacts would not be pervasive.

There are 11 miles of motorized over-snow vehicle routes, and 35 percent of the area allows motorized over-snow vehicle use, which might reduce opportunities for solitude, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-159. Measures for 2b, Puzzle wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and non-primitive classes for summer recreation opportunity spectrum.	19,251 acres (80%)

Acres and percent of total of primitive and non-primitive classes for winter recreation opportunity spectrum.	14,391 acres (60%)
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Primitive recreation activities include hiking, backpacking, horseback riding, hunting, fishing, forest product gathering, cross-country skiing, and backcountry skiing. There are 22 miles of terra trails¹¹ (4 miles motorized).

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-160. Measures for 3a, Puzzle wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	12 miles (18%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There is no existing whitebark pine dominance type but several thousand acres of sites potentially suitable for whitebark pine. There are about 5,200 acres of mapped whitebark pine potential vegetation type. Genetically superior whitebark pine trees have been identified on Puzzle Hills and provide seed for whitebark pine tree improvement and restoration programs. Fifty-three acres of whitebark pine plantations in Skyland Creek were planted as part of the restoration program. A test plantation is planned to be established in 2017 in Skyland Creek as part of the tree improvement and whitebark pine restoration program and development of blister rust-resistant whitebark pine.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	Presence of two rare plants: <i>Draba densifolia</i> (dense-leaf draba), <i>Areaum austini</i> (Austin's knotweed).
Species richness percent of total acreage.	16,800 acres (70%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	12,227 acres (51%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	1,783 acres (7%) of mountain goat habitat.
Description of coarse-scale key connectivity for various species.	High for wolverine; high for grizzly bear; and low for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-161. Measures for 3b, Puzzle wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	6,342 acres (26%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55 72, and 75.	5,612 acres (23%)

Describe any caves or unique geologic features in the area.

There are no known caves or unique geologic resources in the area.

Question 3c

Are there cultural resources of historical significance in the area?

Small slivers of the Badger-Two Medicine Traditional Cultural District extend into this area. Remains exist of a historical fire camp from the early 1920s or 1930s.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-162. Measures for 3e, Puzzle wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres (0%)

Question 3f

Are there any scientific or educational features in the area?

There are whitebark pine plus trees identified, whitebark pine plantations, and the planned establishment of a test plantation, all of which are aspects of the ongoing whitebark pine restoration and research programs.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-163. Measures for 4a, Puzzle wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular in shape. The southern boundary is adjacent to the Great Bear Wilderness. A portion of the northwest boundary is adjacent to U.S. Highway 2. The western boundary is adjacent to the Badger-Two Medicine on the Helena-Lewis and Clark National Forest.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 2a (unroaded), MA 12 or 17 (riparian), MA 15 (timberlands), MA 21 (Great Bear Wilderness).
Describe the current management of the area.	< 1 mile of seasonally open road (Road #9604 is objective maintenance level 1); 11 miles of closed roads; 22 miles of terra trails ¹¹ (4 miles motorized); 11 miles motorized over-snow vehicle routes; 8,346 acres (35%) allow motorized over-snow vehicle use. 65% MA 2; 1% MA 7 (timberlands in areas of high scenic value; 10% MA 12 (riparian habitat); 24% MA 15 or 16 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	1,430 acres (6%).
Type and extent of management restrictions within the area.	24,110 acres (100%) of lynx critical habitat. 18,052 acres (75%) of grizzly bear security core. 20,172 acres (84%) of Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.

Sky West Area

A total of 6,266 acres were included in the Sky West wilderness inventory area. This area is located on the Hungry Horse-Glacier View Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 90 percent subalpine fir, and lodgepole pine, which are common types on the Flathead National Forest. About 9 percent of the inventory area is high-elevation sparse vegetation types.

Potential vegetation types: cool-moist and cold types dominate, supporting mixed coniferous forest typical of such sites. High-elevation cold types, up to 7,200 feet elevation, could support whitebark pine.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-164. Measures for 1b, Sky West wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	90%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	99%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. There are several past harvest units, totaling 624 acres, as well as associated roads in the area. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 55 percent burned 1910-1921; ~ 25 percent recently burned, 1998-2007). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within

harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

Weeds in the area are limited to roads. There is a low probability of weeds in the area.

Twenty-Five Mile Creek is the main watershed within this area and supports westslope cutthroat trout. Bull trout are not present in the Twenty-Five Mile Creek due to a barrier near the Middle Fork of the Flathead River. There are no aquatic invasive species within this area.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-165. Measures for 1c, Sky West wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvests occurred in the early 1970s on gentle to moderate slopes. The harvested areas are now fully reforested in most areas and are not visible. The exceptions are in steeper parts of area (e.g., Twenty-Five Mile Creek), areas that were recently burned (lower reaches of Skyland Creek), and areas where major historical road templates and skid trails are visible in the foreground views.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	The Patrol Ridge repeater site is in the far southwestern part of the area.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.

Improvement Type	Extent of Departures
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-166. Measures for 2a, Sky West wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity.	6,235 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	977 acres (16%)

Portions of this area provide outstanding opportunities for solitude; especially as one moves away from U.S. Highway 2. About 75 percent of the area is within inventoried roadless area (Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485). The majority of the western boundary is adjacent to the Great Bear Wilderness. The northern boundary and the northwest boundary in Geifer Creek are adjacent to U.S. Highway 2 and private land. The area burned in the Challenge and Skyland Fires.

There are 8 miles motorized over-snow vehicle routes and about 84 percent of the area allows motorized over-snow vehicle use, which might reduce opportunities for solitude, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-167. Measures for 2b, Sky West wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive classes for summer recreation opportunity spectrum.	4,788 acres (76%)
Acres and percent of total of primitive and semiprimitive classes for winter recreation opportunity spectrum.	670 acres (11%)

Primitive recreation opportunities include hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, cross-country skiing, snowshoeing, and backcountry skiing. There are 5 miles of hiking and biking trails in the area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-168. Measures for 3a, Sky West wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	3 miles (19%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	Minimal acres of existing whitebark pine dominance type, although whitebark pine is present. About 1,600 acres of mapped whitebark pine potential vegetation type. Genetically superior whitebark pine plus trees have been identified and provide seed for whitebark pine tree improvement and restoration programs.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	None.
Species richness percent of total acreage.	5,411 acres (86%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	2,670 acres (43%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	10 acres (< 1%) of mountain goat habitat.
Description of coarse-scale key connectivity for various species.	High for wolverine; high for grizzly bear; low for lynx travel; very high for radio-collared lynx use.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-169. Measures for 3b, Sky West wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	3,864 acres (62%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	2,190 acres (35%)

Describe any caves or unique geologic features in the area.

There are no known cave resources in the area.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-170. Measures for 3e, Sky West wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres (0%)

Question 3f

Are there any scientific or educational features in the area?

There are whitebark pine plus trees identified which is a feature in ongoing whitebark pine restoration and research programs.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-171. Measures for 4a, Sky West wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular in shape. Borders the Great Bear Wilderness on the western boundary. The eastern boundary is adjacent to National Forest System lands. The northern boundary is along U.S. Highway 2.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 2a (unroaded lands), MA 12 (riparian area), MA 15a or MA 16a (timberlands on sensitive soils).

Measures	Outcome
Describe the current management of the area.	<p>5 miles of closed roads; 5 miles of terra trails¹¹ (0 miles motorized); 8 miles of motorized over-snow vehicle routes; 5,290 acres (84%) allow motorized over-snow vehicle use.</p> <p>62% MA 2 (unroaded lands); 4% MA 5 or 7 (timberlands with high scenic value); 10% MA 12 (riparian); 6% MA 13 (timberlands in mule deer and elk winter habitat); 18% MA 15 (timberlands).</p>
Acres and percent of total of wildland-urban interface in the area.	1,976 acres (32%).
Type and extent of management restrictions within the area.	<p>3 miles of bull trout critical habitat (one stream).</p> <p>6,267 acres (100%) of lynx critical habitat.</p> <p>4,041 acres (64%) grizzly bear security core.</p> <p>4,671 acres (75%) Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.</p>

Swan Face South Area

A total of 52,958 acres were included in the Swan Face South wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: ~ 70% subalpine fir, lodgepole pine, Douglas-fir, and western larch, which are common types on the Flathead National Forest. About 30 percent of the area is in high-elevation sparse vegetation and avalanche chutes.

Potential vegetation types: ~ 78 percent cool-moist type, supporting typical mixed conifer forest types. About 12 percent warm-moist (grand fir, cedar, western hemlock, and western white pine), and warm-dry (ponderosa pine) and whitebark pine types are in the inventory area. These types could potentially support the more rare forest types for the Flathead National Forest, specifically cedar, ponderosa pine, whitebark pine, and alpine larch. The current presence of these species on these sites is unknown.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-172. Measures for 1b, Swan Face South wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	97%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Past harvest areas (1,432 acres) are limited to Barber, Buck, and Owl Creeks. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected

by natural ecological processes; including fire (10 percent burned 2006-2011, no other known fires from 1898 to 2005). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

Weeds are limited to roads. There is some adjacent heavy weed infestations in the Condon and Simpson Creeks area, hence there is a moderate probability of weeds within area nearest these infestations. There is a low probability of weeds in the majority of the area.

This inventory area contains numerous watersheds. The most important bull trout watersheds are Lion Creek, Squeezer Creek, and Holland Lake. Holland Lake has recently been invaded by lake trout, and brook trout are present throughout the area. Most of the streams in this area also support westslope cutthroat trout.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-173. Measures for 1c, Swan Face South wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvested in 1965-78 on mostly gentle slopes. Densely stocked with trees. Major road templates and skid trails are likely evident in foreground view, especially in the 1970s harvested areas and units with steeper slopes.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historical mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.

Improvement Type	Extent of Departures
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Existing historical Holland Lake Guard Station; non-documented American Indian travel corridor through the Holland Creek area. This site has not been evaluated for eligibility for the National Register of Historic Places.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-174. Measures for 2a, Swan Face South wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	52,919 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	46,272 acres (87%)

Portions of this area provide outstanding opportunities for solitude. About 86 percent of the area is within an inventoried roadless area (Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485). Topography consists of mostly steep ridges and a continuous chain of high and often treeless, rugged mountains along the eastern boundary. Among the highest is Holland Peak at 9,356 feet. Below the high peaks is the canyon zone, where the streams of the face plunge down narrow bottoms between steep side slopes until they reach the valley floor. Rocks and cliffs prevail in much of the canyon zone. A majority of the topography in the inventory area provides screening of sight and sound.

A portion of the northern section is bordered by Swan River State Forest to the west. The southern portion has private land located within 0.5 mile of the western boundary. The private section adjacent to the western boundary might reduce opportunities for solitude, but the impacts would not be pervasive.

There are several high-use trails in the area (Napa Point, Smith Creek, and Holland Lake Trails) that are access points to the Bob Marshall Wilderness. The Holland Lake Trail is the most used trail into the Bob Marshall Wilderness.

There are 15 miles of motorized over-snow vehicle routes, and 13 percent of the area allows motorized over-snow vehicle use, which might reduce opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-175. Measures for 2b, Swan Face South wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and non-primitive classes for summer recreation opportunity spectrum.	48,266 acres (91%)
Acres and percent of total of primitive and non-primitive classes for winter recreation opportunity spectrum.	44,453 acres (84%)

Dispersed recreation activities in this inventory area include hiking, horseback riding, fishing, big-game hunting, camping, backpacking, and viewing wildlife. Napa Point, Smith Creek, and Holland Lake Trails are major access points to the Bob Marshall Wilderness. Several outfitters operate in the area from Bond and Trinkus Lakes south to Holland Lake. There are 34 miles of hiking trails in the area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-176. Measures for 3a, Swan Face South wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	16 miles (9%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There are about 200 acres of existing whitebark pine dominance type and likely many hundreds more acres where whitebark pine is present on the site. A large portion of the area is higher elevation (> 6,000 feet and up to about 8,700 feet elevation) and capable of supporting whitebark pine. Harsh, exposed aspects favored by whitebark pine are plentiful. There are about 9,800 acres of mapped whitebark pine potential vegetation type. A 67-acre whitebark pine plantation was established in the Condon Mountain area in 2013-2014 as part of whitebark pine restoration program.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	Contains part of one known pond (< 1 acre of a < 1 acre pond).
Minimally represented or rare species/vegetation types in region.	<p>Presence of the following rare plants:</p> <p><i>Parmeliella triptophylla</i> (lead lichen), <i>Grindelia howellii</i> (Howell's gumweed), <i>Cardamine rupicola</i> (cliff toothwort), <i>Brigantiaea praetermissa</i> (a lichen), <i>Howellia aquatilis</i> (water howellia), <i>Cypripedium parviflorum</i> (small yellow lady's slipper), <i>Cardamine rupicola</i> (cliff toothwort), and <i>Synthyris canbyi</i> (Mission Mountain kittentails).</p> <p>Minimally represented species: May support the presence of grand fir, cedar, western hemlock, and western white pine.</p>

Measures	Outcome
Species richness percent of total acreage.	26,444 acres (50%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	36,096 acres (68%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	12,404 acres (23%) of mountain goat habitat.
Description of coarse-scale key connectivity for various species.	Key for wolverines; high for grizzly bear; low for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-177. Measures for 3b, Swan Face South wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	35,437 acres (67%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	20,238 acres (38%)

Describe any caves or unique geologic features in the area.

There are no known caves in the inventory area. Several falls are found in Bond, Lion, Condon, Rumble, and Holland Creeks. In Lion Creek Canyon, there is a mature cedar grove. Lion Creek passes through the grove in a series of cascades and falls. Holland Falls is a popular hiking destination at the Holland Lake area.

Question 3c

Are there cultural resources of historical significance in the area?

There is the existing historic Holland Lake guard station and a non-documented American Indian travel corridor through the Holland Creek area.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-178. Measures for 3e, Swan Face South wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres (0%)

Question 3f

Are there any scientific or educational features in the area?

There are no known educational features in the inventory area. There is a whitebark pine plantation established which is a feature in ongoing whitebark pine restoration and research programs.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-179. Measures for 4, Swan Face South wilderness inventory area

Measures for 4a	Outcome
Describe the shape and configuration of the area.	Long and irregular in shape, bordering the Bob Marshall Wilderness on the entire eastern boundary. The western boundary is mostly adjacent to National Forest System lands and, to the north, the Swan River State Forest. There is a buffer of 33 feet on each side from the centerline of Barber Creek NFS Road 905.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 9 (timberlands and white-tailed deer habitat), MA 13 (timberlands and mule deer and elk winter habitat), MA 15 (timberlands).
Describe the current management of the area.	14 miles of closed roads; < 1 mile of historical roads; 34 miles of terra trails ¹¹ (0 miles of motorized); 15 miles of motorized over-snow vehicle routes; 6,686 acres (13%) allows motorized over-snow vehicle use. 1% MA 1 (non-Forest); 80% MA 2 (unroaded); 12% MA 9 or 13 (timberlands and white-tailed deer winter habitat); 6% MA 15 or 16 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	6,159 acres (12%).
Type and extent of management restrictions within the area.	3 miles of bull trout critical habitat (three different streams); < 1 acre of bull trout critical habitat (part of Holland Lake, sliver effect from mapping). 52,708 acres (100%) of lynx critical habitat. 43,302 acres (82%) of grizzly bear security core. 45,319 acres (86%) of Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.

Tuchuck Area

A total of 32,662 acres were included in the Tuchuck wilderness inventory area. This area is located on the Hungry Horse-Glacier View Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: 85 percent Douglas-fir, lodgepole pine, western larch, and subalpine fir, which are common types on the Flathead National Forest. The area has about 700 acres of whitebark pine dominance type, including some of the most healthy whitebark pine communities on the Flathead National Forest, that have low levels of blister-rust infection. Alpine larch communities are present.

Potential vegetation types: cool-moist and cold type prevalent, supporting typical mixed conifer forest types. There is a substantial area of higher elevation suitable for whitebark pine (and alpine larch), which are more rare types.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-180. Measures for 1b, Tuchuck wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	98%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

The brown-headed cowbird is a non-native or parasitic wildlife species present in the area. Weeds are limited to roads. There is a low probability of weeds within the remaining area.

The main watersheds in the area are Trail and Colts Creeks. Trail Creek has bull trout and pure westslope cutthroat trout, and Colts Creek supports pure westslope cutthroat trout. There are no aquatic invasive species in this area.

Past harvests have occurred on 568 acres, mostly adjacent to a road that bisects the area. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire (> 80% of the area burned 1910-1929). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within the harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-181. Measures for 1c, Tuchuck wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable. These are the non-timber harvest treatments.	See response to question 1b.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvest occurred in the time period 1956-1967, with some additional harvest in 1983 (clearcuts adjacent to Frozen Lake road and within inventory area). With the exception of these recent harvests, units are not visible. The 1983 harvest areas are substantially noticeable from the foreground and likely from some midground viewpoints. The main road that bisects the area may be visible from some mid- or background viewpoints.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.

Improvement Type	Extent of Departures
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Two lookouts exist in the area: Thoma and Tuchuck. Thoma Lookout has been restored and is currently an active fire lookout. Tuchuck is not a standing structure. Other sites include the Graves Creek/Trail Creek Native American travel corridor, and pictographs close to the southern boundary.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-182. Measures for 2a, Tuchuck wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity (excludes roads with potential for receiving administrative use, open roads to be decommissioned, and motorized trails)	32,657 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	32,230 acres (99%)

This area provides outstanding opportunities for solitude. About 93 percent of this area is within inventoried roadless areas (Mount Hefty Inventoried Roadless Area #1481 and Tuchuck Inventoried Roadless Area #1483). The area is adjacent to the U.S./Canada border on the north, Kootenai National Forest on the west, National Forest System lands on the south, and private lands on the east. To the north, on the Canadian side of the border, some primitive roads and past timber management are visible. The sights and sounds of human habitation are limited in this area and might reduce opportunities for solitude, but the impacts would not be pervasive.

There is a 33-foot buffer on either side of Frozen Lake NFS Road 114A, which creates a linear exclusion in the inventory area that might reduce opportunities for solitude, but the impacts would not be pervasive.

There are 6 miles of over-snow routes, and about 1 percent of the area allows motorized over-snow vehicle use, which might reduce opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-183. Measures for 2b, Tuchuck wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	27,395 acres (84%)

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	25,325 acres (78%)

Primitive recreation opportunities include hiking, backpacking, horseback riding, hunting, forest product gathering, wildlife watching, cross-country skiing, snowshoeing, and backcountry skiing. Hiking to the summits of Mount Hefty and Tuchuck Mountain is popular. There are 34 miles of hiking and biking trails in the area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-184. Measures for 3a, Tuchuck wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	4 miles (4%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There are about 700 acres of existing whitebark pine dominance type, with many thousand more acres where whitebark pine is likely present. There are about 8,000 acres of mapped whitebark pine potential vegetation type. Genetically superior whitebark pine trees have been identified on Thoma Ridge and provide seed for whitebark pine tree improvement and restoration programs. Some of the least blister rust-infected whitebark pine stands on the Flathead National Forest occur in this inventory area.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	One rare plant is present: <i>Botrychium Sp.</i> (moonworts).
Species richness percent of total acreage.	13,928 acres (43%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	15,482 acres (47%) of very high maternal wolverine habitat.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Key for wolverines; not applicable for mountain goat; very high for grizzly bear U.S. to Canada and east-west from Glacier Park to Whitefish Range; high for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-185. Measures for 3b, Tuchuck wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high scenic public value.	9,641 acres (30%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	7,305 acres (22%)

Describe any caves or unique geologic features in the area.

There are known cave resources in the area. The area provides outstanding views of the Livingston Mountain Range in Glacier National Park.

Question 3c

Are there cultural resources of historical significance in the area?

There are two lookouts: Thoma and Tuchuck. Thoma has been restored and is a rental lookout. Tuchuck has not been restored and is not a standing structure. The Graves Creek/Trail Creek Native American travel corridor is at the southern boundary of the area. Pictographs are close to the southern boundary.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-186. Measures for 3e, Tuchuck wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	2,050 acres (6%) is the Tuchuck Research Natural Area

Question 3f

The Tuchuck Research Natural area is within this inventory area. The objective of this research natural area is to maintain representative examples of montane and subalpine vegetation type for research and educational purposes. The research natural area serves as an area for collecting baseline data for determining long-term ecological changes and as a monitoring area to determine the effects of management actions applied to similar ecosystems.

Whitebark pine plus trees have been identified in this area, which is a feature in ongoing whitebark pine restoration and research programs.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-187. Measures for 4a, Tuchuck wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	A generally rectangular shape that has the U.S./Canadian boundary as its northern boundary. The irregular shape on the western border follows the Kootenai National Forest/Flathead National Forest boundary (which is also the Lincoln County/Flathead County border). The eastern boundary follows the boundary between National Forest System and private land. The southern boundary skirts past harvest areas that are considered substantially noticeable. Frozen Lake road is to the North.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 2a (unroaded), MA 15 (timberlands), Kootenai National Forest.
Describe the current management of the area.	7 miles of closed roads; 3 miles of historical roads; 34 miles of terra trails ¹¹ (0 miles of motorized); 6 miles of motorized over-snow vehicle routes; 425 acres (1%) allow motorized over-snow vehicle use. 1% MA 7 (timberlands with high scenic value); 99% MA 11 (grizzly bear).
Acres and percent of total of wildland-urban interface in the area.	4,775 acres (14%).

Whale Area

A total of 69,584 acres were included in the Whale wilderness inventory area. This area is located on the Tally Lake and Hungry Horse-Glacier View Ranger Districts.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation dominance types: > 85 percent subalpine fir (Douglas-fir, western larch), which are common types on the Flathead National Forest. About 3 percent of the area is in the whitebark pine dominance type, with some alpine larch communities present.

Potential vegetation types: cool-moist and cold types predominate, supporting typical mixed conifer forest types. There is a substantial amount of cold, higher-elevation lands capable of supporting whitebark pine and alpine larch.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-188. Measures for 1b, Whale wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	87%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	99%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	100%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There are no non-native or parasitic wildlife species present. Weeds are limited to the roads. There is a low probability of weeds in the remaining area.

The main watersheds in this area are Red Meadow, Moose, Teepee, and Whale Creeks. Red Meadow and Whale Creeks support both bull trout and westslope cutthroat trout, whereas Teepee and Moose Creeks

only support westslope cutthroat trout. There is a small amount of hybridization between westslope cutthroat trout and rainbow trout within the area. No other aquatic invasive species exist within the area.

Much past harvesting and road building has occurred in parts of the area (9,343 acres), concentrated along streams that dissect the area and the upper stream basins. Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within this inventory area is primarily affected by natural ecological processes, including fire (~ 30 percent of the area burned 1919-1929; 20 percent burned in 1988). There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-189. Measures for 1c, Whale wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Most harvesting occurred in the 1950s on gentle to moderate slopes. The harvest areas are now densely stocked with trees and shrubs and are not visible. The exception may be associated road templates and numerous skid trails/jammer road templates in some areas, which may be evident in foreground view, especially in the recently burned area. Heavy revegetation in most areas restricts visibility in the mid- and background views.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	Some dispersed camping sites.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.

Improvement Type	Extent of Departures
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	Historical cabin remains and the remains of two lookouts (Akinkoka and Pioneer Mountain); Graves Creek/Trail Creek American Indian travel corridor.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation⁴.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-190. Measures for 2a, Whale wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	69,575 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	65,691 acres (94%)

This area provides outstanding opportunities for solitude. Vegetation and slopes provide screening throughout the inventory area. About 75 percent of this area is within the Thompson-Seton Inventoried Roadless Area #1483.

There are three roads (Shorty Creek, Moose Creek, and Inuya Pass) that are outside the inventory area, with 33-foot buffers on either side of the road that create linear exclusions in the inventory area. These roads might reduce opportunities for solitude, but the impacts would not be pervasive.

There are about 3 miles of motorized over-snow vehicle routes, and about 6 percent of the area allows for motorized over-snow vehicle use, which might reduce opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-191. Measures for 2b, Whale wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and semiprimitive nonmotorized classes for summer recreation opportunity spectrum.	61,840 acres (89%)
Acres and percent of total of primitive and semiprimitive nonmotorized classes for winter recreation opportunity spectrum.	59,846 acres (86%)

Primitive recreation opportunities include hiking, backpacking, horseback riding, hunting, fishing, forest product gathering, cross-country skiing, snowshoeing, and backcountry skiing. Other popular activities include hiking to the peaks of Nasukoin Mountain, Mount Thompson-Seton, and Mount Locke. There are numerous alpine lakes in the southeast part of the area, including Chain and Link Lakes. The Chain and

Link Lakes were considered for designation as a recreation area in the 1960s. There are about 58 miles of hiking and biking trails within the area.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-192. Measures for 3a, Whale wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout.	34 miles (19%).
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	A large amount (2,000 acres) of existing whitebark pine dominance type, with many thousand more acres of sites potentially capable of supporting whitebark pine and alpine larch. There are about 23,000 acres of mapped whitebark pine potential vegetation type.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs.	None.
Minimally represented or rare species/vegetation types in region.	The presence of 3 rare plants: <i>Botrychium</i> Sp. (moonworts), <i>Polystichum kruckebergii</i> (Kruckeberg's swordfern. <i>Verrucaria kootenaica</i> (speck lichen).
Species richness percent of total acreage.	41,357 acres (59%) of levels 3 or 4.
Acres of key conservation areas for wolverine.	43,909 acres (63%) of very high maternal habitat.
Acres of key conservation areas for mountain goat.	None.
Description of coarse-scale key connectivity for various species.	Key for wolverines; very high for grizzly bear from the U.S. to Canada and east-west from Glacier Park to the Whitefish Range; high for lynx and very high for radio-collared lynx use.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-193. Measures for 3b, Whale wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	34,429 acres (49%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	21,068 acres (30%)

Describe any caves or unique geologic features in the area.

There are known cave resources in the area.

Question 3c

Are there cultural resources of historical significance in the area?

There are historic cabin remains, the remains of two lookouts (Akinkoka and Pioneer Mountain), and the Graves Creek/Trail Creek American Indian travel corridor.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-194. Measures for 3e, Whale wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 acres (0%)

Question 3f

Are there any scientific or educational features in the area?

None.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-195. Measures for 4a, Whale wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular in shape; western boundary is the boundary with the Kootenai National Forest and Flathead National Forest. The northeast corner is adjacent to private lands. The southern boundary is near Red Meadow Road. Roads are buffered 33 feet on either side of roads in the Shorty Creek, Inuya Pass, and Moose Creek areas.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	MA 2a (unroaded), MA 3 (non-forested), MA 12 (riparian), MA 15 (timberland).

Measures	Outcome
Describe the current management of the area.	12 miles of closed roads; 32 miles of decommissioned or historical roads; 58 miles of terra trails ¹¹ (0 miles motorized); 3 miles of motorized over-snow vehicle routes; 3,888 acres (6%) allow motorized over-snow vehicle use. 10% MA 2 (unroaded); 1% MA 3 (non-forested); 81% MA 11 (grizzly bear); 2% MA 12 or 17 (riparian); 6% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	5,030 acres (7%).
Type and extent of management restrictions within the area.	13 miles of bull trout critical habitat (six different streams). 69,571 acres (100%) of critical lynx habitat. 62,671 acres (90%) of grizzly bear security core. 52,126 acres (75%) are in the Thompson-Seton Inventoried Roadless Area #1483.

Woodward Creek Area

A total of 2,198 acres were included in the Woodward Creek wilderness inventory area. This area is located on the Swan Lake Ranger District.

Criterion 1: Evaluate the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

Question 1a

What is the composition of plant and animal communities within the area?

Existing vegetation types: 96 percent subalpine fir and lodgepole pine, which are common types on the Flathead National Forest. Potential vegetation types: cool-moist and cold types, supporting mixed conifer forests typical of these sites. Most of the area is > 6,000 feet in elevation, which is whitebark pine habitat.

There are about 300 animal species within the Flathead National Forest. Appendix 6 of the final EIS lists species known to occur on the Forest and their association with particular biophysical settings, communities, and habitat components. Measure 3a provides information on the diversity of animal communities in each individual wilderness inventory area.

Question 1b

What is the extent to which the area reflects ecological conditions that would normally be associated with the area without human intervention?

Table 4-196. Measures for 1b, Woodward Creek wilderness inventory area

Measures	Outcome
Percent of area that is not affected by timber harvest (inverse of the percent of area of timber harvest).	87%
Percent total of the area without invasive weeds (inverse of the percent of total area that has invasive weeds).	0%
Percent of area that is not affected by maintenance level 1 roads template (inverse of the percent of area of maintenance level 1 roads).	99%
Percent of area that is not affected by decommissioned roads template (inverse of the percent of area of decommissioned roads).	100%
Percent of area that is not affected by known historical roads template (inverse of the percent of area of known historical roads).	100%

Describe the extent of invasive fish, plants, and animals. Describe the degree of human impacts to natural ecosystem characteristics and processes, such as forest structure, forest patterns, and soil components.

There is no non-native or parasitic wildlife species present. There is some past harvest and road building in upper South Woodward Creek (291 acres). Forest composition, structure, and patterns in harvest areas have been influenced by past human actions. The current vegetation within the inventory area is primarily affected by natural ecological processes. None of the area has burned within the past 120 years. There is long-term human-caused departure from natural soil physical and chemical characteristics on templates of harvest roads, including jammer roads. Within harvest units, there may be lingering impacts from equipment use (e.g., skid trails), but those impacts are typically scattered or in disconnected spots that are actively recovering.

There are no known weed infestations, and there is a low probability of weeds within this area.

The main stream in this area is South Woodward Creek, which supports bull trout, westslope cutthroat trout, and invasive brook trout.

Question 1c

What is the extent to which improvements (improvements criteria 71.22 from Forest Service Handbook 1909.12 chap. 70) included in the inventory represent a departure from naturalness?

Table 4-197. Measures for 1c, Woodward Creek wilderness inventory area

Improvement Type	Extent of Departures
Airstrips.	Not present.
Heliports.	Not present.
Vegetation treatments that are not substantially noticeable.	Captured in measure 1a.
Timber harvest areas where logging and prior road construction are not substantially noticeable.	Harvests occurred in 1976 (clearcut and shelterwood) that appear to be substantially noticeable.
Permanently installed vertical structures, such as electronic installations including cell towers and television, radio, and telephone repeaters, provided their impact, as well as their maintenance and access needs, are minimal.	None.
Areas of historic mining where impacts are not substantially noticeable.	None.
Areas of mining activity where impacts are not substantially noticeable.	None.
Range improvement areas with minor structural improvements (for example, fences or water troughs) and non-structural improvements (chaining, burning, spraying, potholing, and so forth) that are not substantially noticeable.	None.
Recreational improvements, such as occupancy spots or minor hunting or outfitting camps.	None.
Ground-return telephone lines, electric lines, and power lines if a right-of-way has not been cleared. Exclude power lines with cleared right-of-ways, pipelines, and other permanently installed linear right-of-way structures.	None.
Watershed treatment areas (contouring, diking, channeling) that are not substantially noticeable or where the wilderness characteristics can be maintained or restored through appropriate management actions.	None.
Lands adjacent to development or activities that impact opportunities for solitude.	See response to question 2a.
Structures, dwellings, and other relics of past occupation that are considered part of the historical and cultural landscape of the area.	None.

Criterion 2: Evaluate the degree to which the area has outstanding opportunities for solitude or for a primitive and unconfined type of recreation.

Question 2a

What is available for outstanding opportunity for solitude?

Table 4-198. Measures for 2a, Woodward Creek wilderness inventory area

Measures	Outcome
Area and percent of total of area available for summer nonmotorized opportunity	2,198 acres (100%)
Area and percent of total available for winter nonmotorized opportunity	6 acres (0%)

There is a very high opportunity for solitude in this area. About 37 percent of the area is within the Mission Addition Inventoried Roadless Area #01500. The topography is rolling and has vegetation that screens sight and sound. The inventory area is adjacent to the Mission Mountains Wilderness (south boundary) and the Flathead Indian Reservation (west boundary) and adjacent to State land (east boundary).

There are about 2 miles of motorized over-snow vehicle routes, and 99 percent of the inventory area is open to motorized over-snow vehicle use, which might reduce opportunities for solitude in the winter, but the impacts would not be pervasive.

Question 2b

What opportunities are available in the area for primitive and unconfined recreation?

Table 4-199. Measures for 2b, Woodward Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of primitive and non-primitive classes for summer recreation opportunity spectrum.	2,060 acres (94%)
Acres and percent of total of primitive and non-primitive classes for winter recreation opportunity spectrum.	0 acres (0%)

Describe the types of primitive recreation activities in the area.

Primitive recreation activities include wildlife observation, hiking, backpacking, fishing, and hunting.

Criterion 3: Evaluate the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Question 3a

Does the area contain rare plant or animal communities, rare ecosystems for wildlife habitat, rare ecosystems for aquatic species, rare ecosystems for terrestrial (vegetation) species, coarse-scale key connectivity for wildlife, or minimally represented/rare species or vegetation types?

Table 4-200. Measures for 3a, Woodward Creek wilderness inventory area

Measures	Outcome
Miles of streams that have bull trout and/or westslope cutthroat trout	None.
Acres of whitebark pine vegetation type. This is a species in decline, identified by USFWS as candidate for listing under the Endangered Species Act, and it is locally, regionally, and nationally rare.	There is no known existing whitebark pine in the area, although there appears to be an abundance of potential whitebark pine habitat. The elevation extends to 7,200 feet with the open, exposed aspects preferred by whitebark pine.
Acres and number of water howellia (listed as threatened species under the Endangered Species Act) fens and bogs	None.
Minimally represented or rare species/vegetation types in region ⁶	None.
Species richness percent of total acreage	574 acres (27%) of levels 3 or 4.
Acres of key conservation areas for wolverine	617 acres (28%) of very high maternal habitat.
Acres of key conservation areas for mountain goat	None.
Description of coarse-scale key connectivity for various species ¹⁰	Key for wolverine; high for grizzly bear; not applicable for lynx.

Question 3b

Are there any outstanding landscape features such as waterfalls, mountains, viewpoints, waterbodies, or geologic features?

Table 4-201. Measures for 3b, Woodward Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of scenic classes 1 and 2, which have high public value.	1,827 acres (83%)
Outstanding landscapes in acres/percent of total (extremely steep breakland, cliffs). Land types 17, 54, 55, 72, and 75.	614 acres (28%)

Describe any caves or unique geologic features in the area.

There are no known caves in the inventory area. This area is on the slopes of the Mission Mountains and provides mountain views to the east and the Swan Valley. The ridgetop provides views of Flathead Lake.

Question 3c

Are there cultural resources of historical significance in the area?

None known.

Question 3d

Are there high-quality water resources or important watershed features in the area?

This area supports bull trout and pure westslope cutthroat trout. The area has been assessed for watershed conditions under the watershed condition framework. This area is entirely within a class 1 watershed; class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Question 3e

Are there any special areas or research natural areas in the area?

Table 4-202. Measures for 3e, Woodward Creek wilderness inventory area

Measures	Outcome
Acres and percent of total of special areas or research natural areas.	0 (0%)

Question 3f

Are there any scientific or educational features in the area?

There are no known scientific or educational features in the inventory area.

Criterion 4: Evaluate the degree to which the area may be managed to preserve its wilderness characteristics.

Question 4a

How can the area be managed to preserve its wilderness characteristics?

Table 4-203. Measures for 4a, Woodward Creek wilderness inventory area

Measures	Outcome
Describe the shape and configuration of the area.	Irregular in shape. The western and northern boundaries are adjacent to the Flathead Indian Reservation. The eastern boundary is adjacent to the Swan River State Forest. The southern boundary is adjacent to the Mission Mountains Wilderness.
Describe any legally established rights or uses within the area.	None.
Are there specific Federal or State laws that may be relevant to availability of the area for wilderness or to the Forest's ability to manage the area to protect wilderness characteristics?	None.
Describe the management of adjacent lands.	Flathead Indian Reservation lands, State forest lands, and Mission Mountains Wilderness (MA 22).
Describe the current management of the area.	2 miles of closed roads; 1 mile of decommissioned or historical roads; 0 miles of terra trails ¹¹ ; 2 miles of motorized over-snow vehicle routes; 2,181 acres (99%) allow motorized over-snow vehicle use. 27% MA 1 (non-Forest); 73% MA 15 (timberlands).
Acres and percent of total of wildland-urban interface in the area.	0 (0%).
Type and extent of management restrictions within the area.	No bull trout critical habitat. 2,073 acres (94%) of lynx critical habitat. 1,509 acres (69%) of grizzly bear core. 820 acres (37%) of Mission Addition Inventoried Roadless Area #01500.

Step 3: Analysis

In addition to including the environmental effects analysis in the recommended wilderness section of the final EIS, Forest Service Handbook 1909.12 chap. 70 requires that for each area included in one or more alternatives, the following items must be identified:

- the name of the area and the number of acres to be considered;
- the location and a summarized description of a recommended boundary for each area;
- a brief description of the general geography, topography, and vegetation of the recommended area;
- a brief description of the current uses and management of the area;
- a description of the area's wilderness characteristics and the ability of the Forest to protect and manage the area so as to preserve its wilderness characteristics;
- a brief summary of the factors considered and the process used in evaluating the area and developing the alternatives; and
- a brief summary of the ecological and social characteristics that would provide the basis for the area's suitability for inclusion in the National Wilderness Preservation System.

Not all lands included in the inventory and subsequent evaluations are required to be carried forward to an alternative.

Alternative A

The no-action alternative is based on the 1986 forest plan, which had 98,400 acres as recommended wilderness. The five recommended wilderness areas from the 1986 plan are Alcove, Jewel Basin, Limestone, Slippery Bill, and the Swan Front. For more information, see section 3.15 in the final EIS. See figure 1-64 for a map of the recommended wilderness areas in alternative A.

Alternative B modified

Several factors were considered in developing the recommended wilderness areas in alternative B modified. The 190,403 acres were selected based upon consideration of the information within the wilderness evaluation, which indicated these areas had wilderness characteristics such as naturalness; undeveloped quality; outstanding opportunities for solitude or primitive and unconfined recreation; or other special features such as ecological, geological, or scientific, educational, scenic, or historical value. Another consideration was the minimization of conflict with existing uses. See figure 1-65 for a map of the recommended wilderness areas in alternative B modified.

The selection of the 190,403 acres recommended for wilderness under this alternative was carefully considered in the context of the other multiple-use considerations that the Forest is balancing in developing management area recommendations for the 2.4 million acres of its National Forest System lands, of which 1.2 million acres are already designated as wilderness. The remaining acres that were within the wilderness inventory and were not selected to be included under this alternative were determined to have conflicting uses that did not reflect the balance of multiple use the Forest was striving for in this alternative and/or to lack sufficient wilderness characteristics or wildlife conservation values. For more information, see the recommended wilderness analysis in the final EIS, section 3.15.

Alcove-Bunker recommended wilderness area

This recommended wilderness was derived from the Bob North wilderness inventory area.

Table 4-204. Alcove-Bunker recommended wilderness area

Factors	Description
1. Acres	18,901 acres
2. Summarized description of the recommended boundary	<p>This area is within the Bunker Creek drainage, north of the existing Bob Marshall Wilderness. The area is split into three parts. The buffered trails #91 and #101, and NFS Road 549 bisect the middle and the northwestern parts of the area. The buffers vary in width depending on terrain. The trail and road corridors allow for mechanized transport and connect with Trails #31 and #108. The three parts of the area are:</p> <ul style="list-style-type: none"> • The eastern part—The southern boundary follows the existing Bob Marshall Wilderness boundary until Gorge Creek. The western boundary is the Gorge Creek trailhead. The eastern boundary is Picture Ridge Trail #107. Bunker Creek forms the northern boundary, which is south of NFS Road 549. • The middle part—The southern boundary follows the existing Bob Marshall Wilderness boundary; the western boundary follows the divide between the South Fork drainage and the Swan River drainage, at the intersections of Trails #31 and #91. The eastern boundary is the Gorge Creek trailhead. The northern boundary is made up of portions of NFS Road 549 and Trail #101 and portions of Trail #91. • The northwestern part—The western boundary is Trail #7 (this trail is not included in the recommended wilderness area). The northeastern boundary is Trails #101 and #101a (these trails are not included in the recommended wilderness area). The southern boundary is Trail #91 (this trail is not within the recommended wilderness area; the boundary is offset to the interior of the trail in areas where there are historical or existing roads and flat ground).
3. Brief description of the general geography, topography, and vegetation	Much of the area is moderately steep to very steep, with some gentle slopes, and ranges from heavily timbered to subalpine land forms. Existing vegetation includes whitebark pine, subalpine fir, Douglas-fir, lodgepole pine, and western larch. The highest point in this area is Alcove Mountain at 8,053 feet.
4. Current uses and management	The 1986 forest plan direction is primarily for managed lands within grizzly bear habitat. About 53 percent of this area consists of the 1986 forest plan's Alcove recommended wilderness, and 94 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The two primary summer and winter recreation opportunity spectrum classes are primitive and semiprimitive nonmotorized. This area has 2.4 miles of nonmotorized trail.
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. Most of this area has intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped and not affected by human intervention. This area has 2.4 miles of nonmotorized trails along the boundary.</p>

Factors	Description
	<p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities: horseback riding, hiking, backpacking, fishing, hunting, wildlife viewing, gathering forest products, snowshoeing, and cross-country skiing.</p> <p>Solitude—There is outstanding opportunity for solitude as the sights and sounds of human activities and improvements are screened by topography or do not have impact due to distance; this area is very remote.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is very high as this area is remote, has little development, 94 percent of the area is within an inventoried roadless area, and the southern boundary is adjacent to the Bob Marshall Wilderness. A large portion (53 percent) of this area has been managed as recommended wilderness since the 1986 forest plan. Trail #91, which allows mechanized transport, bisects two of the three areas of the recommended wilderness area, and this might pose management challenges.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternatives	<ul style="list-style-type: none"> ○ High interest exists for this area to be recommended for wilderness. In addition, there is public interest in recommending all inventoried roadless areas as wilderness. ○ This area is adjacent to the Bob Marshall Wilderness and would expand it by 18,901 acres. ○ A portion (53 percent) of this area contains the 1986 forest plan's Alcove recommended wilderness. ○ This area has critical habitat for Canada lynx, but the quality has been affected by recent stand-replacing wildfires. When stand-replacing wildfires burn in lynx habitat, it becomes temporarily unsuitable until dense shrubs and/or small trees grow back (ILBT, 2013). This area has very high quality grizzly bear habitat, a very high amount of maternal denning habitat for wolverines, and high-quality habitat for mountain goats. ○ Bull trout and westslope cutthroat trout are present in Bunker Creek, which is designated as bull trout critical habitat. ○ This area represents an opportunity to add 1,621 acres of underrepresented ecological groups to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area is very high because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, wolverine, lynx, mountain goat, bull trout, and westslope trout; and ○ the undeveloped quality of the area is very high because the majority of this area is unroaded (97%), although there are 2.4 miles of nonmotorized trail. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the area offers outstanding opportunities for solitude; and ○ there is a high amount of primitive and/or unconfined recreation for hunting, horseback riding, fishing, hiking, cross-country skiing, and wildlife viewing.

Elk Creek recommended wilderness area

This recommended wilderness area is derived from the Elk Creek wilderness inventory area.

Table 4-205. Elk Creek recommended wilderness area

Factors	Description
1. Acres	1,442 acres
2. Summarized description of the recommended boundary	The western and southern boundaries are the existing Mission Mountains Wilderness. The northern boundary is along Elk Creek; the eastern boundary follows a section line.
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes lodgepole pine, Douglas-fir, western larch, and subalpine fir. This area has moderate slopes and is heavily timbered. Although no mountaintop is located in the area, the highest ridge point is about 6,800 feet and is the highest point in the area.
4. Current uses and management	The 1986 forest plan primary direction is timber production. The primary summer and winter recreation opportunity spectrum class is semiprimitive nonmotorized.
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention. There is a large, visible, older dozer firebreak along the ridge in the southern portion that has been rehabilitated.</p> <p>Undeveloped quality—The majority of this area is undeveloped and not affected by human intervention. This area has 2.4 miles of nonmotorized trails.</p> <p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities: fishing, paddling, hiking, backpacking, snowshoeing, and backcountry skiing.</p> <p>Solitude—The area is remote, and the majority of this area provides outstanding opportunities for solitude. Because much of the area has moderately steep slopes and is heavily timbered, sights and sounds are buffered, which provides opportunities for solitude.</p> <p>Other features of value—Elk Creek is the most productive stream for the threatened bull trout in the Swan River watershed.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is very high. This area is adjacent to the Mission Mountains Wilderness. The eastern boundary may pose a challenge to managers as it follows section lines and is not generally based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to the Mission Mountains Wilderness and within inventoried roadless areas. ○ This area is adjacent to the Mission Mountains Wilderness and would expand it by 1,442 acres. ○ This area is important to Canada lynx and wolverine (high quality and/or high amounts of habitat).

Factors	Description
	<ul style="list-style-type: none"> Elk Creek is the most productive stream for the threatened bull trout in the entire Swan River watershed and is an eligible wild and scenic river with the outstandingly remarkable value for fish. This area represents an opportunity to add 1,197 acres of underrepresented ecological groups to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> the naturalness of the area; much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as grizzly bear, wolverine, lynx, bull trout, and westslope cutthroat trout. Elk Creek is the most productive stream for the threatened bull trout in the Swan River watershed and is an eligible wild and scenic river with the outstandingly remarkable value for fish; and the undeveloped quality of the area is very high because this area is unroaded and has no trails within it. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> outstanding opportunities for solitude and primitive and/or unconfined recreation such as fishing, paddling, hiking, backpacking, snowshoeing, and backcountry skiing.

Java-Bear Creek recommended wilderness area

This recommended wilderness area is derived from the Essex wilderness inventory area.

Table 4-206. Java-Bear Creek recommended wilderness area

Factors	Description
1. Acres	1,824 acres
2. Summarized description of the recommended boundary	<p>This recommended wilderness area is separated into two parts, both of which are adjacent to the existing Great Bear Wilderness. The area is a thin strip of land that ranges from 0.1 to 0.5 mile from the existing wilderness, and it generally heads southeast towards the U.S. Highway 2 corridor.</p> <ul style="list-style-type: none"> Western part: The southwestern boundary is adjacent to the Great Bear Wilderness and ranges from 0.1 to 0.5 mile from the existing wilderness boundary. The eastern boundary follows Trail #152/62 Sheep-Elk Loop and the Logan Dirty Face Trail #62. This area is west of the Middle Fork of the Flathead River. Eastern part: The western and southern boundaries are adjacent to the Great Bear Wilderness. This area is east of the Middle Fork of the Flathead River and south of Bear Creek and U.S. Highway 2. The northern boundary ranges from 0.1 to 0.5 mile from existing designated wilderness. No discernible features define the northern boundary, but it typically is at least 0.25 mile south of U.S. Highway 2.

Factors	Description
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes Douglas-fir, lodgepole pine, subalpine fir, and western larch. In higher elevations, there is sparse vegetation. The slopes are very steep and heavily timbered, with the highest elevation in the area at 6,800 feet.
4. Current uses and management	<p>The 1986 forest plan primary direction is unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of semiprimitive nonmotorized. About 91 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The primary summer recreation opportunity spectrum class is semiprimitive nonmotorized, and the primary winter recreation opportunity spectrum class is semiprimitive nonmotorized.</p> <p>This area has 1.8 miles of nonmotorized trails; 1.3 miles allow mechanized transport.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped and not affected by human intervention. This area has 1.8 miles of nonmotorized trail; 1.3 miles allows mechanized transport.</p> <p>Unconfined and/or primitive recreation—Opportunities for hiking, backpacking, horseback riding, fishing, hunting, cross-country skiing, and backcountry skiing.</p> <p>Solitude—Depending on how close one is to the U.S. Highway 2 corridor, opportunities for solitude can range from moderate close to the corridor to very high as one travels away from the corridor.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high. This area is adjacent to the Great Bear Wilderness, and about 91 percent of this area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The current boundary may pose a challenge to managers as portions of the boundaries not adjacent to the Great Bear Wilderness generally are not based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to existing designated wilderness and within inventoried roadless areas. ○ This area is adjacent to the Great Bear Wilderness and would increase it by 1,824 acres. ○ The area includes high habitat for wolverines, mountain goats, and grizzly bear and contributes to connectivity in a key area. ○ Bull trout are in Bear Creek and westslope cutthroat trout are in Bear, Devil, and Sheep Creeks. ○ The eastern area has high values for connectivity between Glacier National Park and the Forest for wolverines, mountain goats, grizzly bear, and lynx. ○ This area represents an opportunity to add 372 acres of underrepresented ecosystems to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for	The <i>ecological characteristics</i> that provide the basis for suitability are as follows:

Factors	Description
suitability for inclusion in the National Wilderness Preservation System	<ul style="list-style-type: none"> o Naturalness of the area as much of the area is affected primarily by natural forces, has mostly intact ecological integrity and contains many indigenous species such as the grizzly bear, mountain goat, wolverine and bull trout. o Undeveloped quality of the area is very high as this area is unroaded with 1.3 miles of nonmotorized trails. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> o primitive and/or unconfined recreation for hunting, horseback riding, fishing, hiking and wildlife viewing; and o portions of this area have very high opportunities for solitude, although closer to the U.S. Highway 2 corridor, the opportunity for solitude is moderate.

Jewel Basin recommended wilderness area

This recommended wilderness area is derived from the Hungry Horse West wilderness inventory area.

Table 4-207. Jewel Basin recommended wilderness area

Factors	Description
1. Acres	18,462 acres
2. Summarized description of the recommended boundary	Generally the western boundary follows the Swan Crest and extend downslope of the crest in the Birch Lake area. The southern boundary at the southernmost point at Broken Lake Mountain, the boundary continues towards the divide between Wheeler and Quintonkon Creek. The southern boundary is along Trail #64 to junction of Trail #7 and follows the Jewel Basin Hiking Area boundary and then follows Trail #7 south. The eastern boundary meanders between the ridge between Biglow Creek and Kate Creek towards Graves Creek and then follows the Jewel Basin Hiking Area.
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes Douglas-fir, subalpine fir, western larch, whitebark pine, and lodgepole pine. Gentle to very steep slopes. Some timbered slopes with rocky slopes and outcrops, avalanche chutes, and high alpine lakes. Big Hawk Mountain at 7,542 feet is the highest point in this area.
4. Current uses and management	<p>The 1986 forest plan direction is the Jewel Basin Hiking Area and unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of semiprimitive nonmotorized. About 95 percent of this area is the 1986 Jewel Basin recommended wilderness area. About 98 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The primary summer and winter recreation opportunity spectrum class is primitive.</p> <p>This area contains 37 mile of nonmotorized trails. There are 0.8 miles of historical roads that are no longer on the road system within this area.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage	Natural quality —The majority of this area is very natural appearing and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.

Factors	Description
the area so as to preserve its wilderness characteristics	<p>Undeveloped quality—The majority of this area is undeveloped and not affected by human intervention. This area has 43 miles of nonmotorized trails.</p> <p>Unconfined and/or primitive recreation—Outstanding opportunities exist for primitive recreation included hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, snowshoeing, and cross-country and backcountry skiing.</p> <p>Solitude—There is very high opportunity for solitude in this area although mainline trails within the Jewel Basin Hiking Area have high levels of use on weekends and holidays.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is very high. About 94 percent of this area is the 1986 Jewel Basin recommended wilderness area, and about 98 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. Generally, boundaries follow natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is high public interest in this area remaining recommended wilderness. ○ A majority (95 percent) of this area was recommended wilderness in the 1986 forest plan. Eighty-three percent of this area contains the Jewel Basin Hiking Area. ○ This area has a high percentage of maternal habitat for wolverine and contributes to habitat connectivity for wolverine, grizzly bear, and lynx as well as a to continuous band of high-quality habitat mountain goats habitat that occurs from above Margaret Lake westward to Big Hawk Mountain in the Jewel Basin Hiking Area. ○ Aeneas Creek, which flows through the area, is an eligible wild and scenic river. ○ There is a high concentration of alpine lakes that support genetically pure westslope cutthroat trout. ○ This area represents an opportunity to add 6,586 acres of underrepresented ecological groups to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area, because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, wolverine, mountain goat, and westslope cutthroat trout; and ○ the undeveloped quality of the area is high because this area is unroaded with very limited developments. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ very high opportunities for solitude away from mainline trails in the Jewel Basin Hiking Area, and ○ primitive and/or unconfined recreation for hunting, horseback riding, fishing, hiking, and wildlife viewing.

Limestone-Dean Ridge recommended wilderness area

This recommended wilderness area is derived from the Bob North wilderness inventory area.

Table 4-208. Limestone-Dean Ridge recommended wilderness area

Factors	Description
1. Acres	15,026 acres
2. Summarized description of the recommended boundary	<p>The northern and eastern boundaries are the Great Bear Wilderness, and the southern boundary is the Bob Marshall Wilderness. Spotted Bear River NFS Road 568 bisects the main lobe; this buffered road corridor is excluded from the area. The western upper boundary is bordered by Road 564 and Whitcomb Creek. This area generally follows the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.</p> <p>The southern boundary is adjacent to the Bob Marshall Wilderness, and the western boundary follows the ridge line from Spotted Bear Mountain to 0.5 mile from the Spotted Bear River. The boundary then heads east, going upstream of the Spotted Bear River. The southeast boundary crosses the Spotted Bear River just upstream of Blue Lakes.</p>
3. Brief description of the general geography, topography, and vegetation	Much of the area is moderately steep to very steep and ranges from heavily timbered to subalpine landforms to open south-facing slopes. Existing vegetation includes subalpine fir, Douglas-fir, lodgepole pine, whitebark pine, and western larch. The highest point in the area is Whitcomb Peak at 7,306 feet. This area has a network of limestone caves near Sergeant Mountain and Spotted Bear Mountain.
4. Current uses and management	The 1986 forest plan direction is primarily unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum of primitive class. About 35 percent of this area contains the 1986 forest plan's Limestone Cave recommended wilderness area. Approximately 99 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The primary summer and winter recreation opportunity spectrum class is semiprimitive nonmotorized. The area has 10 miles of nonmotorized trails; 8 miles allow mechanized transport.
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped and not affected by human intervention. This area has 10 miles of nonmotorized trails; 8 miles allow mechanized transport.</p> <p>Unconfined and/or primitive recreation—Outstanding opportunities for primitive recreation activities in this area include horseback riding, hiking, backpacking, fishing, hunting, wildlife viewing, and cross-country skiing.</p> <p>Solitude—This area provides outstanding opportunities for solitude. With much of the area moderately steep to very steep and ranging from heavily timbered to subalpine land forms, sights and sounds are buffered, which allows for solitude.</p> <p>Other features of value—A network of limestones caves has had ongoing exploration for many years and provides scientific and educational value. Whitebark pine trees with apparent natural resistance to blister rust occur within the upper reaches of Big Bill Creek and provide seed for whitebark pine restoration programs.</p>

Factors	Description
	<p>The Forest's ability to protect and manage these wilderness characteristics is very high. About 19 percent of this area contains the 1986 forest plan Limestone Cave recommended wilderness, and this area is 99 percent within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The northern, eastern, and southern boundaries are adjacent to existing wilderness and use natural features that are locatable on the map or on the ground.</p>
<p>6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)</p>	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to existing designated wilderness and within inventoried roadless areas. ○ A portion (19 percent) of this area contains the 1986 forest plan Limestone Cave recommended wilderness area. ○ This area is adjacent to the Great Bear and Bob Marshall Wildernesses and expands the Bob Marshall Wilderness Complex by 15,026 acres. ○ This area is key habitat for Clark's nutcracker. ○ There are strong populations of bull trout in Spotted Bear River (bull trout critical habitat) and tributaries, as well as genetically pure westslope cutthroat trout in many streams throughout this area. ○ There is high and very high quality lynx habitat, and there is mountain goat habitat in this area. ○ A portion of this area has maternal denning habitat for wolverine, and a majority of the area contains high or very high quality grizzly bear habitat. ○ This area includes a portion of the Spotted Bear River, which is an eligible wild and scenic river. ○ This area represents an opportunity to add 1,352 acres of underrepresented ecological groups to the National Wilderness Preservation System.
<p>7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System</p>	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area, because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, wolverine, mountain goats, bull trout, and westslope cutthroat trout; and ○ the undeveloped quality of the area is high because this area is unroaded, has little development, and has 10 miles of nonmotorized trails. Unique ecological features and the network of limestone caves, which has had ongoing exploration for many years, provides scientific and educational value. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ primitive and/or unconfined recreation for horseback riding, hiking, backpacking, fishing, hunting, wildlife viewing, and cross-country skiing; and ○ outstanding opportunities for solitude.

Slippery Bill-Puzzle recommended wilderness area

This recommended wilderness area is derived from the Puzzle wilderness inventory area.

Table 4-209. Slippery Bill recommended wilderness area

Factors	Description
1. Acres	12,393 acres
2. Summarized description of the recommended boundary	The southern boundary is the Great Bear Wilderness, and the eastern boundary is the Continental Divide, which is also the administrative boundary between the Flathead National Forest and the Helena-Lewis and Clark National Forest. The northern boundary starts at the Continental Divide at Trail #251 and follows the trail south until NFS Road 569G. The boundary follows NFS Road 569.1 south to the end of the road and then heads north to Road 569G. NFS Road 569.1 is buffered and excluded from the recommended wilderness area. The northern boundary continues west towards the Morrison Creek trailhead (the trailhead is not within the recommended wilderness area) and then traverses southwest of the roaded portion to the boundary of the Great Bear Wilderness area.
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes whitebark pine, lodgepole pine, and subalpine fir. The area is moderately to heavily timbered and has gentle to steep slopes. Bullshoe Mountain at 8,000 feet is the highest point in the area.
4. Current uses and management	The 1986 forest plan primary management direction is unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of semiprimitive nonmotorized. About 43 percent of this area is the 1986 forest plan's Slippery Bill recommended wilderness area. About 98 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The primary summer and winter recreation opportunity spectrum class is semiprimitive nonmotorized. The area has 4 miles of nonmotorized trails that allow mechanized transport and 344 acres of motorized over-snow vehicle use.
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped and not affected by human intervention. This area has 4 miles of nonmotorized trails. The Patrol Ridge electronic site may be moved to this area.</p> <p>Unconfined and/or primitive recreation—Opportunities include hiking, backpacking, horseback riding, hunting, fishing, forest product gathering, and cross-country and backcountry skiing.</p> <p>Solitude—About 98 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485, which makes for outstanding opportunities for solitude. The area provides solitude and remoteness near the Continental Divide. Morrison and Granite are two mainline trails that traverse through the area and have high use.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is very high. About 98 percent of this area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485, and about 43</p>

Factors	Description
	percent of this area contains the 1986 forest plan's Slippery Bill recommended wilderness area. The northern boundary may pose a challenge to managers as it generally is not based on natural features that are locatable on the map or on the ground.
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to existing designated wilderness and within inventoried roadless areas. ○ A portion (43 percent) of this area contains the 1986 forest plan's Slippery Bill recommended wilderness area. ○ This area is adjacent to the Great Bear Wilderness and expands it by 12,393 acres. ○ The southern portion (the area around Crescent Cliff) is mountain goat habitat. ○ This majority of this area provides high-quality grizzly bear habitat and contains maternal denning habitat for wolverine. ○ The area has high and very high quality lynx habitat. ○ Area contributes to connectivity for wildlife in a key area, but connectivity has been negatively affected by recent stand-replacing wildfires. ○ Granite, Morrison, and Twenty-Five Mile Creeks support bull trout and native westslope cutthroat trout. ○ Granite and Morrison Creeks are designated as bull trout critical habitat. ○ The area contains 120 acres of underrepresented ecological groups within the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, wolverine, mountain goat, bull trout, and western cutthroat trout; and ○ the undeveloped quality of the area is very high because the majority of this area is unroaded (98 percent) with 4 miles of nonmotorized trails. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ primitive and/or unconfined recreation for hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, cross-country and backcountry skiing, and snowshoeing; and ○ opportunities for solitude are very high in the summer, whereas in the winter a small portion of the area (3 percent) allows for motorized over-snow vehicle use, which may impact opportunities for solitude.

Swan Front recommended wilderness area

This recommended wilderness area is derived from the Swan Face South wilderness inventory area.

Table 4-210. Swan Front recommended wilderness area

Factors	Description
1. Acres	42,534 acres
2. Summarized description of the recommended boundary	This area's boundaries generally follow those of the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485 in this area. The southern boundary is a ridgeline that is the administrative boundary between the Flathead National Forest and the Lolo National Forest. The northern boundary is adjacent to the Alcove recommended wilderness area and follows the ridgeline off Inspiration Point to a section line. A portion is adjacent to the Swan River State Forest. The eastern boundary is adjacent to the Bob Marshall Wilderness. The western boundary generally follows the existing inventoried roadless area boundary, although portions of the western boundary excludes six small areas of the inventoried roadless area that narrowly extend out towards the valley bottom.
3. Brief description of the general geography, topography, and vegetation	The area includes steep ridges, and a continuous chain of high and often treeless, rugged mountains forms the eastern boundary. Below the high peaks is the canyon zone, where the streams of the face plunge down narrow bottoms between steep sideslopes until they reach the valley floor. Rocks and cliffs prevail in much of the canyon zone. The area includes high-elevation sparse vegetation and avalanche chutes. The existing vegetation is subalpine fir, lodgepole pine, Douglas-fir, whitebark pine, and western larch. The highest point in the area is Holland Peak at 9,356 feet.
4. Current uses and management	The 1986 forest plan primary direction is unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of primitive. About 100 percent of this area contains the 1986 forest plan Swan Front recommended wilderness area. About 99 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The primary summer and winter recreation opportunity spectrum class is primitive. The area has 20 miles of nonmotorized trails. This area contains Holland Lookout which is a functioning lookout that is used as needed.
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	Natural quality —The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention. Undeveloped quality —The majority of this area is undeveloped and not affected by human intervention. This area has 20 miles of nonmotorized trails. Unconfined and/or primitive recreation —Outstanding opportunities for unconfined or primitive recreation include hiking, horseback riding, fishing, and big-game hunting, camping, backpacking, and viewing wildlife. Napa Point, Smith Creek, and Holland Lake Trails are major access points to the Bob Marshall Wilderness. Solitude —The majority of the area is within an inventoried roadless area, which provides screening of sight and sound and provides outstanding opportunities for solitude. The western boundary is close to private land, which might reduce opportunities for solitude in that area. Other features of value —None.

Factors	Description
	<p>The Forest's ability to protect and manage these wilderness characteristics is very high. About 94 percent of this area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485, and about 100 percent of this area is within the 1986 forest plan's Swan Front recommended wilderness area. The western boundary generally follows the inventoried roadless area boundary. It meanders around roads and private property and along contour lines and may pose a challenge to managers as the boundary is not always based on natural features that are locatable on the map or on the ground.</p>
<p>6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)</p>	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to the Bob Marshall Wilderness and within inventoried roadless areas. ○ This area is adjacent to the Bob Marshall Wilderness and would expand the Bob Marshall Wilderness by 42,534 acres. ○ The North and South Forks of Lost Creek and Lion Creek are spawning streams for bull trout and are designated as critical habitat. ○ The South Fork of Lost Creek contains pure populations of westslope cutthroat trout. ○ The section along the Swan Crest provides maternal denning habitat for wolverines. ○ There is high-quality grizzly bear habitat. ○ There is high-quality winter and summer habitat for mountain goats in rugged terrain along the Swan Crest. ○ Area provides habitat for alpine mountainsnails. Lower Holland Falls has the only known nesting colony of black swifts on the Forest. ○ Lion Creek is an eligible wild and scenic river. ○ The area represents the opportunity to add 10,028 acres of underrepresented ecological groups to the National Wilderness Preservation System.
<p>7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System</p>	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, wolverine, mountain goat, bull trout, and westslope cutthroat trout; and ○ the undeveloped quality of the area is very high because the area is unroaded and 98 percent of the area is within the 1986 forest plan's Swan Front recommended wilderness area. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ outstanding opportunities for solitude, and ○ primitive and/or unconfined recreation opportunities for hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, cross-country and backcountry skiing, and snowshoeing.

Tuchuck-Whale recommended wilderness area

This recommended wilderness area is derived from the Tuchuck and Whale wilderness inventory areas.

Table 4-211. Tuchuck-Whale recommended wilderness area

Factors	Description
1. Acres	79,821 acres
2. Summarized description of the recommended boundary	<p>This area is bisected by two roads that are not included into the recommended wilderness area: Frozen Lake Road 114A in the northern part has 3 miles of open yearlong road and then the road is barriered and closed to motorized use for 6 miles. In the wintertime, this road is a designated motorized over-snow vehicle route corridor, including 100 feet either side of the route corridor.</p> <p>The southern road is the Graves Creek/Trail Creek NFS Road 114, which is open yearlong, but in winter snowmobiles can only go to the Tuchuck campground. This road is excluded from the recommended wilderness area.</p> <p>The area generally follows boundaries of the Tuchuck and Thompson-Seton Inventoried Roadless Areas. The northern boundary follows the Canadian/United States border until 2 miles from Frozen Lake, and then it follows adjacent areas that were previously harvested up to the Whitefish divide. The northern boundary excludes the clearing along the international boundary line, where the vegetation is routinely removed. The western boundary is just off (by 100 feet) the Whitefish Divide Trail #26 (Pacific Northwest National Scenic Trail) between the Kootenai and Flathead National Forests to Link Mountain. There is a 2-mile linear exclusion consisting of buffered trail 374 to Huntsberger Lake that is outside the recommended wilderness area. The southern boundary follows ridgelines around the Chain Lakes area and then goes just north of Red Meadow Road (circumventing the Chain Lakes area). North of Red Meadow NFS Road 115, the boundary follows past harvest areas. The eastern boundary meanders in and out of drainages to follow past harvest areas and roads. The northeast portion of the eastern boundary follows the county's wildland-urban interface boundary.</p>
3. Brief description of the general geography, topography, and vegetation	<p>The topography consists of steep alpine glaciated canyons and gently rolling ground moraines, with glacial cirque headwalls, glacial trough walls, high-elevation slab rock, and glacial tills. Nasukoin Mountain at 8,086 feet is the highest point in the area. The major drainages are Trail Creek, Whale Creek, and Red Meadow Creek. The predominant tree species are lodgepole pine and western larch with a mixture of subalpine fir, Douglas-fir, and spruce. Whitebark pine dominates in the upper elevations. Alpine larch, a rare high-elevation species, is also present.</p>
4. Current uses and management	<p>The 1986 forest plan management direction is timber and non-forested lands capable of providing grizzly bear habitat located in the Trail Creek area. About 91 percent of the area is within the following inventoried roadless areas: Mount Hefty (10 percent), Thompson-Seton (59 percent), and Tuchuck (22 percent). The primary winter and summer recreation opportunity spectrum class is semiprimitive nonmotorized.</p> <p>The area has 4.5 miles of existing roads that are closed yearlong, 16 miles of historical roads that are no longer on the road system, and 82 mile of nonmotorized trails miles that allow mechanized transport.</p> <p>The area contains the Thoma Lookout, which is currently active during the fire season. The area also contains the Mount Hefty electronic site.</p>

Factors	Description
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—This area is mostly undeveloped and not affected by human intervention. The area has 4.5 miles of existing roads that are closed yearlong and 82 mile of nonmotorized trails. Thoma Lookout is an active fire lookout in this area.</p> <p>Unconfined and/or primitive recreation—Opportunities include hiking, backpacking, horseback riding, hunting, forest product gathering, wildlife watching, cross-country skiing, snowshoeing, and backcountry skiing.</p> <p>Solitude—There are outstanding opportunities for solitude because the area is adjacent to the U.S./Canada border on the north, national forest system lands to the west and south, and private lands to the east. Ninety-one percent of the area is an inventoried roadless area.</p> <p>Other features of value—Healthy whitebark pine that has apparent natural resistance to blister rust occurs within this area, with the potential to provide seed for whitebark pine restoration programs.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is very high. About 91 percent of this area is within the 3 inventoried roadless areas. The current boundaries may pose a challenge to managers as they are not always based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is high public interest in this area; it was part of the Whitefish Range Partnership agreement and the area within the wilderness inventory area was carried forward as recommended wilderness. ○ The Tuchuck Research Natural Area (2,050 acres) is within this recommended wilderness area. ○ Graves Creek/Trail Creek is an historic Native American travel corridor. ○ Bull trout and westslope cutthroat trout are present in Trail and Whale Creeks (designated bull trout critical habitat). ○ This area is important for providing connectivity with Canada and between the Whitefish Range and Glacier National Park for grizzly bear, wolverine, and Canada lynx. ○ This area provides high and very high quality grizzly bear habitat, with a high density of grizzly bears. ○ Nokio, Yakinikak, Trail, and Whale Creeks are eligible wild and scenic rivers within this area. ○ This area represents an opportunity to add 6,018 acres of underrepresented ecological groups within the National Wilderness Preservation System. There is a substantial amount of apparent blister rust-resistant whitebark pine in the upper elevations. Alpine larch, a rare high-elevation species, is also present.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, wolverine, mountain goat, bull trout, and western cutthroat trout; ○ the undeveloped quality of the area is high as this area is unroaded; and

Factors	Description
	<ul style="list-style-type: none">○ a unique ecological feature is the phenotypically superior whitebark pine trees identified in this area that may provide seed for whitebark pine tree restoration objectives. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none">○ opportunities for primitive and/or unconfined recreation for hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, cross-country and backcountry skiing, and snowshoeing; and○ outstanding opportunities for solitude.

Alternative C

The 506,900 acres of recommended wilderness in alternative C were selected based upon consideration of the information within the wilderness evaluation and in response to issues identified in the scoping of the proposed action. A significant number of scoping comments identified a desire for all inventoried roadless acres to be managed as recommended wilderness. The selection of the 506,900 acres recommended for wilderness under this alternative included the inventoried roadless acres within the wilderness inventory area.⁴ In some cases, areas outside inventoried roadless areas but inside the wilderness inventory area were added to help with boundary management (blocking up areas instead of having narrow intrusions).

The remaining acres that were within the wilderness inventory area and not selected to be included under this alternative were determined to be unresponsive to the input received in scoping, to have conflicting uses that did not reflect the balance of multiple use the Forest was striving for in this alternative, and/or to lack sufficient wilderness characteristics or wildlife conservation values.

For more information, see the recommended wilderness analysis in the final EIS, section 3.15. For a map of the recommended wilderness areas for alternative C see figure 1-66 in appendix 1 of the FEIS.

⁴ Not all inventoried roadless areas were included in the wilderness inventory area. For more information about the inventory process, refer to Step 1, [Identification and Inventory](#), in this appendix.

Alcove Bunker Recommended Wilderness Area

This recommended wilderness area is derived from portions of the Bob North and Hungry Horse West wilderness inventory areas.

Table 4-212. Alcove-Bunker recommended wilderness area

Factors	Description
1. Acres	63,962 acres
2. Summarized description of the recommended boundary	<p>The southern boundary of this area is adjacent to the Bob Marshall Wilderness, and portions of the northern/northwestern boundary are adjacent to the Jewel Basin-Swan Crest recommended wilderness area. The eastern boundary generally follows the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485 and includes four areas that were not included in the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The western boundary generally follows the boundary of the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The southwestern boundary runs roughly south of Trail #31 (Napa Lookout Trail), then goes up to the ridge follows the ridge to Inspiration Point and then the Bob Marshall Wilderness.</p> <p>The first 10 miles of Bunker Creek NFS Road 549 form a corridor that is excluded from this area; the first 4 miles of the road are open yearlong, and the rest is closed yearlong by a physical barrier. At this point, Trail #101 uses the road template and is a nonmotorized trail that allows mechanized transport.</p>
3. Brief description of the general geography, topography, and vegetation	<p>The area is moderately steep to steep, reaching from heavily timbered to subalpine land forms with scattered rock outcroppings. Existing vegetation is subalpine fir, Douglas-fir, lodgepole pine, western larch, and whitebark pine.</p> <p>The highest point in the area is Alcove Mountain at 8,053 feet.</p>
4. Current uses and management	<p>The 1986 forest plan primary direction is timber and non-forested lands capable of providing grizzly bear habitat in the Bunker Creek area. About 16 percent of this area is the 1986 forest plan Alcove Addition recommended wilderness area. The primary summer and winter recreation opportunity spectrum class is semiprimitive nonmotorized. About 92 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.</p> <p>The areas has 11 miles of existing closed yearlong roads and 18 miles of historical roads that are decommissioned. There are 21 miles of nonmotorized trails, of which 20 miles allow mechanized transport. Motorized over-snow vehicle use is suitable on 23,409 acres December 1 through March 31.</p> <p>The area contains the Stony Hill electronic site, which requires periodic helicopter flights for maintenance.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. Most of this area has intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped, although there is an electronic site at Stony Hill. Within this area, 11 miles of existing system roads are closed yearlong and there are 21 miles of nonmotorized trails.</p> <p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities for horseback riding, hiking, backpacking, fishing, hunting, wildlife viewing, gathering forest products, snowshoeing, and cross-country skiing.</p>

Factors	Description
	<p>Solitude—There is outstanding opportunity for solitude as the sights and the sounds of human activities and improvements are screened by topography or do not have an impact due to distance. The eastern boundary is close to Meadow Creek Airstrip, which is within 1 mile of the very southeastern edge of the area, but as one travels away from the southeastern boundary, the noise from the airstrip diminishes.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high as this area is remote, has little development, 92 percent of the area is within an inventoried roadless area, and the southern boundary is adjacent to the Bob Marshall Wilderness. A portion (16 percent) of this area has been managed as recommended wilderness since the 1986 forest plan and does not allow mechanized transport or motorized use. The Stony Hill electronic site poses a challenge to preserve the wilderness characteristics of the area because maintenance for this site includes helicopter flights and landings. The 11 miles of existing roads that are closed yearlong would need to be decommissioned.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ Significant interest exists for this area to be recommended for wilderness. In addition, there is public interest in recommending all inventoried roadless areas as wilderness. ○ This area is contiguous to the Bob Marshall Wilderness and would expand it by 63,962 acres. ○ There is high-quality grizzly bear habitat and wolverine, mountain goat, and lynx habitat throughout this area. ○ This area has a strong population of bull trout and westslope cutthroat trout. ○ This area represents an opportunity to add 8,445 acres of underrepresented ecosystems to the National Wilderness Preservation System. High-elevation whitebark pine ecosystems comprise about 30 percent of this area.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, wolverine, lynx, mountain goat, bull trout, and westslope cutthroat trout; and ○ the undeveloped quality of the area is high as the majority of this area is unroaded (92 percent), although there are 11 miles of existing system roads that are closed and the area includes 21 miles of nonmotorized/non-mechanized trail with 20 miles of nonmotorized trail where mechanized transport is allowed. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ outstanding opportunity for solitude and ○ outstanding primitive and/or unconfined recreation opportunities for hunting, horseback riding, fishing, hiking, cross-country skiing, and wildlife viewing.

Canyon Recommended Wilderness Area

This recommended wilderness area was derived from the Canyon wilderness inventory area.

Table 4-213. Canyon recommended wilderness area

Factors	Description
1. Acres	7,939 acres
2. Summarized description of the recommended boundary	This area is irregular in shape and generally follows the Standard Peak Inventoried Roadless Area boundary. The Smokey Range ridge forms the spine of the area, with four nodes of ridges that come off the spine. No discernible physical features define the boundary.
3. Brief description of the general geography, topography, and vegetation	The existing vegetation is subalpine fir, Douglas-fir, whitebark pine, and western larch. South-facing slopes are fairly open, with less vegetation than north-facing slopes, but there is dense understory when vegetation is present. The area has moderate to steep slopes with flatter ridgetops and high elevation basins. Standard Peak at 7,200 feet is the highest point in the area.
4. Current uses and management	<p>The 1986 forest plan direction is primarily managed for unroaded lands and dispersed recreation. The recreation opportunity spectrum class for summer is primarily semiprimitive nonmotorized and for summer is primarily semiprimitive motorized class. About 99 percent of the area is within the Standard Peak Inventoried Roadless Area.</p> <p>This area has 7 miles of trails that allow mechanized transport, and 344 acres (4 percent) of the area is suitable for motorized over-snow vehicle use December 1 through March 31.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped, with 7 miles of nonmotorized trail that allow for mechanized transport. There are no roads in this area.</p> <p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities for hiking, backcountry skiing, cross-country skiing, horseback riding, hunting, fishing, and huckleberry picking.</p> <p>Solitude—The majority of this area provides outstanding opportunities for solitude in the summer because the sights and sounds of human activities and improvements are screened by topography or do not have an impact due to distance. In the winter, this area provides very high opportunities for solitude as less than 4 percent of the area is suitable for motorized over-snow vehicle use, which can reduce opportunities for solitude.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high; 99 percent of the area is within an inventoried roadless area. The current boundaries may pose a challenge to managers as they are not based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is public interest in recommending all inventoried roadless areas as wilderness. ○ There is a strong population of bull trout and westslope cutthroat trout. ○ The area has a high amount of wolverine maternal denning habitat, lynx habitat ranging from low to high habitat, and grizzly bear denning/spring habitat.

Factors	Description
	<ul style="list-style-type: none"> ○ This area represents an opportunity to add 1,520 acres of underrepresented ecosystems to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, wolverine, lynx, bull trout, and westslope cutthroat trout; and ○ the undeveloped quality of the area as the majority of this area is unroaded (92 percent). <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ outstanding opportunities for solitude in the summer and very high opportunities in the winter and ○ outstanding primitive and/or unconfined recreation opportunities for hunting, horseback riding, fishing, hiking, cross-country skiing, and wildlife viewing.

Coal Recommended Wilderness Area

This recommended wilderness area was derived from the Coal wilderness inventory area.

Table 4-214. Coal recommended wilderness area

Factors	Description
1. Acres	45,257 acres
2. Summarized description of the recommended boundary	<p>This area is irregular in shape and is separated into three distinct parts that are adjacent to each other but are not connected.</p> <p>The northern part is between the Hay Creek and Red Meadow Creek drainages and follows the boundaries of the Benchmark Inventoried Roadless Area.</p> <p>The middle part follows the boundaries of the Coal Ridge Inventoried Roadless Area and is between the Hay Creek and Coal Creek drainages.</p> <p>The southern part follows the Dead Horse Ridge inventoried roadless area, and its western edge is the Whitefish Divide. The inventoried roadless area goes east following the spine of Dead Horse Ridge. It is bounded by the Whitefish Divide on the western edge and is surrounded by open and closed roads and past timber harvest units.</p>
3. Brief description of the general geography, topography, and vegetation	<p>The existing vegetation is subalpine fir, Douglas-fir, western larch, and whitebark pine. This area is moderately to heavily timbered, with areas of sparse vegetation and shrubs that occur mainly in avalanche chutes.</p> <p>Red Mountain, at 7,601 feet, is the highest point in the area.</p>
4. Current uses and management	The 1986 forest plan direction is primarily managed for unroaded lands suitable for dispersed recreation that meet the recreation opportunity spectrum class semiprimitive nonmotorized and semiprimitive motorized. The recreation opportunity spectrum class for summer and winter is primarily semiprimitive

Factors	Description
	<p>nonmotorized. About 96 percent of the area is within the following inventoried roadless areas: Benchmark (14 percent), Coal Ridge (31 percent), and Dead Horse Ridge (51 percent).</p> <p>The southern area has 1 mile of existing closed yearlong roads and 14 miles of historical roads that are no longer on the transportation system. The middle and southern area have 35 miles of nonmotorized trails, with 33 miles allowing mechanized transport. Combined, the three areas have 2 miles of motorized over-snow vehicle routes and 4,372 acres (10 percent) of motorized over-snow vehicle use December 1 through March 31.</p>
<p>5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics</p>	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—Much of this area is undeveloped, with 35 miles of nonmotorized trail, of which 33 miles allow for mechanized transport. There is 1 mile of existing road that is closed yearlong in this area.</p> <p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities for hiking, backpacking, horseback riding, fishing, hunting, forest product gathering, and cross-country and backcountry skiing.</p> <p>Solitude—In the summer, this area provide outstanding opportunity for solitude; the sights and sounds of human activities and improvements are screened by topography or do not have an impact due to distance. In the winter, this area provides very high opportunities for solitude as this area has 2 miles of motorized over-snow vehicle route and about 10 percent of the area is suitable for motorized over-snow vehicle use, which can reduce opportunities for solitude.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is moderate to high; 96 percent of the area is within an inventoried roadless area. The boundaries of the three parts would present a challenge for managers as they are separated by roads.</p>
<p>6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)</p>	<ul style="list-style-type: none"> ○ There is public interest in recommending all inventoried roadless areas as wilderness. ○ Portions of this area include high to very high value lynx habitat, wolverine maternal denning habitat, and a mix of moderate and high value grizzly bear habitat. ○ This area represents an opportunity to add 4,646 acres of underrepresented ecosystems to the National Wilderness Preservation System.
<p>7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System</p>	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, wolverine, and lynx; and ○ the undeveloped quality of the area because this area is unroaded (96 percent), with 14 miles of historical roads that are no longer on the transportation system and 35 miles of nonmotorized trails, with 33 miles allowing mechanized transport.

Factors	Description
	<p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ very high opportunity for solitude in the summer and high opportunity for solitude in the winter as motorized over-snow vehicle use can reduce opportunities for solitude and ○ outstanding primitive and/or unconfined recreation opportunities for hiking, backpacking, horseback riding, fishing, hunting, forest product gathering, and cross-country and backcountry skiing.

Cold Jim Recommended Wilderness Area

This recommended wilderness area is derived from portions of the North Fork Cold Creek and Jim Creek wilderness inventory areas.

Table 4-215. Cold Jim recommended wilderness area

Factors	Description
1. Acres	317 acres
2. Summarized description of the recommended boundary	<p>The area consists of three separate parts that are adjacent to the Mission Mountains Wilderness. The northern part follows the Mission Mountains Wilderness Addition Inventoried Roadless Area #01503 adjacent to the Mission Mountains Wilderness on the western boundary. The northern boundary is a section line; the southern and eastern boundaries cannot be physically discerned on the ground. For the middle part, the northern boundary follows the Northside of Cold Creek and then follows the boundary of the Mission Mountains Wilderness Addition Inventoried Roadless Area #015104. The southern part is in the headwaters of Cold Jim Creek. The western and southern boundaries are adjacent to the Mission Mountains Wilderness and part of the Mission Mountains Wilderness Addition Inventoried Roadless Area #01505. The eastern boundary follows the contour line. There are no roads or trails in this part of the area.</p>
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes subalpine fir, Douglas-fir, western larch, and lodgepole pine. The area has gentle to moderate slopes and is heavily timbered. There is no ridgetop or mountaintop in the area, but the highest elevation is about 6,300 feet.
4. Current uses and management	<p>The 1986 forest plan direction is primarily managed for timber production. About 80 percent of the area is within the following inventoried roadless areas: Mission Mountains Wilderness Addition Inventoried Roadless Area #01503 (15 percent), Mission Mountains Addition Inventoried Roadless Area #01504 (35 percent), and Mission Mountains Wilderness Addition Inventoried Roadless Area #01505 (30 percent). The primary recreation opportunity spectrum class for summer is semiprimitive nonmotorized. The primary winter recreation opportunity spectrum class is semiprimitive motorized.</p> <p>The area has < 1 mile existing roads that are closed yearlong. The area has 317 acres suitable for motorized over-snow vehicle use December 1 through March 31.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	Natural quality —The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.

Factors	Description
	<p>Undeveloped quality—The majority of this area is undeveloped as about 80 percent of the area is within the three inventoried roadless areas. The area has < 1 mile miles of existing roads closed yearlong.</p> <p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities: hiking, backpacking, fishing, wildlife viewing, camping, snowshoeing, and backcountry skiing.</p> <p>Solitude—There is outstanding opportunity for solitude as the sights and sounds of human activities and improvements are screened by topography or do not have an impact due to distance. In winter, motorized over-snow vehicle use can reduce opportunities for solitude.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high; 80 percent of the area is within inventoried roadless areas. This area is adjacent to the Mission Mountains Wilderness. The boundaries of the three areas could present a challenge for managers because they are not always based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to the Mission Mountains Wilderness and within inventoried roadless areas. ○ This area is adjacent to the Mission Mountains Wilderness and would expand the Mission Mountains Wilderness by 317 acres. ○ This area represents an opportunity to add 186 acres of underrepresented ecosystems to the National Wilderness Preservation System. ○ Jim and Cold Creeks support bull trout and westslope cutthroat trout. ○ There is very high and high value lynx habitat, and the area provides high connectivity for wolverines between the Mission Mountains and Swan Ranges and key habitat for grizzly bear.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, wolverine, lynx, bull trout, and westslope cutthroat trout. ○ the undeveloped quality of the area because this area is primarily unroaded; there are no system trails within this area. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ very high opportunity for solitude in the summer and high opportunity in the winter as 100 percent of the area is suitable for motorized over-snow vehicle use, which can reduce opportunities for solitude. ○ outstanding primitive and/or unconfined recreation opportunities for hiking, backpacking, fishing, wildlife viewing, camping, snowshoeing, and backcountry skiing.

Elk Creek Recommended Wilderness Area

This recommended wilderness area is derived from the Elk Creek wilderness inventory area.

Table 4-216. Elk Creek recommended wilderness area

Factors	Description
1. Acres	2,964 acres
2. Summarized description of the recommended boundary	The western boundary is the existing Mission Mountains Wilderness. The northern boundaries are along section lines, harvest units, and two road spurs that are closed yearlong (Roads #91280 and #91299). The eastern and southern boundaries follow section lines.
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes lodgepole pine, Douglas-fir, western larch, and subalpine fir. This area is heavily timbered. This area has moderate slopes. No mountaintop occurs in the area, but the highest ridge point is about 6,800 feet.
4. Current uses and management	The 1986 forest plan direction is primarily for timber production. The recreation opportunity spectrum class is semiprimitive nonmotorized for both summer and winter. About 4 percent of the area is within the Mission Mountains Wilderness Addition Inventoried Roadless Area #01506. The area has 1 mile of nonmotorized trail that allows mechanized transport in the northwestern corner.
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. The area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention. There is a visible old dozer firebreak along the ridge in the southern portion that has been rehabilitated.</p> <p>Undeveloped quality—This area is undeveloped and has only 1 mile of nonmotorized trail, which allows mechanized transport.</p> <p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities for fishing, paddling, hiking, backpacking, snowshoeing, and backcountry skiing.</p> <p>Solitude—There is outstanding opportunity for solitude as the sights and sounds of human activities and improvements are screened well by topography or do not have an impact due to distance.</p> <p>Other features of value—Elk Creek is the most productive stream for the threatened bull trout in the Swan River watershed.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is very high. This area is adjacent to the Mission Mountains Wilderness. The current boundary may pose a challenge to managers because the northern boundaries are along section lines, harvest units, and two road spurs and the eastern and southern boundaries follow section lines and are not generally based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> There is public interest in recommended wilderness areas adjacent to the Mission Mountains Wilderness and within inventoried roadless areas.

Factors	Description
	<ul style="list-style-type: none"> o This area is adjacent to the Mission Mountains Wilderness and would expand it by 2,964 acres. o Elk Creek is the most productive stream for the threatened bull trout in the entire Swan River watershed and is an eligible wild and scenic river with the outstandingly remarkable value for fish. o There is high and very high quality habitat for lynx in this area. o This area has secure core for grizzly bear. o This area represents an opportunity to add 2,689 acres of underrepresented ecosystems to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> o the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, contains many indigenous species such as the grizzly bear, lynx, bull trout, and westslope cutthroat trout, and Elk Creek is the most productive stream for the threatened bull trout in the Swan River watershed; and o the undeveloped quality of the area because this area is unroaded and has < 1 mile of nonmotorized trail, which allows mechanized transport, and no other development. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> o outstanding opportunities for solitude and o outstanding opportunities for primitive and/or unconfined recreation such as fishing, paddling, hiking, backpacking, snowshoeing, and backcountry skiing.

Essex Recommended Wilderness Area

This recommended wilderness area is derived from the Essex wilderness inventory area.

Table 4-217. Essex recommended wilderness area

Factors	Description
1. Acres	13,788 acres
2. Summarized description of the recommended boundary	This recommended wilderness area is comprised of eight parts that are all adjacent to the Great Bear Wilderness. The boundary generally follows that of the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485, with some minor deviations to extend the boundary to section lines or decommissioned roads.
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes Douglas-fir, lodgepole pine, subalpine fir, and western larch. This area is heavily timbered, with sparse vegetation at high elevations and in avalanche chutes. This area contains very steep to steep slopes. An unnamed mountaintop at 7,700 feet is the highest point in the area.
4. Current uses and management	The 1986 forest plan primary direction is timber with special consideration for sensitive soils and watershed values and unroaded lands suitable for dispersed recreation in a semiprimitive motorized

Factors	Description
	<p>class. The primary class is semiprimitive nonmotorized in the summer and semiprimitive motorized in the winter. About 92 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.</p> <p>There are 9 miles of nonmotorized trails, of which 5 miles allow mechanized transport, and 9,698 acres (70 percent) of the area is suitable for motorized over-snow motorized vehicle use December 1 through March 31.</p>
<p>5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics</p>	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped, with 9 miles of nonmotorized trail, of which 5 miles allow mechanized transport. This area is close to the U.S. Highway 2 corridor and includes a railroad corridor and private property.</p> <p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities for hiking, backpacking, horseback riding, fishing, hunting, and cross-country and backcountry skiing.</p> <p>Solitude—Portions of this area provide for high to very high opportunities for solitude in summer; especially as one moves away and upslope from the U.S. Highway 2 corridor so that the sights and sounds of human activities and improvements are screened by topography or have little impact due to distance. In winter, 70 percent of the area is available for motorized over-snow vehicle use, which can reduce opportunities for solitude.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high. This area is adjacent to the Great Bear Wilderness. The current boundary may pose a challenge to managers as portions of the boundaries not adjacent to the Great Bear Wilderness are along section lines, harvest units, and road spurs and are not generally based on natural features that are locatable on the map or on the ground.</p>
<p>6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)</p>	<ul style="list-style-type: none"> ○ There is public interest in recommend wilderness areas adjacent to the Great Bear Wilderness and within inventoried roadless areas. ○ This area is adjacent to the Great Bear Wilderness and would expand the existing wilderness by 13,788 acres ○ There are pure populations of westslope cutthroat trout present throughout the area. ○ Most of this area has been identified as security core area for grizzly bears, and this area has numerous avalanche chutes, which are a primary habitat component for grizzlies. Nearly all of this area has been identified as high-value maternal habitat for wolverine. ○ There is key habitat for mountain goats in the steeper areas of this area. ○ This area represents an opportunity to add 4,235 acres of underrepresented ecosystems to the National Wilderness Preservation System.

Factors	Description
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as grizzly bear, mountain goat, wolverine, and westslope cutthroat trout; and the undeveloped quality of the area because this area is unroaded and has no development. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> high to very high opportunities for solitude. outstanding primitive and/or unconfined recreation opportunities for hiking, backpacking, horseback riding, fishing, hunting, and cross-country and backcountry skiing.

Fatty-Woodard Recommended Wilderness Area

This recommended wilderness area is derived from portions of the Fatty Creek and Woodward wilderness inventory areas.

Table 4-218. Fatty-Woodward recommended wilderness area

Factors	Description
1. Acres	2,133 acres
2. Summarized description of the recommended boundary	<p>This recommended wilderness area is comprised of three parts that are all adjacent to the Mission Mountains Wilderness:</p> <ul style="list-style-type: none"> The northern part lies between the Swan River State Forest and the Mission Divide (Flathead Indian Reservation is on the west side of the divide). The southern boundary is adjacent to the Mission Mountains Wilderness, the eastern boundary is the Swan River State Forest, the western boundary is the Mission Divide (Flathead Indian Reservation), and the northern boundary generally follows a section line. This part follows boundaries of the Mission Mountains Wilderness Addition Inventoried Roadless Area #01500. The middle part is a triangle-shaped area whose western boundary is adjacent to the Mission Mountains Wilderness; the northern boundary is the Swan River State Forest, and the eastern boundary heads southwest from the northeastern edge of the area across the landscape to the Mission Mountains Wilderness. It generally follows boundaries of the Mission Mountains Wilderness Addition Inventoried Roadless Area #01501. For the southern area, the western boundary is the Mission Mountains Wilderness and the northern, eastern, and southern boundaries generally follow contour lines.
3. Brief description of the general geography, topography, and vegetation	<p>The topography is rolling foothills to moderately steep slopes. This area is heavily to moderately timbered, and the existing vegetation is primarily subalpine fir, lodgepole pine, western larch, whitebark pine, and western redcedar in mature/old forest near Fatty Creek. The ridge along the Mission Divide in the northern part of the area, at 7,200 feet, is the highest point in the area.</p>

Factors	Description
4. Current uses and management	<p>The 1986 forest plan direction is primarily unroaded lands suitable for dispersed recreation in a primitive class. About 53 percent of the area is within the following inventoried roadless areas: Mission Mountains Addition Inventoried Roadless Area #01500 (38 percent) and the Mission Mountains Addition Inventoried Roadless Area #01501 (15 percent). The primary summer class is semiprimitive nonmotorized, and the primary winter class is semiprimitive motorized.</p> <p>The area is suitable on 1,962 acres (92 percent) for over-snow motorized vehicle use December 1 through March 31.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—This area is undeveloped and has no trail or other development.</p> <p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities for hiking, backpacking, snowshoeing, wildlife observation, fishing, and hunting.</p> <p>Solitude—There is a very high opportunity for solitude in this area during the summer as it is adjacent to the Mission Mountains Wilderness, the Flathead Indian Reservation, and Swan River State Forest, and the sights and sounds of human activities and improvements are screened by topography or have little impact due to distance. In winter, motorized over-snow vehicle use can reduce opportunities for solitude.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high. This area is adjacent to the Mission Mountains Wilderness. The current boundary may pose a challenge to managers because portions of the boundaries not adjacent to the Mission Mountains Wilderness generally follow a contour line and are not based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to the Mission Mountains Wilderness and within inventoried roadless areas. ○ This area is adjacent to the Mission Mountains Wilderness and would expand the existing wilderness by 2,133 acres. ○ This area represents an opportunity to add 1,087 acres of underrepresented ecosystems to the National Wilderness Preservation System. ○ Woodward Creek has west-slope cutthroat trout and bull trout. ○ The area has high and very high quality lynx habitat.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, bull trout and westslope cutthroat trout; and

Factors	Description
	<ul style="list-style-type: none"> the undeveloped quality of the area because this area is unroaded with no development. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> very high opportunities for solitude in the summer, but in the winter the area is suitable for motorized over-snow vehicle use, which can reduce opportunities for solitude; and outstanding primitive and/or unconfined recreation opportunities for hiking, backpacking, horseback riding, fishing, hunting, and backcountry skiing.

Hungry Horse East Recommended Wilderness Area

This recommended wilderness area is derived from portions of the Hungry Horse East and Bob North wilderness inventory areas.

Table 4-219. Hungry Horse East recommended wilderness area

Factors	Description
1. Acres	33,503 acres
2. Summarized description of the recommended boundary	This area is adjacent to the Great Bear Wilderness. The northern boundary is adjacent to the Essex recommended wilderness area, and the southern boundary is South Creek. The western boundary generally follows the boundaries of the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485 as well as roads and previous harvest units.
3. Brief description of the general geography, topography, and vegetation	The existing vegetation is Douglas-fir, subalpine fir, western larch, and lodgepole. The slopes are very steep to steep, heavily timbered with south-facing slopes more open. There is sparse vegetation on ridgetops and mountaintops. The highest elevation point is Mount Baptiste at 8,400 feet.
4. Current uses and management	<p>The 1986 forest plan direction is primarily unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of semiprimitive nonmotorized. The primary summer and summer recreation opportunity spectrum class is semiprimitive nonmotorized. About 89 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area.</p> <p>There are 5 miles of existing closed yearlong roads and 11 miles of historical roads that are not on the system in the area. There are 22 mile of nonmotorized trails, with 19 of those miles allowing mechanized transport. The area has 9,586 acres (29 percent) suitable for motorized over-snow vehicle use December 1 through March 31.</p> <p>This area contains Baptiste Lookout, which is a functioning fire lookout.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics.	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—This area is primarily undeveloped, with 5 miles of existing closed yearlong roads and 22 miles of nonmotorized trails.</p>

Factors	Description
	<p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities for hiking, backpacking, horseback riding, fishing, hunting, and gathering forest products such as huckleberries. Winter recreation opportunities include cross-country and back-country skiing and snowshoeing.</p> <p>Solitude—This area provides outstanding opportunities for solitude. The majority of the eastern boundary is adjacent to the Great Bear Wilderness, and a large portion of the area is within an inventoried roadless area. With much of the area moderately steep to very steep and ranging from heavily timbered to subalpine landforms, sights and sounds are buffered and allow for the feeling of solitude. As one moves downslope towards Hungry Horse Reservoir, there may occasionally be sights and sounds from Hungry Horse Reservoir and Hungry Horse NFS Road 38.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high. This area is adjacent to the Great Bear Wilderness. The current boundary may pose a challenge to managers as the western boundary generally follows roads and previously harvested areas and is not generally based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to the Great Bear Wilderness and within inventoried roadless areas. ○ This area is adjacent to the Great Bear Wilderness and would expand the wilderness by 33,503 acres. ○ Pure populations of westslope cutthroat trout are abundant. ○ There are high amounts of wolverine maternal denning habitat. ○ Twin Creek has a harlequin duck pair. ○ Several streams within this area have bull trout. ○ This area represents an opportunity to add 8,715 acres of underrepresented ecosystems to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as grizzly bear, wolverine, westslope cutthroat trout, and bull trout. ○ the undeveloped quality of the area is high because this area is mostly unroaded (5 miles of roads that are closed yearlong), with little development except the Baptiste Lookout and 22 miles of nonmotorized trails. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ very high opportunities for solitude in the summer as there are no motorized trails. In the winter, the area is suitable for motorized over-snow vehicle use, which can reduce opportunities for solitude.

Factors	Description
	<ul style="list-style-type: none"> o outstanding primitive and/or unconfined recreation opportunities for hiking, backpacking, horseback riding, fishing, hunting, gathering forest products such as huckleberries, snowshoeing, and cross-country and backcountry skiing.

Java-Bear Recommended Wilderness Area

This recommended wilderness area is derived from the Essex wilderness inventory area.

Table 4-220. Java-Bear Creek recommended wilderness area

Factors	Description
1. Acres	3,725 acres
2. Summarized description of the recommended boundary	<p>The recommended wilderness area is separated into two parts, both of which are adjacent to the existing Great Bear Wilderness</p> <ul style="list-style-type: none"> o The western part's southwestern boundary is adjacent to the Great Bear Wilderness. This boundary follows the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485 boundary to the Middle Fork of the Flathead River. The eastern boundary follows the Sheep-Elk Loop Trail #152/#62 and the Logan Dirty Face Trail #62. This area is west of the Middle Fork of the Flathead River. o The eastern part's eastern and southern boundaries are adjacent to the Great Bear Wilderness and generally follow the Marshall-Scapegoat-Swan Inventoried Roadless Area #1485 boundary. This area is east of the Middle Fork of the Flathead River and south of Bear Creek and U.S. Highway 2.
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes Douglas-fir, lodgepole pine, subalpine fir, and western larch. In higher elevations there is sparse vegetation. The area has very steep slopes and is heavily timbered. The highest point in this area is 6,800 feet.
4. Current uses and management	<p>The 1986 forest plan direction is primarily unroaded lands suitable for dispersed recreation that meet the recreation opportunity spectrum class of semiprimitive nonmotorized. The primary summer and summer recreation opportunity spectrum class is semiprimitive nonmotorized. About 94 percent of this area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.</p> <p>The area has 4 miles of nonmotorized trails, with 3 mile allowing mechanized transport. The area has 562 acres (15 percent) suitable for motorized over-snow vehicle use December 1 through March 31.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—This area is primarily undeveloped, with 4 miles of nonmotorized trails.</p> <p>Unconfined and/or primitive recreation—The area offer opportunities for hiking, backpacking, horseback riding, fishing, hunting, and cross-country and backcountry skiing. Fifteen percent of the area is suitable for motorized over-snow vehicle use.</p> <p>Solitude—In summer, very high opportunities for solitude exist. In winter, there is a small area of over-motorized over-snow vehicle use (562 acres) in the northeast corner that may affect winter solitude, but this would not be pervasive throughout the</p>

Factors	Description
	<p>area. Depending on how close one is to the U.S. Highway 2 corridor, solitude can range from moderate close to the corridor to very high as one travels away from the corridor.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is moderate. This area is adjacent to the Great Bear Wilderness, and about 94 percent of this area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The current boundary may pose a challenge to managers because it is not always based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> o There is public interest in recommended wilderness areas adjacent to existing designated wilderness and within inventoried roadless areas. o This area is adjacent to the Great Bear Wilderness and would increase it by 3,725 acres. o The area includes high habitat for wolverine, mountain goat, and grizzly bear. o Bull trout and west slope cutthroat trout are in Bear Creek. o This area represents an opportunity to add 1,157 acres of underrepresented ecosystems to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> o the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, mountain goat, wolverine, west slope cutthroat trout, and bull trout; and o the undeveloped quality of the area because this area is unroaded and has 4 miles of nonmotorized trails. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> o opportunities for solitude are very high, and closer to the U.S. Highway 2 corridor, opportunities for solitude are moderate to high; and o outstanding primitive and/or unconfined recreation opportunities for hiking, backpacking, horseback riding, fishing, hunting, cross-country skiing, and backcountry skiing.

Jewel Basin-Swan Crest Recommended Wilderness Area

This recommended wilderness area is derived from the Bob North and Hungry Horse West wilderness inventory areas.

Table 4-221. Jewel Basin-Swan Crest recommended wilderness area

Factors	Description
1. Acres	135,759 acres

Factors	Description
2. Summarized description of the recommended boundary	<p>Irregular area that generally follows the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485 and goes from the ridgetop near Doris Mountain south to Thunderbolt Mountain.</p> <p>The southern boundary is adjacent to the Alcove-Bunker recommended wilderness area. The northern boundary is the lower slope of Doris Mountain in the Badrock Canyon area. On the eastern boundary, the boundary meanders around roaded and previously harvested areas, and there are numerous road intrusions (Quintonkon, Wheeler, Graves, Lost Johnny, and Doris) that penetrate into the area but are excluded from the recommended wilderness area.</p>
3. Brief description of the general geography, topography, and vegetation	<p>Existing vegetation is subalpine fir, Douglas-fir, lodgepole pine, whitebark pine, and western larch. The area is heavily timbered to open meadows and rocky outcrops, with steep to very steep slopes, and the highest elevation is Thunderbolt Mountain at 7,900 feet.</p>
4. Current uses and management	<p>The 1986 forest plan primary management direction is unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of semiprimitive motorized and the Jewel Basin Hiking Area direction. The primary summer recreation opportunity spectrum class is semiprimitive nonmotorized. The primary winter recreation opportunity spectrum class is semiprimitive motorized. About 92 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area.</p> <ul style="list-style-type: none"> ○ This area includes the Jewel Basin Hiking Area, where motorized use, mechanize transport, and pack and stock animals are prohibited. About 24 percent of this area contains the 1986 Jewel Basin recommended wilderness area. ○ The area has 17 miles of system roads that are closed yearlong and 18 miles of historical roads that are not on the system. ○ There are 184 miles of trails; 75 miles of these allow wheeled motorized use and mechanized transport, 72 miles of nonmotorized trails allow mechanized transport, and 37 miles of nonmotorized trails do not allow mechanized transport. ⇒ The area is suitable for motorized over-snow vehicle use on 82,543 acres December 1 through March 31; 3,114 acres December 1 through April 30; and 18,332 acres December 1 through May 31.
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—This area has high undeveloped qualities as this area contains 17 miles of system roads that are closed yearlong, 75 miles of motorized trails, and 109 miles of nonmotorized trails.</p> <p>Unconfined and/or primitive recreation—Outstanding opportunities exist for primitive recreation, including hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, snowshoeing, and cross-country and backcountry skiing. About 77 percent of this area is suitable for motorized over-snow vehicle use.</p> <p>Solitude—There is very high opportunity for solitude in this area during the summer and high opportunity for solitude in the winter, although mainline trails within the Jewel Basin Hiking Area have high levels of use on weekends and holidays.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is moderate to high. The current boundary may pose a challenge to managers as there are numerous motorized corridors that extend into and/or are adjacent to the area (Quintonkon, Wheeler, Graves, Lost Johnny, and Doris) that are excluded. Much of the boundary generally follows roads and previously harvested areas and is not generally based on natural features that are locatable on the map or on the ground.</p>

Factors	Description
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> There is high public interest in recommended wilderness for the Jewel Basin Hiking Area and surrounding lands. There is public interest in recommended wilderness areas within inventoried roadless areas. Twenty-four percent of this area was recommended wilderness in the 1986 forest plan. Ninety-two percent of this area is the Jewel Basin Hiking Area. Bull trout and west slope cutthroat trout are in Sullivan, Quintonkon, Wheeler, and Wounded Buck Creeks. This area contains wolverine maternal denning habitat, has high and very high quality lynx habitat, and is generally considered to provide travel corridors for lynx along the western side. The area has high-quality grizzly bear habitat for feeding/denning/security (avalanche chutes), important spring habitat for grizzly bears, and mountain goat habitat in the Jewel Basin Hiking Area. Aeneas Creek, which runs through this area, is an eligible wild and scenic river. This area represents an opportunity to add 62,378 acres of underrepresented ecosystems to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as grizzly bear, lynx, wolverine, mountain goat, and bull trout; and the undeveloped quality of the area is high because this area is unroaded and has very limited developments. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> very high opportunities for solitude and primitive and/or unconfined recreation for hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, snowshoeing, and cross-country and backcountry skiing.

Le Beau Recommended Wilderness Area

This recommended wilderness area is derived from the Le Beau Creek wilderness inventory area.

Table 4-222. Le Beau recommended wilderness area

Factors	Description
1. Acres	5,950 acres
2. Summarized description of the recommended boundary	The western boundary follows the research natural area/Forest boundary (the divide between Sunday Creek and Le Beau Creek), the eastern boundary generally follows the Forest Service administrative boundary, and the southern boundary follows the Le Beau Research Natural Area boundary.
3. Brief description of the general geography, topography, and vegetation	The topography of the Le Beau area is characterized by ridgetops and cliffs formed by glacial scouring and has gentle to moderate slopes. The existing vegetation includes Douglas-fir, western larch, and a small amount of ponderosa pine.

Factors	Description
	Ketawke Mountain at 5,635 feet is the highest elevation in the area. Unique geological features include obvious evidence of glacial activity, with glacial grooves and striations on cliffs and exposed ridgetops in the area, and large amounts of limestone bedrock in the drainages. Large canyons in the area are often bordered by rock cliffs of sandstone, mudstone, and limestone.
4. Current uses and management	<p>The 1986 forest plan management direction is management of the Le Beau Research Natural Area. The primary summer and winter recreation opportunity spectrum class is semiprimitive nonmotorized. About 92 percent of the area is within the Le Beau Inventoried Roadless Area.</p> <p>The area has 1 mile of existing closed yearlong roads, 3 miles of trail allowing mechanized transport, and 252 acres that are suitable for motorized over-snow vehicle use and are open yearlong.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The undeveloped quality of the area is high as there is little development in the form of trails.</p> <p>Unconfined and/or primitive recreation—Camping, hiking, fishing, and hunting opportunities exist in the area.</p> <p>Solitude—The majority of this area lies within an inventoried roadless area and provides outstanding opportunities for solitude. Additionally, the combination of topography and vegetation allows for a high degree of screening, diminishing noise from U.S. Highway 93 on the northern boundary and from the Burlington Northern Railroad.</p> <p>Other features of value—Unique geological features include evidence of glacial activity, with glacial grooves and striations on cliffs and exposed ridgetops in the area, and large amounts of limestone bedrock in the drainages. Large canyons in the area are often bordered by rock cliffs of sandstone, mudstone, and limestone.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is very high. This majority of this area has been managed as an inventoried roadless area and research natural area. The eastern and southern boundaries may pose a challenge to managers as they are not generally based on natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ This area is in a key connectivity area for grizzly bears between the Northern Continental Divide Ecosystem and Cabinet-Yaak Ecosystem and has high grizzly bear habitat security. ○ Le Beau Creek is an eligible wild and scenic river. ○ The Le Beau Natural Research Area lies within this area. ○ This area represents an opportunity to add 4,962 acres of underrepresented ecosystems to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains indigenous species such as the grizzly bear; ○ the undeveloped quality of the area is high because this area is unroaded and has very few trails; and ○ the unique topography that has obvious evidence of glacial activity, with glacial grooves and striations on cliffs and exposed ridgetops in the area, and large amounts of limestone bedrock in the drainages. Large canyons in the area are often bordered by rock cliffs of sandstone, mudstone, and limestone. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p>

Factors	Description
	<ul style="list-style-type: none"> o opportunities for solitude and o primitive and/or unconfined recreation for camping, hiking, fishing, and hunting.

Limestone-Dean Ridge Recommended Wilderness Area

This recommended wilderness area is derived from the Bob North wilderness inventory area.

Table 4-223. Limestone-Dean Ridge recommended wilderness area

Factors	Description
1. Acres	26,294 acres
2. Summarized description of the recommended boundary	The northern and eastern boundaries are the Great Bear Wilderness, and the southern boundary is the Bob Marshall Wilderness. There is an exclusion consisting of Spotted Bear River NFS Road 568 buffered 33-feet on either side of the road that bisects the main lobe. The north end of the western boundary is bordered by NFS Road 2853. The area generally follows the boundaries of the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The southern boundary is adjacent to the Bob Marshall Wilderness, and the western boundary is the slopebreak where the slope changes from gentle to steep.
3. Brief description of the general geography, topography, and vegetation	Much of the area is moderately steep to very steep and ranges from heavily timbered to subalpine landforms to open south-facing slopes. Existing vegetation includes whitebark pine, subalpine fir, Douglas-fir, lodgepole pine, and western larch. The highest peak is Green Mountain at 7,418 feet. This area has a network of limestones caves near Sergeant Mountain and Spotted Bear Mountain.
4. Current uses and management	<p>The 1986 forest plan direction is primarily unroaded lands suitable for dispersed recreation that meet the recreation opportunity spectrum of primitive class. Approximately 19 percent of this area contains the 1986 Limestone Cave recommended wilderness. Approximately 99 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The primary summer recreation opportunity spectrum class is primitive, and the primary winter recreation opportunity spectrum class is semiprimitive nonmotorized</p> <p>The area has 31 miles of nonmotorized trails, with 27 miles allowing mechanized transport.</p> <p>The area contains the Spotted Bear Lookout, which is an active fire lookout at the end of Trail #84, which allows mechanized use. The lookout is also an electronic site.</p>
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. The area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped. Within this area there are 31 miles of nonmotorized trails.</p> <p>Unconfined and/or primitive recreation—Primitive recreation activities in this area include horseback riding, hiking, backpacking, fishing, hunting, wildlife viewing, and cross-country skiing.</p> <p>Solitude—This area provides outstanding opportunities for solitude. With much of the area moderately steep to very steep and ranging from heavily timbered to subalpine landforms, sights and sounds are buffered.</p>

Factors	Description
	<p>Other features of value—Whitebark pine trees with apparent natural resistance to blister rust occur within the upper reaches of Big Bill Creek and provide seed for whitebark pine restoration programs. A network of limestones caves, which has had ongoing exploration of the cave system for many years, provides scientific and educational value.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is very high. About 19 percent of this area contains the 1986 forest plan Limestone Cave recommended wilderness, and this area is 99 percent within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The northern, eastern, and southern boundaries are adjacent to existing wilderness and are based on natural features that are locatable on the map or on the ground.</p>
<p>6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)</p>	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to existing designated wilderness and within inventoried roadless areas. ○ A portion (19 percent) of this area contains the 1986 forest plan Limestone Cave recommended wilderness. ○ The area is adjacent to the Great Bear and Bob Marshall Wildernesses and expands the Bob Marshall Wilderness Complex by 26,294 acres. ○ The area contains a stream reaches that has consistently high production of harlequin duck broods. ○ There are strong populations of bull trout in Spotted Bear River and tributaries as well as genetically pure westslope cutthroat trout in many streams throughout this area. ○ There is high and very high quality lynx habitat, and there is mountain goat habitat in the area. ○ A portion of the area has maternal denning habitat for wolverine, and a majority of the area contains high or very high quality grizzly bear habitat. ○ The area includes a portion of the Spotted Bear River, which is an eligible wild and scenic river. ○ The area represents an opportunity to add 4,650 acres of underrepresented ecological groups to the National Wilderness Preservation System.
<p>7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System</p>	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as grizzly bear, lynx, wolverine, mountain goat, bull trout, and western cutthroat trout; ○ the undeveloped quality of the area is high because this area is unroaded, has no development, and has 31 miles of nonmotorized trails; and ○ the unique ecological features of the genetically superior whitebark pine trees identified in the upper reaches of Big Bill Creek and the network of limestones caves that has had ongoing exploration and provides scientific and educational value. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ outstanding opportunities for solitude and ○ primitive and/or unconfined recreation for hunting, horseback riding, fishing, hiking, and wildlife viewing.

Piper Creek Recommended Wilderness Area

This recommended wilderness area is derived from the Piper Creek wilderness inventory area.

Table 4-224. Piper Creek recommended wilderness area

Factors	Description
1. Acres	642 acres
2. Summarized description of the recommended boundary	This recommended wilderness area is one complete section (Township 22 North, Range 18 West, section 26). Its boundary follows the Mission Mountains Wilderness Addition Inventoried Roadless Area #01502. The western boundary is the Mission Mountains Wilderness, and the northern, eastern, and southern boundaries are section lines.
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes larch, lodgepole pine, and subalpine fir. Sites supporting mature/old western red cedar stands are present, which is a relatively uncommon forest type. The elevation is generally around 6,000 feet with gentle to moderate slopes.
4. Current uses and management	<p>The 1986 forest plan primary direction is timber production and unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of primitive. The primary summer recreation opportunity spectrum class is primarily semiprimitive nonmotorized, and the primary winter recreation opportunity spectrum class is semiprimitive motorized. About 94 percent of the area is within the Mission Mountain Wilderness Addition Inventoried Roadless Area #01502.</p> <ul style="list-style-type: none"> ○ This area is suitable for motorized over-snow vehicle use December 1 through March 31 on 511 acres. ○ One mile of the Piper Creek Trail allows mechanized transport.
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—There are no developments in this area.</p> <p>Unconfined and/or primitive recreation—Opportunities for hiking, backpacking, wildlife viewing, and fishing.</p> <p>Solitude—This area provides outstanding opportunities for solitude as it is unroaded and has one nonmotorized trail. In winter, 78 percent of the area is suitable to motorized over-snow vehicle use, which can reduce opportunities for solitude.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high. About 94 percent of this area is within the Mission Mountains Addition Inventoried Roadless Area #01502. The western boundary is adjacent to existing wilderness. The current northern, southern, and eastern boundaries may pose a challenge to managers as they are based on natural features that are locatable on the map but not the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to existing designated wilderness and within inventoried roadless areas. ○ This area is adjacent to the Mission Mountains Wilderness and would increase it by 642 acres. ○ This area supports bull trout and pure westslope cutthroat trout in Piper Creek.

Factors	Description
developing the alternative(s)	<ul style="list-style-type: none"> There is high and very high quality lynx habitat and high value for connectivity for wolverines between the Mission and Swan Ranges. This area represents an opportunity to add 576 acres of underrepresented ecological groups to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, wolverine, bull trout, and western cutthroat trout; and the undeveloped quality of the area is high because this area is unroaded. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> outstanding opportunities for solitude and opportunities for primitive and/or unconfined recreation for backpacking, hiking, fishing, and wildlife viewing.

Sky West Recommended Wilderness Area

This recommended wilderness area is derived from the Sky West wilderness inventory area.

Table 4-225. Sky West recommended wilderness area

Factors	Description
1. Acres	5,193 acres
2. Summarized description of the recommended boundary	<p>This area generally follows the boundary of the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485, with additional acreage in the Twenty-Five Mile Creek area</p> <ul style="list-style-type: none"> The northern part is adjacent to the Great Bear Wilderness and generally follows the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The northern boundary is adjacent to the U.S. Highway 2 corridor within 0.25 mile, the southeastern section of the southern boundary is adjacent to the Great Bear Wilderness, and the southwestern side is partly adjacent to private property and partly on contour lines not discernible on the ground. The eastern boundary is not discernible on the ground. The southern part generally follows the boundary of the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The western boundary is adjacent to the Great Bear Wilderness; the southern and eastern boundary borders past management harvest activities.
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes whitebark pine, subalpine fir, and lodgepole pine. The slopes in the area are moderate to steep and are heavily timbered, with some past fire openings. Baldhead Mountain at 7,794 feet is the highest elevation in this area.

Factors	Description
4. Current uses and management	<p>The 1986 forest plan primary direction is for unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of semiprimitive nonmotorized. The primary summer recreation opportunity spectrum class is semiprimitive nonmotorized, and the primary winter recreation opportunity spectrum class is semiprimitive motorized. About 90 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.</p> <ul style="list-style-type: none"> ○ The area has 3 miles of existing roads that are closed yearlong; 4 miles of nonmotorized trails allow mechanized transport. The area is suitable for motorized over-snow vehicle use on 4,263 acres December 1 through May 14, with the majority in the northern area. ○ The Patrol Ridge electronic site is planned to be moved from north of the road to south of the road, which would place the site within the Slippery Bill recommended wilderness area. Until then, the electronic site is within this recommended wilderness area.
5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped, although there is an electronic site at Patrol Ridge (which is planned to be relocated outside of the area). Within this area there are 3 miles of existing system roads that are closed yearlong and 4 miles of nonmotorized trails.</p> <p>Unconfined and/or primitive recreation—Opportunities include hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, cross-country and backcountry skiing, and snowshoeing.</p> <p>Solitude—Portions of the area provide outstanding opportunities for solitude, especially as one moves away from U.S. Highway 2. Eighty-four percent of the area is suitable for motorized over-snow vehicle use, which can reduce opportunities for solitude. This area is a popular late-season snowmobile area.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high. About 90 percent of this area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The boundaries may poses a challenge to managers; the northern, eastern, and western boundaries are partly adjacent to private property and partly on contour lines and do not generally use natural features that are locatable on the map or on the ground.</p>
6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)	<ul style="list-style-type: none"> ○ There is public interest in recommended wilderness areas adjacent to existing designated wilderness and within inventoried roadless areas. ○ This area is adjacent to the Great Bear Wilderness and would increase it by 5,193 acres. ○ This area has high value as connectivity habitat between Glacier National Park and the Flathead National Forest for wolverine and grizzly. This area has high and very high habitat quality for lynx; portions in the southern section provide maternal denning habitat for wolverine; and there is very high quality grizzly bear habitat. ○ This area represents an opportunity to add 302 acres of underrepresented ecological groups to the National Wilderness Preservation System.
7. Brief summary of the ecological and social characteristics that would	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p>

Factors	Description
provide the basis for suitability for inclusion in the National Wilderness Preservation System	<ul style="list-style-type: none"> the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, and wolverine; and the undeveloped quality of the area is high because this area is unroaded. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> very high to outstanding opportunities for solitude and opportunities for primitive and/or unconfined recreation for hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, snowshoeing, and cross-country and backcountry skiing.

Slippery Bill-Puzzle Recommended Wilderness Area

This recommended wilderness area is derived from the Puzzle wilderness inventory area.

Table 4-226. Slippery Bill-Puzzle recommended wilderness area

Factors	Description
1. Acres	20,703 acres
2. Summarized description of the recommended boundary	Generally, this area follows the boundary of the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485 and is irregularly shaped. The southern boundary is the Great Bear Wilderness, and the eastern boundary is the Continental Divide as well as the administrative boundary between the Flathead National Forest and the Helena-Lewis and Clark National Forest. The northern boundary is along the U.S. Highway 2 corridor (0.25 mile away), and the western boundary meanders around roads and harvest units.
3. Brief description of the general geography, topography, and vegetation	Existing vegetation includes whitebark pine, lodgepole pine, and subalpine fir. The area has moderate to heavy timber with open south slopes and gentle to steep slopes. Bullshoe Mountain at 7,900 feet is the highest point.
4. Current uses and management	<p>The 1986 forest plan primary management direction is unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of semiprimitive nonmotorized. About 26 percent of this area is the 1986 forest plan's Slippery Bill recommended wilderness area. About 97 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The primary summer and winter recreation opportunity spectrum class is semiprimitive nonmotorized.</p> <ul style="list-style-type: none"> The area has 17 miles of trails, with 16 of those miles allowing mechanized transport. The area is suitable for motorized over-snow vehicle use on 5,313 acres (26 percent) December 1 through May 14 and is a popular late-season snowmobile area. The Patrol Ridge electronic site is currently north of the road in the Sky West recommended wilderness area and is planned to be moved to a site south of the road, which would locate it within this recommended wilderness area.

Factors	Description
<p>5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics</p>	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. This area has mostly intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped. Within this area, there are 17 miles of nonmotorized trails. The Patrol Ridge electronic site may be moved to this area.</p> <p>Unconfined and/or primitive recreation—Opportunities include hiking, backpacking, horseback riding, hunting, fishing, forest product gathering, and cross-country and backcountry skiing.</p> <p>Solitude—This area provides for outstanding opportunities for solitude as it is unroaded and has one nonmotorized trail. In winter, 78 percent of the area is suitable to motorized over-snow vehicle use, which can reduce opportunities for solitude. The area is remote, especially close to the Continental Divide. Motorized over-snow vehicle use is suitable on 26 percent of the area, and the late season use is moderate to high, which can affect opportunities for solitude.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high. About 97 percent of this area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The northern boundary is along the U.S. Highway 2 corridor (0.25 mile away), and the western boundary meanders around roads and harvest units and may pose a challenge to managers as it is not always based on natural features that are locatable on the map or on the ground.</p>
<p>6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)</p>	<ul style="list-style-type: none"> o There is public interest in recommended wilderness areas adjacent to existing designated wilderness and within inventoried roadless areas. o This area is adjacent to the Great Bear Wilderness and would increase it by 20,703 acres. o This area includes 100 percent of the 1986 Slippery Bill recommended wilderness area. o Morrison, Granite, and Twenty-Five Mile Creeks support bull trout and native westslope cutthroat trout. o The southern portion (the area around Crescent Cliff) is mountain goat habitat. The majority of this area is maternal denning habitat for wolverine. o This area contains high quality grizzly bear habitat. o The area provides high and very high quality lynx habitat. o This area represents an opportunity to add 263 acres of underrepresented ecological groups to the National Wilderness Preservation System.

Factors	Description
7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, wolverine, mountain goats, bull trout and western cutthroat trout; and the undeveloped quality of the area is high because this area is unroaded. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> very high to outstanding opportunities for solitude and opportunities for primitive and/or unconfined recreation for hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, cross-country and backcountry skiing, and snowshoeing.

Swan Front Recommended Wilderness Area

This recommended wilderness area is derived from the Swan Face South wilderness inventory area.

Table 4-227. Swan Front recommended wilderness area

Factors	Description
1. Acres	48,151 acres
2. Summarized description of the recommended boundary	<p>This area generally follows the boundary of the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485.</p> <p>The southern boundary is the boundary between the Flathead National Forest and the Lolo National Forest and follows a ridgeline. The northern boundary is adjacent to the Alcove Bunker recommended wilderness area and follows the ridgeline from Inspiration Point to a section line. A portion of the boundary is adjacent to the Swan River State forest. The eastern boundary is adjacent to the Bob Marshall Wilderness. Some portions of the western boundary extend farther west than the existing Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485 boundary, past harvest areas and roads, and a portion of the western boundary follows the contour break.</p>
3. Brief description of the general geography, topography, and vegetation	<p>The area includes steep ridges, and a continuous chain of high and often treeless, rugged mountains forms the eastern boundary. Below the high peaks is the canyon zone, where the streams of the face plunge down narrow bottoms between steep sideslopes until they reach the valley floor. Rocks and cliffs prevail in much of the canyon zone.</p> <p>The existing vegetation is subalpine fir, lodgepole pine, Douglas-fir, whitebark pine, and western larch.</p> <p>The highest point in this area is Holland Peak at 9,356 feet.</p>
4. Current uses and management	<p>The 1986 forest plan primary direction is unroaded lands suitable for dispersed recreation that meets the recreation opportunity spectrum class of primitive. Virtually all of the 1986 of the Swan Front Recommended Wilderness Area is within this area. About 93 percent of the area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The primary summer and winter recreation opportunity spectrum class is primitive.</p> <ul style="list-style-type: none"> The area has 1 mile of existing closed yearlong roads and 27 miles of trails with 4 miles that allow mechanized transport. The area is suitable for motorized over-snow vehicle use on 2,761 acres (6 percent) December 1 through March 31 (6 percent).

Factors	Description
	<ul style="list-style-type: none"> This area contains Holland Lookout, which is a functioning lookout that is not staffed full-time during the summer but is only used as needed.
<p>5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics</p>	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. Most of this area has intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped. Within this area, there are 27 miles of nonmotorized trails. The Holland Lookout is within this area.</p> <p>Unconfined and/or primitive recreation—This area has an outstanding amount of unconfined and primitive recreation opportunities for hiking, horseback riding, fishing, and big-game hunting, camping, backpacking, and viewing wildlife.</p> <p>Solitude—There is outstanding opportunity for solitude as the sights and the sounds of human activities and improvements are screened by topography or do not have an impact due to distance. The western boundary is adjacent to private land, which might reduce opportunities for solitude. Napa Point, Smith Creek, and Holland Lake Trails are major access points to the Bob Marshall Wilderness, which has high use during the summer and fall seasons.</p> <p>Other features of value—None.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high. About 93 percent of this area is within the Bear-Marshall-Scapegoat-Swan Inventoried Roadless Area #1485. The western boundary meanders around roads, private property, contour lines, and harvest units and may pose a challenge to managers as they are not always based on natural features that are locatable on the map or on the ground.</p>
<p>6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)</p>	<ul style="list-style-type: none"> There is high public interest in recommending this area as well as wilderness areas adjacent to existing designated wilderness and within inventoried roadless areas. This area would expand the Bob Marshall Wilderness area by 48,151 acres. The North and South Forks of Lost Creek are spawning streams for bull trout. The South Fork of Lost Creek contains pure populations of westslope cutthroat trout. Lower Holland Falls has the only known nesting colony of black swifts on the Forest. There is high value grizzly bear connectivity and high and very high grizzly bear habitat quality, particularly in the avalanche chutes in the headwaters of the South Fork of Lost Creek. The area has a putative lynx travel corridor along its western edge, and most of the area provides maternal denning habitat for wolverine. Lion Creek is an eligible wild and scenic river within this area. The area represents the opportunity to add 14,432 acres of underrepresented ecological groups to the National Wilderness Preservation System. There is a population of whitebark pine.
<p>7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for</p>	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, wolverine, bull trout, and western cutthroat trout; and

Factors	Description
inclusion in the National Wilderness Preservation System	<ul style="list-style-type: none"> the undeveloped quality of the area is high because this area is unroaded. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> outstanding opportunities for solitude and primitive and/or unconfined recreation opportunities for hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, cross-country and backcountry skiing, and snowshoeing.

Tuchuck–Whale Recommended Wilderness Area

This recommended wilderness area is derived from portions of the Tuchuck and Whale wilderness inventory areas.

Table 4-228. Tuchuck-Whale recommended wilderness area

Factors	Description
1. Acres	90,638 acres
2. Summarized description of the recommended boundary	<p>This area is bisected by two roads that are not included in the recommended wilderness area. Frozen Lake Road 114A in the northern area is 3 miles of open yearlong road and then the road is barriered and closed to motorized use for 6 miles. In the wintertime, this road is a designated motorized over-snow vehicle corridor (100 feet either side of the route). This road is excluded from the recommended wilderness area. The southern road is Graves Creek/Trail Creek NFS Road 114, which is open yearlong, but in winter snowmobiles can only go to Tuchuck Campground. This road is excluded from the recommended wilderness area.</p> <p>This area generally follows the boundaries of three inventoried roadless areas: Tuchuck, Mount Hefty, and Thompson-Seton. The northern boundary follows the Canadian border until 2 miles from Frozen Lake, where it then follows previously harvested areas to the Whitefish Divide. The northern boundary excludes the clearing along the international boundary line where the vegetation is routinely removed. The western boundary is the divide between the Kootenai and Flathead National Forests (Whitefish Divide), and it follows the divide down to Link Mountain. The southern boundary has no discernible features, and it runs north of Red Meadow Road and harvest units. The eastern boundary meanders in and out of drainages to follow past harvest areas and roads. Portions of the northeastern boundary follow private property.</p>
3. Brief description of the general geography, topography, and vegetation	<p>The topography consists of steep alpine glaciated canyons and gently rolling ground moraines, with glacial cirque headwalls, glacial trough walls, high-elevation slab rock, and glacial tills. Nasukoin Mountain at 8,086 feet is the highest point in the area. The major drainages are Trail Creek, Whale Creek, and Red Meadow.</p> <p>The predominant tree species are lodgepole pine and western larch, with a mixture of alpine fir, Douglas-fir, and spruce. Whitebark pine dominates in the upper elevations. Alpine larch, a rare high-elevation species, is also present.</p>
4. Current uses and management	<p>The 1986 forest plan primary direction is timber and non-Forest lands capable of providing grizzly bear habitat located in the Trail Creek area. About 91 of the area is within the following inventoried roadless areas: Mount Hefty (11 percent), Thompson-Seton (59 percent), and Tuchuck (22 percent). The primary winter and summer recreation opportunity spectrum class is semiprimitive nonmotorized.</p>

Factors	Description
	<ul style="list-style-type: none"> ○ The area has 7 miles of roads that are closed yearlong and 16 miles of historical roads. There are 98 miles of nonmotorized trails that allow mechanized transport. Motorized over-snow motorized vehicle use is suitable on 1,906 acres December 1 through March 31. ○ The area contains Thoma Lookout, which is active during the fire season, and the Mount Hefty electronic site.
<p>5. Description of the wilderness characteristics and the Forest's ability to protect and manage the area so as to preserve its wilderness characteristics</p>	<p>Natural quality—The majority of this area is very natural appearing, and the current vegetation is primarily affected by natural ecological processes. Most of this area has intact ecological integrity and generally appears to reflect ecological conditions that would be associated with the area without human intervention.</p> <p>Undeveloped quality—The majority of this area is undeveloped, with 7 miles of existing roads that are closed yearlong, 98 miles of nonmotorized trails that allow mechanized transport, and 16 miles of historical roads. There is one active fire lookout, Thoma Lookout, and one electronic site on Mount Hefty.</p> <p>Unconfined and/or primitive recreation—Outstanding opportunities exist for primitive recreation for hiking, backpacking, horseback riding, hunting, forest product gathering, wildlife watching, cross-country skiing, snowshoeing, and backcountry skiing.</p> <p>Solitude—Outstanding opportunities for solitude exist because the area is adjacent to the relatively undeveloped Canadian portion of North fork of the Flathead River to the north, National Forest System lands to the west and south, and private lands to the east. Ninety-three percent of the area is an inventoried roadless area.</p> <p>Other features of value—Healthy whitebark pine that has apparent natural resistance to blister rust occurs within this area, with the potential to provide seed for whitebark pine restoration programs.</p> <p>The Forest's ability to protect and manage these wilderness characteristics is high. About 91 percent of this area is within the three inventoried roadless areas. The current boundaries may pose a challenge to managers because there is one motorized corridor that extends through and adjacent to the area (Grave/Trail Creek Road) plus the Frozen Lake Road that extends partly through the northern area and forms an excluded corridor boundary. In addition, the boundaries are not always based on natural features that are locatable on the map or on the ground.</p>
<p>6. Brief summary of the factors considered and the process used in evaluating the area and developing the alternative(s)</p>	<ul style="list-style-type: none"> ○ There is high public interest in recommending this area for wilderness. ○ There is public interest in recommended wilderness areas within inventoried roadless areas. ○ This area was part of the Whitefish Range Partnership agreement and was carried forward as recommended wilderness. ○ Bull trout and westslope cutthroat trout are present in Trail and Whale Creeks. ○ Tuchuck Research Natural Area (2,050 acres) is within this recommended wilderness area. ○ This area contains a stream that has a consistently high production of harlequin duck broods. ○ This area is important for providing connectivity with Canada for grizzly bear and wolverine. Several putative travel corridors for lynx traverse it and are important for connectivity between the United States and Canada and between Glacier National Park and the Whitefish Range. ○ The area has high and very high quality grizzly bear habitat, maternal denning habitat for wolverine, and, in a majority of the area, high and very high quality lynx habitat. ○ There are three eligible wild and scenic rivers: Trail, Nokio, and Whale Creeks. ○ A portion of the Pacific Northwest scenic trail (7 miles) is within this area.

Factors	Description
	<ul style="list-style-type: none"> ○ This area represents an opportunity to add 9,766 acres of underrepresented ecological groups to the National Wilderness Preservation System. There is a substantial amount of apparent blister rust-resistant whitebark pine in the upper elevations. Alpine larch, a rare high-elevation species, is also present.
<p>7. Brief summary of the ecological and social characteristics that would provide the basis for suitability for inclusion in the National Wilderness Preservation System</p>	<p>The <i>ecological characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ the naturalness of the area because much of the area is affected primarily by natural forces, has mostly intact ecological integrity, and contains many indigenous species such as the grizzly bear, lynx, wolverine, mountain goats, bull trout, and western cutthroat trout; ○ the undeveloped quality of the area, which is high because this area is unroaded; and ○ the unique ecological feature of the phenotypically superior whitebark pine trees identified in this area that may provide seed for whitebark pine tree restoration programs. <p>The <i>social characteristics</i> that provide the basis for suitability are as follows:</p> <ul style="list-style-type: none"> ○ outstanding opportunities for solitude and ○ primitive and/or unconfined recreation opportunities for hiking, backpacking, horseback riding, hunting, fishing, gathering forest products, cross-country and backcountry skiing, and snowshoeing.

Alternative D

No areas were recommended as wilderness in this alternative in order to respond to issues identified in the scoping of the proposed action. Scoping comments identified a desire to not recommend any additional acres to be managed as recommended wilderness. The commenters suggested that existing wilderness areas on the Flathead National Forest (1.2 million out of the 2.4 million total acres available) provide sufficient opportunities and benefits and that additional recommended wilderness designation would promote a higher level of multiple-use conflicts on non-wilderness lands. Although the wilderness inventory displays many areas and acres that possess wilderness character, this alternative is designed to respond to some of the public input received in scoping and to display a reasonable range of alternatives as required under the National Environmental Policy Act. See also the recommended wilderness analysis in the final EIS, section 3.15.

Summary of Management Direction for the Wilderness Inventory Areas by Alternatives

For each wilderness inventory area or portion of a wilderness inventory area that was evaluated but was not included in one of the action alternatives (B modified, C, and D) in the applicable National Environmental Policy Act analysis, the following tables show the allocation of the management areas and document the rationale for excluding it from further analysis. The management areas listed are from the revised forest plan; see table 229.

Table 229. Management areas in the revised forest plan.

Management areas
1a Designated wilderness
1b Recommended wilderness
2a Designated wild and scenic rivers
2b Eligible wild and scenic rivers
3a Administrative areas
3b Special areas
4a Research natural areas
4b Experimental and demonstration forests
5a Backcountry nonmotorized year-round
5b Backcountry motorized year-round, wheeled vehicle use only on designated roads, trails, and areas
5c Backcountry: motorized over-snow vehicle opportunities (on designated routes and areas)
5d Backcountry: wheeled vehicle use on designated roads, trails, and areas April 1 to Nov. 30
6a General forest low-intensity vegetation management
6b General forest medium-intensity vegetation management
6c General forest high-intensity vegetation management
7 Focused recreation areas

The tables that follow (table 4-230 through table 4-253) list management area allocations using dual management area allocations. Management area designations sometimes overlap; for example, there may be an eligible wild and scenic river (management area 2b) or a research natural area (management area 4a) within management area 1b (recommended wilderness).

To fully illustrate the allocation of management areas in the wilderness inventory areas, when all or a portion of a wilderness inventory area was allocated to 1b, the second column reflects the total percentage that is recommended for wilderness. Other management area allocations for that wilderness inventory area, including dual allocations (if existing), are listed.

Note: The columns “1b Allocation” and “Other Management Area Allocation” may total more or less than 100 percent due to possible overlap of management area allocations as well as the use of rounding when determining percentages.

Beaver Lake Wilderness Inventory Area—3,478 acres

Table 4-230. Management area allocation by alternative for the Beaver Lake wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0	5c (15%), 6a (68%) 6b (17%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	0	5c (100%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness. There is no inventoried roadless area within this wilderness inventory area.
D	0	6a (15%) 6b (85%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Bob North Wilderness Inventory Area—88,034 acres

Table 4-231. Management area allocation by alternative for the Bob North wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	38%	2a (2%), 2b (5%), 5a (35%), 5c (14%), 6a (3%), 6b (4%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	87%	2a (2%), 2b (5%), 5a (6%) 5c (4%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0	2a (2%), 2b (5%), 5a (67%), 5c (17%), 6a (5%), 6b (4%), 6c (< 1%)	Responds to comments stating that existing wilderness on the Forest is sufficient.

Canyon Wilderness Inventory Area—18,821 acres

Table 4-232. Management area allocation by alternative for the Canyon wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	5a (47%), 5c (12%), 6a (12%), 6b (3%), 7 (26%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
C	42%	5a (24%), 5c (10%), 6a (16%), 6b (4%), 7 (5%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0	5a (43%), 5c (15%), 6a (12%), 6b (3%), 7 (26%)	Responds to comments stating that existing wilderness on the Forest is sufficient.

Coal Wilderness Inventory Area—67,479 acres

Table 4-233. Management area allocation by alternative for the Coal wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	5a (66%), 5c (8%), 6a (10%), 6b (16%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	67%	5a (27%), 5c (5%), 6a (1%), 6b (1%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0	5a (64%), 5c (8%), 6a (13%), 6b (15%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Cold Creek Wilderness Inventory Area—674 acres

Table 4-234. Management area allocation by alternative for the Cold Creek wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	5c (23%), 6b (77%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	23%	5c (77%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	5c (23%), 6b (77%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Crane Porcupine Wilderness Inventory Area—5,369 acres

Table 4-235. Management area allocation by alternative for the Crane Porcupine wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	6a (59%), 6b (39%), 6c (2%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	0%	5c (100%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness. There is no inventoried roadless area within this wilderness inventory area.
D	0%	6b (98%), 6c (2%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Demers Wilderness Inventory Area—6,948 acres

Table 4-33. Management area allocation by alternative for the Demers wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	2a (1%), 5a (18%), 6a (56%), 6b (25%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	0%	2a (1%), 5a (73%), 6b (25%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness. There is no inventoried roadless area within this wilderness inventory area.
D	0%	2a (1%), 6a (65%), 6b (22%), 6c (12%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Elk Creek Wilderness Inventory Area—7,714 acres

Table 4-236. Management area allocation by alternative for the Elk Creek wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	18%	2b (14%), 5a (26%), 6b (43%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	38%	2b (12%), 5c (15%), 6a (39%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	2b (14%), 5a (47%), 6b (39%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Essex Wilderness Inventory Area—22,912 acres

Table 4-237. Management area allocation by alternative for the Essex wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	8%	2a (8%), 5a (19%), 5c (36%), 6a (20%), 6b (4%) 6c (5%), 7 (1%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	76%	2a (8%), 5c (6%), 6a (8%), 7 (1%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	2a (8%), 5a (23%), 5c (32%), 6a (25%), 6b (6%), 6c (5%), 7 (1%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Fatty Creek Wilderness Inventory Area—4,959 acres

Table 4-238. Management area allocation by alternative for the Fatty Creek wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	3b (2%), 5a (3%), 5c (31%), 6b (63%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	26%	3b (2%), 5c (71%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	3b (2%), 5a (3%), 5c (31%), 6b (63%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Glacier Creek Wilderness Inventory Area—2,591 acres

Table 4-239. Management area allocation by alternative for the Glacier Creek wilderness inventory area

Alternative	1b allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	2b (32%), 3b (47%), 6a (1%), 6b (20%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	0%	2b (32%), 3b (47%), 5c (21%),	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness. There is no inventoried roadless area in this wilderness inventory area.

Alternative	1b allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
D	0%	2b (32%), 3b (47%), 6a (1%), 6b (20%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Hungry Horse Reservoir East Wilderness Inventory Area—36,928 acres

Table 4-240. Management area allocation by alternative for the Hungry Horse Reservoir East wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	5a (51%), 5c (24%), 6a (10%), 6b (15%),	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	83%	5a (1%), 5c (13%), 6a (3%),	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	5a (51%), 5c (24%), 6a (6%), 6b (17%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Hungry Horse Reservoir West Wilderness Inventory Area—178,404 acres

Table 4-241. Management area allocation by alternative for the Hungry Horse Reservoir West wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	12%	2b (2%), 5a (11%), 5b (27%), 5c (25%), 5d (5%), 6a (8%), 6b (8%), 6c (2%), 7 (1%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	85%	2b (2%), 5c (8%), 6a (6%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	2b (2%), 3b (8%), 5a (8%), 5b (28%), 5c (29%), 5d (5%), 6a (9%), 6b (7%), 6c (2%), 7 (1%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Jim Creek Wilderness Inventory Area—1,519 acres

Table 4-242. Management area allocation by alternative for the Jim Creek wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	5c (31%), 6b (69%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	3%	5c (96%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	6a (31%), 6b (69%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Le Beau Wilderness Inventory Area—6,340 acres

Table 4-243. Management area allocation by alternative for the Le Beau wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	2b (13%), 4a (52%), 6a (5%), 6c (4%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	92%	2b (10%), 4a (41%), 6c (3%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	2b (17%), 4a (70%), 6a (7%), 6b (1%), 6c (6%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Lindbergh Lake Wilderness Inventory Area—1,013 acres

Table 4-244. Management area allocation by alternative for the Lindbergh Lake wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	2b (4%), 5a (45%), 5c (11%), 6b (40%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	0%	2b (4%), 5a (45%), 5c (51%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness. There is no inventoried roadless area within this wilderness inventory area.
D	0%	2b (4%), 5a (45%), 5c (11%), 6b (40%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Meadow Lake Wilderness Inventory Area—1,037 acres

Table 4-245. Management area allocation by alternative for the Meadow Lake wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	2b (2%), 5a (49%), 5c (17%), 6b (27%), 6c (6%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	0%	2b (2%), 5a (49%), 5c (49%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	2b (2%), 5a (49%), 5c (17%), 6b (27%), 6c (6%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

North Fork Cold Creek Wilderness Inventory Area—443 acres

Table 4-246. Management area allocation by alternative for the North Fork wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	6a (26%), 6b (74%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	26%	5c (59%), 6a (15%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	6a (26%), 6b (74%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Piper Creek Wilderness Inventory Area—642 acres

Table 4-247. Management area allocation by alternative for the Piper Creek wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	5a (20%), 5c (80%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	100%		This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	5a (20%), 5c (80%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Puzzle Wilderness Inventory Area—24,133 acres

Table 4-248. Management area allocation by alternative for the Puzzle wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	51%	5a (7%), 5c (26%), 6a (9%), 6b (7%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	86%	5c (14%), 6a (1%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	5a (58%), 5c (22%), 6a (13%), 6b (7%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Sky West Wilderness Inventory Area—6,265 acres

Table 4-249. Management area allocation by alternative for the Sky West wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	5a (12%), 5c (49%), 6a (32%), 6b (6%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	83%	5c (13%), 6a (4%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	5a (14%), 5c (32%), 6a (47%), 6b (7%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Swan Face South Wilderness Inventory Area—52,978 acres

Table 4-250. Management area allocation by alternative for the Swan Face South wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	80%	2b (5%), 5a (4%), 5c (4%), 6a (4%), 6b (2%), 6c (5%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	91%	2b (5%), 5c (8%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
D	0%	2b (5%), 5a (80%), 5c (5%), 6a (1%), 6b (2%), 6c (5%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Tuchuck Wilderness Inventory Area—32,667 acres

Table 4-251. Management area allocation by alternative for the Tuchuck wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	83%	2b (2%), 4a (5%), 5c (1%), 6a (14%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	98%	2b (2%), 4a (6%), 5c (1%), 6a (1%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0	2b (2%), 4a (6%), 5a (76%), 5c (1%), 6a (15%),	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Whale Wilderness Inventory Area—69,549 acres

Table 4-252. Management area allocation by alternative for the Whale wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	77%	2b (7%), 5a (4%), 5c (4%), 6a (11%), 6b (3%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	84%	2b (7%), 5a (9%), 5c (3%), 6a (1%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	2b (7%), 5a (69%), 5c (9%), 6a (12%), 6b (3%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Woodward Creek Wilderness Inventory Area—2,158 acres

Table 4-253. Management area allocation by alternative for the Woodward Creek wilderness inventory area

Alternative	1b Allocation (Recommended Wilderness)	Other Management Area Allocation	Rationale
B modified	0%	5c (42%), 6b (58%)	This alternative considered the wilderness evaluation information which indicated these areas had wilderness characteristics and balanced this with other multiple uses to minimize existing conflicting uses when carrying forward recommended wilderness areas.
C	39%	5c (61%)	This alternative responds to comments asking for all inventoried roadless areas to be managed as recommended wilderness.
D	0%	5c (40%), 6a (2%), 6b (58%)	This alternative responds to comments stating that existing wilderness on the Forest is sufficient.

Step 4. Recommendation

The draft record of decision identifies the following eight areas as the preliminary administrative recommendation (recommended wilderness) in alternative B modified. See figure 1-65 for a map of these recommended wilderness areas. The decision maker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas recommended in this decision are an appropriate distribution for the Forest in consideration of the wilderness evaluation for each area, alternative analyses, and public comments. The draft record of decision tiers to step 3 in this appendix for the summary of factors 1 through 7.

Table 254. Recommended wilderness areas in alternative B modified (preferred alternative)

Name	Acreage
Bunker-Alcove	18,901
Elk Creek	1,442
Java-Bear Creek	1,824
Jewel Basin	18,462
Limestone-Dean	15,026
Slippery Bill-Puzzle	12,393
Swan Front	42,534
Tuchuck-Whale	79,821
Total acres	190,403

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Appendix 5: Wild and Scenic River Eligibility Study Process

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Background

The Wild and Scenic Rivers Act

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Wild and Scenic Rivers Act protects the special character of these rivers while also recognizing the potential for their appropriate use and development.

Selected rivers in the United States are preserved for possessing outstandingly remarkable values, which include scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Designated rivers or river segments are preserved in their free-flowing condition and are not dammed or otherwise impeded. Designation as a wild and scenic river does not confer the same level of protection as a wilderness area designation. However, wild and scenic designation protects the free-flowing nature of rivers in non-Federal areas, something the Wilderness Act and other Federal designations cannot do.

The process of determining whether a river should be recommended for inclusion in the National Wild and Scenic River System has three steps: an eligibility determination with assigned preliminary classification, a suitability determination, and recommendation to Congress. Any river deemed eligible may be studied for its suitability for inclusion in the National Wild and Scenic River System at any time. Rivers may be studied for suitability as a part of a land management plan development, revision, or amendment; in conjunction with a project decision; or in a separate study. A suitability study is done after an eligibility study is completed. A suitability study provides the basis for determining which eligible rivers or river segments should be recommended to Congress as potential additions to the National Wild and Scenic River System. Suitability studies are analyzed and completed in an environmental impact statement; they may or may not be completed with the revision of a land management plan.¹

When the Forest Service determines a river is eligible for inclusion in the National Wild and Scenic River System, it must ensure the river has interim protection measures (Forest Service Handbook 1909.12 chap. 80). These protection measures apply until a decision is made on the future use of the river and adjacent lands through an act of Congress or until a determination is made that the river is not suitable.

Eligible wild and scenic rivers (or river segments) are assigned one or more preliminary classifications: wild, scenic, or recreational (see table 5-1). These classifications are based on the developmental character of the river on the date of designation and dictate the level of interim protection measures to apply. Wild rivers are the most remote and undeveloped, whereas recreational rivers often have many access points and nearby roads, railroads, and bridges and may have undergone some impoundment or diversion in the past. Scenic rivers are largely primitive and undeveloped and have no substantial evidence of human activity, although evidence of past or ongoing timber harvest may be noticeable. Roads may occasionally reach or bridge the river. See table 5-1 for a description of attributes that determine a river's preliminary classification. A river's classification is not necessarily related to the value that made it worthy of designation. That is, for a river to have a scenic classification, scenery does not have to be an outstandingly remarkable value.

¹ For this Flathead National Forest plan revision, a suitability study is not being completed.

Table 5-1. Classification for wild, scenic, and recreational rivers

Attribute	Wild	Scenic	Recreational
Water Resources Development	Free of impoundment	Free of impoundment	Some existing impoundment or diversion. The existence of low dams, diversions, or other modifications of the waterway is acceptable, provided the waterway remains generally natural and riverine in appearance.
Shoreline development	Essentially primitive. Little or no evidence of human activity. The presence of a few inconspicuous structures, particularly those of cultural value, is acceptable. A limited amount domestic livestock grazing or hay production is acceptable. Little or no evidence of past timber harvest. No on-going timber harvest.	Largely primitive and undeveloped. No substantial evidence of human activity. The presence of small communities or dispersed dwellings or farm structure is acceptable. The presence of grazing, hay production, or row crops is acceptable. Evidence of past or on-going timber harvest is acceptable, provided the forest appears natural from the riverbank	Some development. Substantial evidence of human activity. The presence of extensive residential development and a few commercial structures is acceptable. Lands may have been developed for the full range of agriculture and forestry uses. May show evidence of past and ongoing timber harvest.
Accessibility	Generally inaccessible except by trail. No roads, railroads or other provision for vehicular travel within the river area. A few existing roads leading to the boundary of the area are acceptable.	Accessible in places by roads. Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches if inconspicuous roads or railroad is acceptable.	Readily accessible by road or railroad. May show evidence of parallel roads or railroads on one or both banks as well as bridge crossings and other river access points is acceptable.
Water Quality	Meets or exceed criteria, or federally approved state standards for aesthetics, for propagation of fish and wildlife normally adaptable to the habitat of the river and for primary contact recreation (swimming) except where exceeded by natural conditions.	No criteria are prescribed by the Wild and Scenic Rivers Act. The Federal Water Pollution Control Act Amendments of 1972 have made it a national goal that all waters of the United States are made fishable and swimmable. Therefore, rivers will not be precluded from scenic or recreational classification because of poor water quality at the time of their study, provided a water quality improvement plan exists, or is being developed in compliance with applicable federal and state laws.	

Overview of the Flathead National Forest's Eligibility Study Process

The 2004 study

In 2004, the Forest conducted a systematic wild and scenic river eligibility inventory as part of preparing the 2006 proposed land management plan. Much of the guidance used to determine the eligibility of wild and scenic rivers was taken from a 1999 technical report by the Interagency Wild and Scenic River Coordinating Council entitled "The Wild and Scenic River Study Process" (Diedrich & Thomas, 1999).

During that inventory, the Flathead National Forest boundary was used as the region of comparison (the geographic area of consideration for each outstandingly remarkable value that serves as the basis for meaningful comparative analysis). Botany and special interest/natural areas were also included as outstandingly remarkable values, although these were not required to be evaluated. The 2004 study determined that 10 streams on the Forest were eligible for inclusion in the National Wild and Scenic Rivers System. However, because of litigation on the 2005 planning rule, the 2006 proposed plan was invalidated.

The 2014 study

In 2012, the Forest Service issued a new planning rule, and the Flathead National Forest restarted the land management plan revision process. The 2012 planning rule requires that, when revising or developing a land management plan, planning teams must complete a wild and scenic river eligibility study.

Identify the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System, unless a systematic inventory has been previously completed and documented, and there are no changed circumstances that warrant additional review. (36 CFR § 219.7(c)(2)(vi))

Montanans for Healthy Rivers felt that the region of comparison used in 2004 was too small in scope and therefore requested a larger region of comparison be used when evaluating outstandingly remarkable values. After careful study, it was determined there were two distinct regions of comparison: one covering western Montana (from the Continental Divide west to the Idaho-Montana border) and the other covering the Northern Rocky Mountain province, based on Bailey's ecoregions (Bailey, 1995). In 2012, Montanans for Healthy Rivers completed a statewide review to identify eligible rivers in Montana, which included 46 rivers they submitted as eligible on the Flathead National Forest. Their statewide review was determined to be a changed circumstance, which the 2012 planning rule lists as a condition for re-evaluating eligibility.

Of the 46 streams Montanans for Healthy Rivers submitted as being eligible on the Flathead National Forest, 10 had already been determined eligible in the 2004 eligibility study process (see page 12 for information on the 2004 eligibility process). Therefore, for this plan revision effort, using the process described on page 4, the 36 remaining streams submitted by Montanans for Healthy Rivers were reviewed and assessed for eligibility.

While conducting the 2014 eligibility study, directives in the Forest Service Manual and Handbooks were being developed as guidance on implementing the 2012 planning rule. In February of 2013, proposed directives were released for public comment. The Flathead National Forest staff used these 2013 proposed directives and also continued to use guidance from the 1999 Wild and Scenic River Study Process document (Diedrich & Thomas, 1999).

On January 30, 2015, the final directives for land management planning were released. The directives provide exceptions for processes started before the directives were finalized:

If a plan amendment or a revision has been initiated prior to issuance of the amended directive, the Responsible Official should use the amended directive in any new step or phase of the planning process, but is not required to revise past steps or phases within the process. (Forest Service Manual 1920.3)

Although some wording in the 2015 directives differs slightly from the direction that was used based on the 1999 study process document and 2013 proposed directives, the overall direction has remained the same.

Interim protection measures

The 2012 planning rule requires interim management of Forest Service-identified eligible rivers or segments, to protect their values prior to a congressional decision on whether to designate them as part of the National Wild and Scenic River System:

(b) The plan must provide plan components, including standards and guidelines, to provide for:

(v) Protection of designated wild and scenic rivers as well as management of rivers found eligible or determined suitable for the National Wild and Scenic River system to protect the values that provide the basis for their suitability for inclusion in the system. (36 CFR 219.10)

Interim protection measures are found in Forest Service Handbook 1909.12, chapter 80, section 84.3 (“Interim Protection Measures for Eligible or Suitable Rivers”). Responsible officials must apply these measures to protect river values on National Forest System lands when planning and implementing projects and activities or where the Forest Service holds an interest on non-Federal lands, such as scenic or access easements.

The proposed land management plan includes interim protection measures under management area 2b, which is “eligible rivers.”

The 2014 Eligibility Process

Criteria for Eligibility

To be eligible for inclusion, a river segment must be free-flowing and, in combination with its adjacent land area, possess one or more outstandingly remarkable values. Free flowing means the river segment must be flowing in a natural condition without impoundment, diversion, straightening, rip rapping, or other modification of the waterway (proposed 2013 Forest Service Handbook 1909.12 chap. 80 secs. 82.12 and 82.14).

Outstandingly Remarkable Values

Changes from the proposed action

Scoping comments indicated that the way we ranked rivers in 2014 was not clear. In particular, rivers that were ranked a 3 were confusing because the matrix included significance at the regional level. Some people felt that any river that ranked a 3 should be an eligible wild and scenic river based on the

description of a 3 as regionally significant. In the 2014 study process, the interdisciplinary team intended the ranking description of “regionally significant” to equate to the comparable ranking criteria utilized in the 2004 study process, which was as follows: “One of only a few this significant in region.” Due to the confusion, we removed the regionally significant ranking from the table.

To be identified as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant when compared with similar values from other rivers at a regional or national scale. Outstandingly remarkable values include scenic, recreation, geologic, fish and wildlife, historic, cultural, or other similar values. River values should meet at least one of the following criteria:

1. Be located in the river or on its immediate shorelands (within 0.25 mile on either side of the river).
2. Contribute substantially to the functioning of the river ecosystem, and/or
3. Owe their location or existence to the presence of the river.

Note that in the 2004 process, botany and research natural areas/special interest areas were reviewed for their outstandingly remarkable values. This was not required, and after reviewing the 2004 process, it was decided not to add these values to the 2014 eligibility process.²

To determine eligibility, each resource specialist used specific criteria and measures to evaluate each river (stream³) or segment for outstandingly remarkable values. Based on this evaluation, documentation was completed for each stream on why it was or was not eligible. Table 5-2 displays how values were ranked. Each stream was ranked based on the following qualitative scoring scale (table 5-2) comparing it to other streams in the region of comparison. A ranking of 4 translated to an outstandingly remarkable value, which then made that stream (or stream segment) eligible.

After considering comments on the proposed action, upper Swan River, from its headwaters at Crystal Lake to its confluence with Lindbergh Lake, was determined to be eligible for the outstandingly remarkable value of recreation, with a wild classification.

Table 5-2. Quantitative ranking of values

Score	Value in Region
0	Nonexistent
1	Less than most
2	Typical
3	One of a few this significant in region ⁴
4	Most significant in region

² For botany, there was only one river that had an outstandingly remarkable value related to a sensitive plant species. For research natural/special interest areas, no eligible river had such an area associated with it, and the determination was made that the presence of a research natural area/special interest area should not result in a determination of eligibility since these are already protected areas.

³ Although the guidance speaks to “rivers,” all of the waterways considered on the Forest consist of creeks and streams.

⁴ Although rivers scored a 3 may be regionally important, they do not possess a river-related value that is a unique, rare, or exemplary feature that is significant when compared with similar values from other rivers at a regional or national scale.

Changes from the draft forest plan

In response to comments requesting that additional rivers be included as eligible, a review of those rivers identified in comments was done in 2017. The results of the review are summarized here, but the full review is documented in appendix A of this document.

For the review, the results in the documentation sheets for each river, by resource area (wildlife, fish, geology, scenery, recreation, prehistory/history) were compared to the results in summary table 5-3. Four typographic errors were found in table 5-3 when compared to the supporting data on the documentation sheets. None of the errors resulted in a change of eligibility. These errors were found and have been corrected in table 5-3:

- Gorge Creek was incorrectly marked a 3 for fish in table 5-3; the documentation sheet ranked it a 2.
- Twin Creek (also known as Upper Twin Creek) was incorrectly marked a 2 for scenery in table 5-3; the documentation sheet ranked it a 3.

Lower Twin Creek was incorrectly marked a 3 for scenery in table 5-3; the documentation sheet ranked it a 2.

- Lower Twin Creek was incorrectly marked a 3 for wildlife in table 5-3; the documentation sheet ranked it a 2.

Public comments requested the following rivers to be eligible (ranked a 4): Basin, Bunker, Dolly Varden, Gordon, Gorge, Granite, Lake, Morrison, Twin, Lower Twin, and Quintonkon Creeks. Twin Creek became a new eligible river based on its new ranking for outstandingly remarkable values for scenery and geology. Although not requested by the public to be eligible, during the review the fisheries biologist realized the outstandingly remarkable for fish for Whale Creek had been incorrectly determined to be a 2 and should have been ranked a 4 for fish; this adds another outstandingly remarkable value to this eligible river (it was already eligible for wildlife).

Documentation of the process

This process paper describes the process used to evaluate the potential eligibility of rivers on the Flathead National Forest to the Wild and Scenic River System, including the criteria used and measured, the region of comparison, and a summary of the outstandingly remarkable value rankings by resource area. Table 5-3 displays the overall ranking of each outstandingly remarkable value for each river evaluated in the 2014 process.

Table 5-4 displays the rivers determined to be eligible for wild and scenic river status on the Flathead National Forest during the 2014 process. Each resource evaluated has separate documentation that includes information such as data sources, rationale for each ranking, and a determination of outstandingly remarkable values. This information can be found in the planning record (USDA, 2004/2014).

Criteria and Measures of Outstandingly Remarkable Values

Recreation

Criteria

Recreation opportunities are, or have the potential to be, popular enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region. River-related opportunities include, but are not limited to, sightseeing, interpretation, wildlife observation, camping, photography, hiking, fishing, hunting, and boating. Rivers may provide settings for national or regional usage or competitive events.

Measures

1. Use level relative to the region of comparison: *high, medium, low*
2. Visitation: *global, national, regional, or local*
3. Unique river recreation: *describe (e.g., blue ribbon designation, renowned rapids)*
4. National or regional competitive events or use: *yes or no*
5. River-related recreation opportunities: *describe*

Region of comparison

Western Montana (from the Continental Divide west to the Idaho–Montana border).

Table 5-3. Ranking of outstandingly remarkable values for rivers evaluated in the 2014 eligibility study process

Stream Name (Ranger District1)	Wildlife	Fish	Recreation	Prehistory/ History	Scenery	Geology
Basin (SBRD)	2	3	2	1	3	2
Bunker (SBRD)	3	2	2	1	2	2
Clack (SBRD)	2	3	1	1	4 eligible	4 eligible
Dean (SBRD)	2	2	1	1	3	2
Dolly Varden (SBRD)	2	3	2	3	2	2
Gordon (SBRD)	2	3	2	3	2	2
Gorge (SBRD)	3	2	2	1	3	3
Lake (SBRD)	3	3	1	1	3	2
Unnamed Fork of Lake (SBRD)	3	3	2	1	3	3
Morrison (SBRD)	3	2	2	3	2	2
Schafer (SBRD)	2	3	2	4 eligible	3	2
Strawberry (SBRD)	2	4 eligible	2	1	2	2
Sullivan (SBRD)	3	2	2	1	2	2
Lower Twin (SBRD)	2	2	2	1	2	2
Twin (SBRD) (also known as Upper Twin)	3	2	2	1	4 eligible	4 eligible
Quintonkon (SBRD)	3	2	1	3	2	2
Youngs (SBRD)	3	4 eligible	4 eligible	4 eligible	4 eligible	3
Granite (HHRD)	3	3	2	3	2	2

Stream Name (Ranger District1)	Wildlife	Fish	Recreation	Prehistory/ History	Scenery	Geology
Graves (HHRD)	2	2	3	4 eligible	3	3
Big (GVRD)	3	2	2	3	2	2
Coal (GVRD)	3	2	1	1	2	2
SF Coal (GVRD)	3	2	1	1	2	2
Cyclone (GVRD)	3	2	1	1	2	2
Hallowat (GVRD)	3	2	1	1	2	2
Langford (GVRD)	2	2	1	1	1	1
Mathias (GVRD)	3	2	1	1	2	2
Moose (GVRD)	3	2	2	1	2	2
Red Meadow (GVRD)	3	2	2	3	2	2
Shorty (GVRD)	3	2	1	1	2	2
Whale (GVRD)	4 eligible	4 eligible	2	1	2	2
Elk (SLRD)	3	4 eligible	2	1	2	2
Glacier (SLRD)	4 eligible	2	2	1	4 eligible	4 eligible
Goat (SLRD)	3	2	2	1	2	2
Lion (SLRD)	4 eligible	2	2	1	3	3
NF Lost (SLRD)	3	2	2	1	2	2
SF Lost (SLRD)	3	2	2	1	2	2
Upper Swan (SLRD)	3	2	4 eligible	1	2	2
Lower Swan (SLRD)	4 eligible	2	3	1	2	2
Squeezer (SLRD)	2	2	1	1	2	2

1. SBRD = Spotted Bear Ranger District; HHRD = Hungry Horse Ranger District; GVRD = Glacier View Ranger District; SLRD = Swan Lake Ranger District; NF = North Fork; SF = South Fork. Refer to table 5-2 for ranking definitions.

Table 5-4. Rivers determined to be eligible for wild and scenic river status on the Flathead National Forest during the 2014 eligibility study process

Name	Length	Outstandingly Remarkable Value(s)	Preliminary Classification
Clack	8 miles	Scenery, geology	Wild
Elk	10 miles	Fish	Scenic
Glacier	6 miles	Wildlife, scenery, geology	Wild and scenic
Graves	10 miles	Prehistory	Wild and scenic
Lion	11 miles	Wildlife	Scenic
Schafer	11 miles	Prehistory	Wild
Strawberry	14 miles	Fish	Wild
Swan, lower	11 miles	Wildlife	Recreational
Swan, upper	2 miles	Recreation	Wild
Twin (also known as Upper Twin)	6 miles	Scenery, Geology	Wild and scenic
Whale	21 miles	Wildlife, Fish	Scenic and recreational
Youngs	23 miles	Fish, recreation, prehistory, scenery	Wild

Wildlife

Criteria

Wildlife values may be judged on the relative merits of either terrestrial or aquatic wildlife populations or habitat or on a combination of these conditions.

Populations

The river, or area within the river corridor, contains nationally or regionally important populations of indigenous wildlife species. Of particular significance are species considered to be unique and/or populations of Federal- or State-listed or candidate threatened, endangered, or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.

Habitat

The river, or area within the river corridor, provides exceptionally high-quality habitat for wildlife of national or regional significance and/or may provide unique habitat or a critical link in habitat conditions for Federal- or State-listed or candidate threatened, endangered, or sensitive species. Contiguous habitat conditions are such that the biological needs of the species are met. Diversity of habitat is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.

Measures

Population criterion measures

1. Nationally or regionally important species
2. Threatened or endangered species
3. Species of conservation concern
4. Terrestrial species richness⁵
5. Species in decline in region of comparison
6. Sensitive species
7. Diversity of species
8. Unique species
9. Species of public interest

Habitat criterion measures

1. Security, based on road and trail densities
2. Unique habitat features such as fens or wetlands
3. Connectivity and crucial habitat

Region of comparison

Northern Rocky Mountain Province from Bailey's ecoregions (Bailey, 1995).

⁵ As defined by Montana Fish, Wildlife and Parks Crucial Areas Planning System (CAPS).

Fish

Criteria

Fish values may be judged on the relative merits of fish populations or habitat or on a combination of these conditions.

Populations

The river is nationally or regionally an important producer of resident and/or anadromous fish species. Diversity of fish species or the presence of wild stock and/or Federal- or State-listed or candidate threatened, endangered, or species of conservation concern are of particular significance.

Habitat

The river provides uniquely diverse or high-quality habitat for fish species indigenous to the region of comparison. Exemplary habitat for wild stocks and/or Federal- or State-listed or candidate threatened, endangered, or species of conservation concern is of particular significance.

Measures

Population criterion measures

1. Presence of bull trout, which is federally listed as threatened
2. Presence of westslope cutthroat trout

Habitat criterion measures

1. Unique habitat
2. Connectivity and/or crucial habitat

Region of comparison

Northern Rocky Mountain province from Bailey's ecoregions (Bailey, 1995).

Geology

Criterion

The river, or the area within the river corridor, contains one or more examples of a geologic feature, process, or phenomenon that is unique or rare within the region of comparison. The feature(s) may be in an unusually active stage of development, represent a "textbook" example, and/or represent a unique or rare combination of geologic features (erosional, volcanic, glacial, or other geologic structures).

Measures

1. The river or river corridor contains an example of a geologic feature, process, or phenomenon that is rare, unique, or unusual.
2. Geological features are in an unusually active stage of development or represent a textbook example.
3. Geologic features represent a unique or rare combination of geologic features (erosional, volcanic, glacial, or other geologic structures).

Region of comparison

Western Montana (from the Continental Divide west to the Idaho–Montana border).

Prehistory and history

Criteria

The river, or area within the river corridor, contains important evidence of occupation or use by humans. Sites may have national or regional importance for interpreting history or prehistory.

Prehistory

Sites may have unique or rare characteristics or exceptional human interest value; represent an area where a culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; or may have been used by cultural groups for rare sacred purposes

History

Sites or features associated with a significant event, an important person, or a cultural activity of the past that was rare or one-of-a-kind in the region. A historic site or feature, in most cases, is 50 years old or older.

Measures

1. There are sites or features associated with a significant event, an important person, or a cultural activity of the past that was rare or one-of-a-kind in the region.
2. There are sites that may have unique or rare characteristics or exceptional human interest value.
3. There are sites or features that represent an area where a culture or cultural period was first identified and described.
4. There are sites or features that may have been used concurrently by two or more cultural groups.
5. There are sites or features that may have been used by cultural groups for rare sacred purposes.

Region of comparison

Western Montana (from the Continental Divide west to the Idaho–Montana border).

Scenery

Criteria

The landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features and/or attractions. When analyzing scenic values, additional factors such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment.

Measures

1. There is very high scenic class within the 0.5-mile river corridor:
 - i. There are significant seasonal variations in vegetation.
 - ii. There is a combination of diverse landscape features such as landform, vegetation, water, and color that makes notable or exemplary visual features and/or attractions.
2. There is very high scenic integrity within the 0.5-mile river corridor.
 - i. Consider the length of time negative intrusions are viewed.

- iii. Consider the scale of cultural modifications.
- 3. There are views of outstanding geological features such as rock outcroppings that show a unique or rare combination of scenic features (erosional, volcanic, glacial, or other geologic structures).

Region of comparison

Western Montana (from the Continental Divide west to the Idaho–Montana border).

The 2004 Eligibility Process

Overview

The primary guidance used for the 2004 process was the 1999 study process guide described on page 3. To identify potential streams for eligibility, all the named streams that show up on a 1:100,000-scale map were reviewed for their outstandingly remarkable values. District and/or supervisor's office specialists determined the ratings for the named streams to determine if there was an outstanding remarkable value. Each stream was rated from 0 to 4 based on whether they had outstanding remarkable values.

Criteria for Eligibility

The criteria used for stream eligibility in the 2004 eligibility study were the same as stated on page 4: the stream or segment must be free flowing and, in combination with its adjacent land area, possess one or more outstandingly remarkable values.

Outstandingly Remarkable Values

To be identified as outstandingly remarkable, a river-related value considered should be rare and exemplary when compared to other rivers in the region of comparison. The region of comparison for the 2004 eligibility process was the Flathead National Forest. The value should

- 1. be located in the river or on its immediate shorelands (within 0.25 mile on either side of the river).
- 2. contribute substantially to the functioning of the river ecosystem, and/or
- 3. owe their location or existence to the presence of the river.

To determine eligibility, each resource specialist used specific criteria to evaluate each stream or segment for outstandingly remarkable values. Each stream was ranked for outstandingly remarkable values based on the following qualitative ranking scale, and then it was compared to other streams in the region of comparison. Table 5-5 displays how values were ranked. A value ranking of 4 translated to an outstandingly remarkable value, which then made that stream (or segment) eligible.

Table 5-5. Ranking of outstandingly remarkable values used to determine eligibility during the 2004 study process

Value	Description
0	Value nonexistent
1	Less significant than most in region
2	Typical, one of many equally significant in region
3	One of only a few this significant in region
4	The most significant in region

Although the criteria were mostly the same with both eligibility processes, the 2004 process did not develop measures to address the criteria as we did in the 2014 eligibility process.

Recreation

Criteria

- Are recreational opportunities unique or rare within the region?
- Are recreational opportunities popular enough or have the potential to be popular enough to attract visitors from throughout the region of comparison?
- Are visitors willing to travel long distances to use the river resources for recreational purposes?
- Are interpretive and/or educational opportunities exceptional and unique within the region of comparison?

Wildlife

Criteria

- Does the river or river corridor contain nationally or regionally important populations of indigenous wildlife species?
- Does the river or river corridor provide exceptionally high-quality habitat for wildlife of national or regional significance?
- Does the river or river corridor provide unique habitat or a critical link in habitat conditions for Federal- or State-listed (or candidate) threatened, endangered, or sensitive species? Of particular significance is the presence of wild stocks and/or Federal- or State-listed (or candidate) threatened, endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of “outstandingly remarkable.”

Fish

Criteria

Populations

- Are threatened, endangered, or sensitive species represented?
- Is it an important stronghold for native fish assemblages (diversity)?
- Are there genetically pure strains of native populations?
- Is there a Native American dependence on this fishery?
- Is there a lack of exotic species or non-native species in this river?
- Are there other important wildlife species dependent upon this fishery?

Habitat

- Is there a relationship between this river and the health and vigor of the fishery that would warrant protection of the river?
- Are there natural barriers to fish migration that restrict the distribution of the population?
- Is there high restoration or recovery potential for the habitat?

- Is this an intact system and does the habitat support native or wild stock assemblages?
- Does the habitat represent a pristine river system?

Geology

Criterion

- Does the river, or area within the river corridor, contain one or more examples of a geologic feature, process, or phenomenon unique or rare within the region of comparison?

Prehistory and history

Criteria

Prehistory

- Does the river or river corridor contain sites where there is evidence of occupation or use by Native Americans?
- Do sites have unique or rare characteristics or exceptional human-interest values?
- Are sites nationally or regionally importance for interpreting prehistory?
- Are sites rare and do they represent an area where a culture or cultural period was first identified and described
- Were sites used concurrently by two or more cultural groups, and/or used by cultural groups for sacred purposes?
- Does the river or area within the river corridor contain a site or feature associated with a significant event, an important person, or a cultural activity of the past that was unique and rare in the region?

History

- Does the river or river corridor contain a site or features associated with a significant event, an important person, or a cultural activity of the past that was rare or one-of-a-kind in the region?

Scenery

Criteria

- Do the landforms, vegetation type or seasonal variations, water color, or related factors result in notable or exemplary visual features or attractions?

Botany

- Are there any occurrences of federally threatened or endangered plant species?
- Are there any occurrences of plant species designated as sensitive by the Forest Service?
- Are there any occurrences of other rare plants that are tracked by the state Natural Heritage Programs?
- Are there any plant communities or habitats that are unique, rare, or significant or that are tracked by the state Natural Heritage Programs?

- Are the native plant communities in good ecological conditions (e.g., relatively free of invasive plant species)?

Natural areas

- Are there any designated research natural areas along the river?
- Are there any special interest areas along the river?
- Are there any other specially designated areas in the corridor?

Results

Out of 467 streams we reviewed on the Flathead National Forest in 2004, the evaluations of 10 streams resulted in a ranking of 4, which indicates an outstandingly remarkable value that makes the stream eligible for wild and scenic river consideration (table 5-6). The complete ranking is found in table 5-7.

Table 5-6. Outstandingly remarkable value rankings for the eligible streams from the 2004 study process

Stream Name	Wildlife	Fish	Recreation	Prehistory/ History	Scenery	Geology	Botany
Aeneas	2	2	1	4/1	2	1	2
Big Salmon	3	4	4	4/3	3	3	0
Danaher	4	4	4	4/4	4	2	4
Gateway	2	3	3	1/4	4	4	3
Le Beau	2	2	3	2/4	4	4	2
Little Salmon	3	4	2	4/1	4	3	0
Logan	3	3	4	1/2	4	3	2
Spotted Bear	4	3	4	3/2	3	3	3
White River	3	4	1	4/4	3	4	3
Yakinikak	2	3	1	4/3	2	0	0
Trail	3	4	2	4/2	2	4	0
Nokio	2	2	1	4/2	2	1	0

Table 5-7. Outstandingly remarkable value rankings of all streams for the 2004 process

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Abbot (HHRD)	1	0	0	0	0	0	0	0	3
Addition (SBRD)	2	1	0	0	0	1	0	3	0
Aeneas (HHRD)	2	2	1	4 Eligible	1	2	1	2	0
Akinkoka (GVRD)	2	1	1	0	0	2	0	0	0
Albino (SBRD)	2	0	1	0	0	2	0	0	0
Alcove (SBRD)	2	0	0	0	0	0	0	0	0
Alder (SLRD)	2	1	0	0	0	1	1	0	0
Alder (TLRD)	2	2	1	1	1	2	2	2	0
Alloy (SBRD)	2	0	2	0	0	2	1	0	0
Anchor (TLRD)	2	2	1	0	1	2	1	2	0
Antley (GVRD)	2	2	2	0	0	2	0	0	0
Argosy (SBRD)	2	1	1	0	0	2	2	0	0
Aurora (HHRD)	2	0	1	0	0	1	0	0	0
Ayres (SBRD)	2	1	1	0	0	1	0	3	0
Babcock (SBRD)	2	2	1	3	0	1	0	0	0
Bales Creek (SLRD)	1	0	0	0	0	1	1	0	0
Ball (SBRD)	2	2	1	0	0	1	0	0	0
Baptiste (SBRD)	2	0	0	0	0	0	0	0	0
Bar (SBRD)	2	0	1	0	0	1	0	0	0
Barber (SLRD)	2	1	1	0	0	1	1	2	0
Bartlett (SBRD)	2	1	2	0	0	2	0	0	0
Basin (SBRD)	2	2	1	0	0	1	1	0	0
Basin (SBRD)	2	3	1	0	0	2	1	0	0
Battery (HHRD)	2	1	0	0	0	0	0	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Bear (HHRD)	2	2	1	3	0	1	0	0	0
Bear (SBRD)	2	0	0	0	0	0	0	0	0
Bear (SLRD)	2	1	1	0	0	1	1	1	0
Bear (TLRD)	2	2	0	0	1	1	2	2	0
Beaver (SLRD)	3	1	2	0	0	2	1	2	2
Ben (HHRD)	2	0	0	0	0	1	0	0	0
Bent (SBRD)	2	1	0	0	0	1	0	0	0
Bergsicker (HHRD)	2	0	1	0	0	1	0	0	0
Bethal (SLRD)	3	2	1	0	0	2	1	0	0
Big (GVRD)	3	3	1	0	0	2	0	3	0
Big Bill (SBRD)	2	1	0	2	0	1	0	0	0
Big Salmon (SBRD)	3	4 Eligible	4 Eligible	4 Eligible	3	3	4 Eligible	0	0
Biglow (HHRD)	2	1	1	0	0	1	0	0	0
Bill (TLRD)	2	2	2	1	2	2	2	2	0
Birch (SLRD)	2	2	1	0	0	1	1	2	0
Black Bear (SBRD)	2	1	1	0	0	1	1	0	0
Bond (SLRD)	2	2	2	3	2	2	2	2	0
Boulder (SBRD)	2	0	0	0	0	0	0	0	0
Bowen (TLRD)	2	2	0	0	0	1	2	2	0
Bowl (SBRD)	2	3	2	0	0	2	1	3	0
Bradley (SBRD)	2	2	1	0	0	1	0	0	0
Branch (SBRD)	2	2	1	0	0	1	0	0	0
Brown (SLRD)	2	0	1	0	0	1	1	0	0
Brownie (SBRD)	2	0	1	0	0	1	0	0	0
Brownstone (SBRD)	2	0	1	0	0	1	0	0	0
Bruce (SBRD)	2	1	2	0	0	2	1	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Brush (SBRD)	2	0	0	0	0	2	0	0	0
Buck (SLRD)	2	2	1	0	0	1	1	2	0
Bug (SLRD)	1	1	1	0	0	1	1	0	0
Bunker (SBRD)	3	2	2	3	0	3	1	0	0
Burnt (SBRD)	2	1	1	0	0	1	0	0	0
Butcher (SBRD)	2	0	1	0	0	1	0	3	0
Cabin (SBRD)	2	1	1	0	0	1	0	0	0
Calbick (SBRD)	2	2	1	0	0	1	0	0	0
Calf (SBRD)	2	0	2	0	0	2	1	0	0
Camp (SBRD)	2	1	2	0	0	2	1	0	0
Cannon (SBRD)	2	1	2	0	0	2	1	0	0
Canyon (GVRD)	2	2	2	0	0	2	0	0	0
Canyon (HHRD)	2	1	1	0	0	1	0	0	0
Capitol (SBRD)	2	0	0	0	0	0	0	0	0
Cardinal (SBRD)	2	1	1	0	0	1	0	0	0
Casey (SBRD)	2	0	0	0	0	0	0	0	0
Cat (SLRD)	3	2	2	0	0	2	2	0	0
Cataract (SBRD)	2	1	1	0	0	1	1	2	0
Catchem (SBRD)	2	0	1	0	0	1	0	0	0
Cayuse (SBRD)	2	0	0	0	0	0	0	0	0
Cedar (SBRD)	2	0	0	0	0	0	0	0	0
Cedar (SLRD)	3	2	1	0	0	2	1	0	0
Challenge (HHRD)	2	2	1	0	2	1	0	0	0
Charlie (HHRD)	2	1	2	0	0	1	0	0	0
Charlotte (SBRD)	2	0	0	0	0	0	0	0	0
Chasm (SBRD)	2	0	1	0	0	1	0	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Christopher (SBRD)	2	0	0	0	0	0	0	0	0
Cilly (SLRD)	2	1	2	0	0	2	1	0	0
Clack (SBRD)	2	3	2	2	0	3	1	0	0
Clark (SBRD)	2	2	0	0	0	0	0	0	0
Clayton (HHRD)	2	2	2	0	0	1	0	0	0
Cliff (SBRD)	2	0	0	0	0	1	1	0	0
Cliff (SLRD)	2	0	2	0	0	2	2	0	0
Clorinda (HHRD)	2	1	0	0	0	1	0	0	0
Cluster (SBRD)	2	0	0	0	0	0	0	3	0
Coal (GVRD)	2	3	2	0	0	2	2	3	0
Cold (SLRD)	3	3	2	0	0	2	2	0	2
Colts (GVRD)	2	1	0	0	0	1	0	0	0
Combat (SBRD)	2	0	0	0	0	0	0	0	0
Condon (SLRD)	3	2	1	0	3	2	1	3	3
Conner (SBRD)	2	2	1	0	0	1	0	0	0
Cooney (SLRD)	2	2	1	0	0	2	1	0	0
Corduroy (TLRD)	2	2	1	0	0	1	2	2	0
Cottonwood (TLRD)	2	2	1	0	1	1	2	2	0
Cox (SBRD)	2	2	2	0	0	2	1	0	0
Crazy Horse (SLRD)	3	0	2	0	0	2	2	0	2
Crescent (HHRD)	2	1	0	0	0	2	0	0	0
Crystal (HHRD)	2	1	0	0	0	2	0	0	0
Cy (HHRD)	2	2	2	0	0	2	0	0	0
Cyclone (GVRD)	2	2	1	0	0	1	0	0	0
Cyclone (TLRD)	2	2	0	0	0	1	2	2	0
Daggett (TLRD)	2	2	0	0	0	1	2	2	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Damnation (SBRD)	2	0	0	0	0	0	0	0	0
Danaher (SBRD)	4 Eligible	4 Eligible	4 Eligible	4 Eligible	4 Eligible	4 Eligible	2	4 Eligible	3
Dart (SBRD)	2	0	0	0	0	0	0	0	0
Dead Horse (GVRD)	2	2	1	0	0	2	1	0	0
Deadfall (SBRD)	2	0	0	0	0	0	0	0	0
Deadhorse (SBRD)	2	0	0	0	0	0	0	0	0
Dean (SBRD)	2	1	2	0	0	2	0	0	0
Deep (GVRD)	2	0	1	0	0	1	0	0	0
Deep (HHRD)	2	2	0	0	0	1	0	0	0
Deer (SBRD)	2	0	0	0	0	0	0	0	0
Deer (SLRD)	2	1	1	0	0	1	1	0	0
Deerlick (HHRD)	2	1	1	0	0	2	0	0	0
Delaware (SBRD)	2	0	0	0	0	0	0	0	0
Devils Corkscrew (HHRD)	2	0	2	0	0	1	0	0	0
Devine (SBRD)	2	0	0	0	0	0	0	0	0
Dickey (HHRD)	2	1	2	0	0	2	0	3	0
Dirtyface (HHRD)	2	1	2	0	0	2	0	0	0
Doctor (SBRD)	2	3	1	0	0	1	0	0	0
Dodge (HHRD)	2	2	2	0	0	2	0	0	0
Dog (SLRD)	3	2	1	0	0	1	1	0	0
Dog (TLRD)	2	2	1	0	0	1	2	2	0
Dolly Varden (SBRD)	2	3	2	2	0	3	3	0	0
Donaldson (SLRD)	1	1	0	0	0	0	1	0	0
Doris (HHRD)	2	2	2	0	0	2	0	0	0
Drumming (SBRD)	2	0	0	0	0	0	0	0	0
Dudley (HHRD)	2	2	1	0	0	1	0	3	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Dunsire (TLRD)	2	2	1	0	0	1	2	2	0
Dupuy (GVRD)	2	0	1	0	0	1	0	0	0
East Fork (SBRD)	2	0	1	0	0	1	0	3	0
East Fork Swift (TLRD)	2	2	1	0	0	0	2	2	0
East Sanko (TLRD)	2	2	0	0	0	1	2	2	0
Elelehum (GVRD)	2	0	2	0	0	2	2	0	0
Elk (HHRD)	2	2	2	0	0	2	0	0	0
Elk (SBRD)	2	0	0	0	0	0	0	0	0
Elk (SLRD)	3	3	2	0	0	2	2	2	2
Emery (HHRD)	2	2	2	3	0	2	0	0	0
Essex (HHRD)	2	2	2	0	0	2	0	0	0
Evers (TLRD)	2	2	1	0	1	1	2	2	0
Falls (SLRD)	3	2	1	0	0	1	1	0	0
Fatty (SLRD)	3	0	2	0	0	2	1	0	2
Fawn (HHRD)	1	0	1	0	0	2	0	0	0
Feather (SBRD)	2	0	0	0	0	0	0	0	0
Feline (SBRD)	2	0	1	0	0	1	0	0	0
Felix (HHRD)	2	2	1	0	0	1	0	0	0
Fiction (SBRD)	2	0	1	0	0	1	1	0	0
Fire (HHRD)	2	2	1	0	0	1	0	0	0
Fish (TLRD)	2	2	1	0	1	1	2	2	0
Fitzsimmons (TLRD)	2	2	1	0	1	1	2	2	0
Flat (SBRD)	2	0	0	0	0	0	0	0	0
Foolhen (SBRD)	2	1	2	0	0	2	1	0	0
Forest (HHRD)	2	2	2	0	0	2	0	0	0
Freeland (SLRD)	1	1	0	0	0	0	1	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Frenchy (SLRD)	3	0	1	0	0	2	2	0	2
Furious (SBRD)	2	0	0	0	0	0	0	0	0
Gabe (SBRD)	2	0	0	0	0	0	0	0	0
Garnet (SBRD)	2	0	0	0	0	0	0	0	0
Gateway (SBRD)	2	3	3	0	4 Eligible	4 Eligible	2	3	0
George (SBRD)	2	1	1	0	0	1	0	0	0
Gergen Creek (TLRD)	2	2	2	0	1	1	2	2	0
Giefer (HHRD)	2	2	2	0	0	2	0	0	0
Gildart (SLRD)	1	0	1	0	0	1	1	3	3
Gill (SBRD)	2	0	0	0	0	0	0	0	0
Glacier (SLRD)	3	2	2	0	0	3	3	2	2
Goat (SLRD)	3	3	2	0	0	2	2	2	0
Good (TLRD)	2	2	2	0	2	1	2	2	0
Gordon (SBRD)	2	3	2	3	0	2	1	2	0
Gorge (SBRD)	2	2	3	0	0	3	3	0	0
Granite (HHRD)	3	3	2	0	0	2	1	0	0
Graves (HHRD)	2	2	2	3	0	3	2	2	0
Gregg (TLRD)	2	2	1	0	0	1	2	3	0
Griffin (TLRD)	2	2	2	1	2	2	2	2	0
Groom (SLRD)	2	3	1	0	0	1	1	0	0
Grouse (SBRD)	2	0	2	0	0	2	1	0	0
Gyp (SBRD)	2	0	0	0	0	0	0	0	0
Hahn (SBRD)	2	1	2	3	3	2	0	0	0
Hall (SLRD)	2	2	2	0	0	2	2	2	0
Hallowat (GVRD)	2	3	2	0	0	1	0	0	0
Hand (TLRD)	2	2	2	0	1	2	2	2	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Harris (HHRD)	2	2	1	0	0	2	0	0	0
Harrison (SBRD)	2	0	0	0	0	0	0	0	0
Haskill (TLRD)	2	2	2	0	2	2	2	2	0
Hay (GVRD)	2	2	2	0	0	2	1	0	0
Head (SBRD)	2	1	2	0	0	2	1	0	0
Helen (SBRD)	2	1	2	0	0	2	1	0	0
Helio (SBRD)	2	0	0	0	0	0	0	0	0
Hell Roaring (TLRD)	2	2	2	0	2	2	2	2	0
Hemlock (SLRD)	3	2	2	0	0	2	1	0	2
Hemlock (TLRD)	2	2	1	0	0	1	2	2	0
Herrick Run (SLRD)	3	2	1	0	0	2	2	0	2
Herrig (TLRD)	2	2	2	0	1	1	2	2	0
Highrock (SBRD)	2	0	0	0	0	0	0	0	0
Hilburn (SLRD)	1	1	0	0	0	0	1	0	0
Hodag (SBRD)	2	1	0	0	0	0	0	0	0
Hoke (HHRD)	2	0	1	0	0	2	0	0	0
Holbrook (SBRD)	2	1	2	3	3	2	0	0	0
Holland (SLRD)	2	3	3	3	2	2	2	0	0
Hoop (SBRD)	2	0	0	0	0	0	0	0	0
Hungry (SBRD)		1	2	0	0	2	1	0	0
Hungry Horse (HHRD)	2	2	1	0	0	1	0	3	0
Ingalls (TLRD)	2	2	2	0	2	2	2	2	0
Inspiration (SBRD)	2	0	2	0	0	2	1	0	0
Jeff (SBRD)	2	0	0	0	0	0	0	0	0
Jenny (SBRD)	2	0	1	0	0	1	0	0	0
Jim (SLRD)	3	3	2	0	0	2	2	2	2

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Johnson (SLRD)	2	0	1	0	0	2	2	0	0
Johnson (TLRD)	2	2	1	0	1	1	2	3	0
Jones (HHRD)	2	1	2	0	0	2	0	2	0
Juliet (SBRD)	2	1	2	0	0	3	1	2	0
Jumbo (SBRD)	2	0	0	0	0	0	0	0	0
Jungle (SBRD)	2	0	0	0	0	0	2	0	0
Kate (HHRD)	2	0	1	0	0	1	0	0	0
Ketchikan (GVRD)	2	2	1	0	0	2	0	0	0
Kid (SBRD)	2	0	0	0	0	0	0	0	0
Kimmerly (GVRD)	2	0	2	0	0	2	1	3	0
King (TLRD)	2	2	1	0	0	1	2	2	0
Kletomus (GVRD)	2	2	1	0	0	2	0	0	0
Knief (HHRD)	2	1	1	0	0	1	0	0	0
Kraft (SLRD)	3	2	2	0	0	2	1	0	2
Lamoose (SBRD)	2	0	0	0	0	0	0	0	0
Langford (GVRD)	2	2	1	0	0	1	0	2	0
Larch (SBRD)	2	0	0	0	0	0	0	0	0
Late (SBRD)	2	0	0	0	0	0	0	0	0
Le Beau (TLRD)	2	2	3	2	4 Eligible	4 Eligible	4 Eligible	2	4 Eligible
Lewis (SBRD)	2	0	0	0	0	0	0	0	0
Lick (SBRD)	2	1	0	0	0	0	0	0	0
Lid (HHRD)	2	1	1	0	0	1	0	0	0
Lime (SBRD)	2	0	0	0	0	0	0	0	0
Lime (SBRD)	2	0	1	0	0	1	0	0	0
Lime (SLRD)	1	0	1	0	0	1	1	0	0
Limestone (SBRD)	2	1	0	0	0	0	0	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Link Lake (GVRD)	2	2	2	0	0	2	1	3	0
Lion (SLRD)	3	3	2	3	0	2	2	0	0
Listle (TLRD)	2	2	2	0	1	2	2	2	0
Little (SBRD)	2	0	0	0	0	0	0	0	0
Little Bitterroot (SLRD)	2	1	1	0	0	3	3	0	2
Little Calf (SBRD)	2	0	0	0	0	0	0	0	0
Little Salmon (SBRD)	3	4 Eligible	2	4 Eligible	0	4 Eligible	3	0	0
Lodgepole (SBRD)	2	3	1	0	0	1	0	0	0
Logan (HHRD)	2	2	2	0	0	2	0	0	0
Logan (TLRD)	3	3	4 Eligible	1	2	4 Eligible	3	2	1
Long (HHRD)	2	2	2	0	0	2	0	0	0
Lookout (GVRD)	2	1	0	0	0	1	0	0	0
Lost (SLRD)	2	3	2	0	0	2	2	3	0
Lost (TLRD)	2	2	2	0	1	2	2	2	0
Lost Jack (SBRD)	2	1	1	0	0	1	1	0	0
Lost Johnny (HHRD)	2	2	2	0	0	2	0	0	0
Lost Mare (HHRD)	2	2	1	0	0	1	0	0	0
Lower Twin (SBRD)	2	2	2	3	0	2	1	0	0
Margaret (HHRD)	2	2	1	0	0	1	0	0	0
Marion (HHRD)	2	1	2	0	0	2	0	0	0
Marshall (SBRD)	2	1	1	0	0	3	1	0	0
Martin (TLRD)	2	2	2	1	2	3	2	2	0
Mathias (GVRD)	2	2	0	0	0	2	0	0	0
McGinnis (GVRD)	2	1	2	0	0	1	0	0	0
McInerie (HHRD)	2	2	1	0	0	1	0	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
McKay (SLRD)	2	0	1	0	0	1	1	0	0
Meadow (SBRD)	2	0	0	0	0	0	0	0	0
Meadow (SLRD)	2	1	1	0	0	1	1	0	0
Meadow (TLRD)	2	2	2	0	1	2	2	2	0
Mid (SBRD)	2	1	1	0	0	1	1	0	0
Middle Fork (SBRD)	2	2	1	0	0	1	1	0	0
Middle Fork Dayton (SLRD)	2	1	1	0	0	1	2	0	0
Middle Fork Porcupine (SLRD)	1	0	1	0	0	1	1	0	0
Milk (SBRD)	2	0	0	0	0	0	0	0	0
Miller (TLRD)	2	2	2	0	2	2	2	2	0
Miner (SBRD)	2	2	2	0	0	2	1	0	0
Moccasin (HHRD)	2	1	2	0	0	2	0	0	0
Molly (SBRD)	2	0	2	0	0	2	2	0	0
Moore (SLRD)	3	0	1	0	0	2	1	0	2
Moose (GVRD)	2	2	2	0	0	2	1	3	0
Moran (GVRD)	2	2	1	0	0	2	0	3	0
Morrison (HHRD)	2	3	2	0	0	2	0	0	0
Morrison (SBRD)	2	3	2	0	0	2	0	0	0
Murray (HHRD)	2	2	1	0	0	2	0	0	0
Nanny (SBRD)	2	0	0	0	0	0	0	0	0
Nicola (GVRD)	2	2	1	0	0	2	0	0	0
Ninko (GVRD)	2	2	2	0	3	2	1	0	0
Noisy (SLRD)	2	0	2	3	3	2	1	0	0
Nokio (GVRD)	2	2	1	4 Eligible	2	2	1	0	0
North (SBRD)	2	0	0	0	0	0	0	0	0
North Fork Cedar (SLRD)	3	0	2	0	0	2	2	0	2

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
North Fork Cold (SLRD)	3	2	2	0	0	2	2	0	2
North Fork Elk (SLRD)	3	2	2	0	0	2	2	0	2
North Fork Evers (TLRD)	2	2	2	0	1	2	2	2	0
North Fork Fitzsimmons (TLRD)	2	2	1	0	0	1	2	2	0
North Fork Helen (SBRD)	2	0	0	0	0	0	0	0	0
North Fork Hemlock (SLRD)	3	0	2	0	0	2	2	0	2
North Fork Lost (SLRD)	2	3	2	3	3	2	2	0	0
North Fork Porcupine (SLRD)	2	0	1	0	0	1	1	3	3
Oettiker (TLRD)	2	2	2	0	1	2	2	2	0
Otila (HHRD)	2	0	1	0	0	2	0	0	0
Otis (SBRD)	2	1	0	0	0	0	0	0	0
Otter (SBRD)	2	0	1	0	0	1	0	0	0
Owl (SLRD)	3	2	2	0	0	2	1	0	0
Pagoda (SBRD)	2	0	0	0	0	0	0	0	0
Paint (HHRD)	2	0	1	0	0	1	0	0	0
Palisade (SBRD)	2	1	1	0	0	1	0	0	0
Paola (HHRD)	2	1	1	0	0	2	0	0	0
Patrick (SLRD)	1	1	1	0	0	1	1	0	0
Patterson (SLRD)	2	0	2	0	0	2	2	0	0
Pedro (SBRD)	2	0	2	0	0	2	1	0	0
Peggy (SBRD)	2	0	0	0	0	1	1	0	0
Pendant (SBRD)	2	2	1	0	3	1	0	2	0
Pentagon (SBRD)	2	1	2	2	0	2	1	0	0
Peters (SBRD)	2	0	0	0	0	0	0	0	0
Peterson (SLRD)	2	0	2	0	0	2	2	0	0
Phil (SBRD)	2	1	0	0	0	0	0	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Picture (SBRD)	2	0	0	0	0	1	1	0	0
Pierce (SLRD)	3	1	1	0	0	1	2	2	0
Pine (SBRD)	2	1	0	0	0	0	0	0	0
Piper (SLRD)	3	3	2	0	0	2	2	3	2
Plume (TLRD)	2	2	2	0	1	2	2	2	0
Pony (SLRD)	3	2	2	0	0	2	2	2	0
Porcupine (SLRD)	2	1	2	0	0	1	1	3	3
Porter (SLRD)	2	1	0	0	0	1	1	0	0
Potter (TLRD)	2	2	2	0	1	2	2	2	0
Puma (SBRD)	2	0	0	0	0	0	0	0	0
Puzzle (HHRD)	2	2	1	0	0	2	0	0	0
Quintonkon (SBRD)	2	2	3	3	0	2	2	0	0
Rampart (SBRD)	2	0	1	0	0	1	1	0	0
Rand (TLRD)	2	2	2	0	1	2	2	2	0
Rapid (SBRD)	2	2	2	2	0	2	1	0	0
Razzle (SBRD)	2	0	0	0	0	0	0	0	0
Red Butte (SLRD)	3	2	2	0	0	2	1	0	2
Red Meadow (GVRD)	3	3	2	0	0	2	0	3	0
Reef (SBRD)	2	0	0	0	0	0	0	0	0
Reid (TLRD)	2	2	2	0	1	2	2	2	0
Remington (HHRD)	2	1	0	0	0	1	0	0	0
Riverside (HHRD)	2	2	1	0	0	2	0	0	0
Roaring (SBRD)	2	1	1	0	0	1	1	0	0
Robertson (TLRD)	2	2	2	0	1	2	2	2	0
Rocky (SLRD)	2	0	2	0	0	2	1	2	0
Rooney (SBRD)	2	0	2	0	0	2	1	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Ross (SBRD)	2	0	1	0	0	1	0	0	0
Rumble (SLRD)	2	2	2	0	0	2	2	0	0
Russky (TLRD)	2	2	1	0	1	1	1	2	0
Ryle (HHRD)	2	2	1	0	0	1	0	0	0
Sandstone (SBRD)	2	0	1	0	0	1	0	0	0
Sanko (TLRD)	2	2	1	0	1	1	2	3	0
Sappho (SBRD)	2	0	0	0	0	0	0	0	0
Sarah (SBRD)	2	0	0	0	0	0	0	0	0
Scalp (SBRD)	2	0	1	0	0	1	0	0	0
Scarface (SBRD)	2	0	0	0	0	0	0	0	0
Schafer (SBRD)	2	2	2	0	0	2	1	0	0
Schmidt (SLRD)	2	1	1	0	0	1	2	0	0
Scout (SLRD)	3	0	1	0	0	2	1	0	0
Seagrid (HHRD)	2	1	1	0	0	1	0	0	0
Sergeant (SBRD)	2	2	1	0	0	1	1	0	0
Shaw (SBRD)	2	1	1	0	0	1	0	0	0
Sheep (HHRD)	2	2	2	0	0	2	0	0	0
Sheppard (TLRD)	2	2	2	1	2	2	2	2	0
Shorty (GVRD)	2	2	1	0	0	2	0	0	0
Silvertip (SBRD)	2	2	2	0	0	2	3	2	0
Simpson (SLRD)	3	2	1	1	3	2	2	2	0
Sinclair (TLRD)	2	2	1	0	1	1	2	2	0
Sixmile (SLRD)	2	3	2	0	0	2	2	0	0
Skookoleel (GVRD)	2	2	1	0	0	2	0	0	0
Skyland (HHRD)	2	2	1	0	0	2	0	0	0
Slick (SBRD)	2	1	0	0	0	1	1	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Slide (SBRD)	2	2	0	0	0	0	0	0	0
Slim (SBRD)	2	0	0	0	0	0	0	0	0
Smith (SLRD)	3	2	2	0	0	2	2	2	0
Smith (TLRD)	2	2	1	0	0	1	2	2	0
Smoke (TLRD)	2	2	1	0	1	1	2	2	0
Smokey (SBRD)	2	2	3	0	0	2	1	2	0
Soldier (SBRD)	2	1	1	3	0	1	0	0	0
Soup (SLRD)	3	2	2	0	0	3	2	2	0
South (SBRD)	2	1	0	0	0	0	0	0	0
South Fork (SBRD)	2	0	0	0	0	0	0	0	0
South Fork Abbot (HHRD)	2	0	1	0	0	1	0	0	0
South Fork Barber (SLRD)	2	1	1	0	0	1	1	0	0
South Fork Canyon (GVRD)	2	2	0	0	0	1	0	0	0
South Fork Cedar (SLRD)	3	2	1	0	0	2	1	0	2
South Fork Coal (GVRD)	2	2	1	0	0	2	0	0	0
South Fork Cold (SLRD)	3	2	2	0	0	2	2	0	2
South Fork Elk (SLRD)	3	2	2	0	0	2	2	0	2
South Fork Flathead (HHRD)	2	2	2	0	0	2	1	0	0
South Fork Lion (SLRD)	2	2	2	0	0	2	2	0	0
South Fork Logan (HHRD)	2	2	1	0	0	1	0	0	0
South Fork Lost (SLRD)	2	3	2	3	3	2	2	0	0
South Fork Red Meadow (GVRD)	2	2	0	0	0	2	0	0	0
South Fork Rumble (SLRD)	2	2	2	0	0	2	2	0	0
South Fork Shorty (GVRD)	2	2	1	0	0	2	0	3	0
South Fork White (SBRD)	2	2	1	0	0	2	1	0	0
Spotted Bear River (SBRD)	4 Eligible	3	4 Eligible	3	2	3	3	3	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Spring (SBRD)	2	0	0	0	0	0	0	0	0
Spring (SLRD)	2	1	1	0	0	2	2	2	0
Spruce (GVRD)	2	0	0	0	0	1	0	0	0
Spruce (SBRD)	2	0	1	0	0	1	0	0	0
Spud (SBRD)	2	0	0	0	0	0	0	0	0
Squaw Meadows (TLRD)	2	2	2	0	1	2	2	2	0
Squeezer (SLRD)	2	3	2	0	0	2	2	2	0
Stadium (SBRD)	2	2	1	0	0	1	1	0	0
Stadler (SBRD)	2	1	2	0	0	2	1	0	0
Stanton (HHRD)	2	2	2	0	0	2	0	3	0
Star (TLRD)	2	2	1	0	1	1	2	2	0
Stillwater (TLRD)	2	2	3	1	2	3	2	2	0
Stoner (SLRD)	2	1	1	0	0	2	2	0	0
Stopher (SLRD)	1	1	1	0	0	1	1	0	0
Strawberry (SBRD)	2	3	3	0	0	3	2	0	0
String (SBRD)	2	0	0	0	0	0	0	0	0
Sugarloaf (SBRD)	2	0	0	0	0	0	0	0	0
Sullivan (SBRD)	3	2	2	3	3	2	2	0	0
Sunburst (SBRD)	2	0	3	0	0	3	3	0	0
Swan (SLRD)	3	2	3	3	3	2	2	3	3
Swaney (TLRD)	2	2	2	0	1	2	2	2	0
Swanson (TLRD)	2	2	2	0	1	2	2	2	0
Swede (TLRD)	2	2	1	0	1	1	2	2	0
Swift (SBRD)	2	0	0	0	0	0	0	0	0
Tango (SBRD)	2	0	0	0	0	1	0	0	0
Tanner (SBRD)	2	0	1	0	0	1	0	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Taylor (SBRD)	2	0	0	0	0	0	0	0	0
Taylor (TLRD)	2	2	2	0	1	2	2	2	0
Tent (HHRD)	2	2	1	0	0	1	0	0	0
Tepee (GVRD)	2	1	2	0	0	2	0	3	0
Thoma (GVRD)	2	2	2	0	0	2	0	0	0
Three Sisters (SBRD)	2	1	1	0	0	1	0	0	0
Tiger (HHRD)	2	2	1	0	0	1	0	0	0
Tin (SBRD)	2	1	0	3	0	0	0	0	0
Tobie (TLRD)	2	2	2	0	1	2	2	2	0
Trail (GVRD)	4 Eligible	4 Eligible	2	4 Eligible	2	2	4 Eligible	0	0
Trail (SBRD, Spotted Bear River drainage)	2	1	1	2	0	1	0	0	0
Trail (SBRD, Strawberry Creek drainage)	2	1	1	0	0	1	0	0	0
Trail (TLRD)	2	2	2	3	1	2	3	2	0
Trapper (HHRD)	2	1	1	0	0	2	0	0	0
Trickle (SBRD)	2	1	2	0	0	2	1	0	0
Trixie (TLRD)	2	2	2	0	1	2	2	2	0
Truman (SLRD)	2	1	2	0	0	2	2	0	0
Trumbull (GVRD)	2	0	1	0	0	1	0	0	0
Tuchuck (GVRD)	2	2	2	0	0	2	0	2	3
Tunnel (HHRD)	3	3	2	0	0	2	0	0	0
Turmoil (HHRD)	2	0	1	0	0	2	0	0	0
Twentyfive Mile (HHRD)	2	2	2	0	0	2	0	0	0
Una (SBRD)	2	0	1	0	0	1	0	3	0
Unawah (HHRD)	2	1	1	0	0	2	0	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Twin (also known as Upper Twin) (SBRD)	2	2	2	3	0	2	1	0	0
Waldbillig (SBRD)	2	0	0	0	0	0	0	0	0
Wall (SBRD)	2	1	1	0	0	3	3	0	0
Warrior (SBRD)	2	0	0	0	0	0	0	0	0
Werner (GVRD)	2	1	1	0	0	2	0	0	0
Werner (TLRD)	2	2	2	0	1	2	2	2	0
West Fork (SBRD)	2	0	0	0	0	0	0	0	0
West Fork Dayton (SLRD)	2	2	1	0	0	1	2	0	0
West Fork Wall (SBRD)	2	0	1	0	0	1	1	0	0
Whale (GVRD)	3	3	2	0	0	2	0	0	0
Wheeler (HHRD)	2	3	2	0	0	2	0	0	0
Whistler (SBRD)	2	1	1	0	0	1	0	0	0
Whitcomb (SBRD)	2	1	1	0	0	3	1	0	0
White (SBRD)	2	0	1	0	0	1	0	0	0
White (SBRD)	3	4 Eligible	0	4 Eligible	4 Eligible	3	4 Eligible	3	0
Whitetail (SLRD)	3	1	1	0	0	1	2	2	0
Wigwam (SBRD)	2	0	0	0	0	0	0	0	0
Wild Bill (SLRD)	2	1	2	0	0	2	2	0	0
Wildcat (HHRD)	2	2	2	0	0	2	0	0	0
Wildrose (SBRD)	2	0	1	0	0	1	0	0	0
Willow (SBRD)	2	0	0	0	0	0	0	0	0
Windfall (SLRD)	3	1	1	0	0	1	2	3	0
Winter (SBRD)	2	1	1	0	0	1	0	0	0
Wolf (SLRD)	2	2	2	0	0	2	2	0	0
Woodfir (SBRD)	2	1	0	0	0	0	0	0	0

Stream Name (Ranger District ¹)	Wildlife	Fish	Recreation	Pre-history	History	Scenery	Geology	Botany	Natural Areas
Woodward (SLRD)	2	3	2	0	0	2	2	2	0
Wounded Buck (HHRD)	3	3	2	0	0	2	0	0	0
Wyman (SLRD)	2	1	2	0	0	2	2	0	0
Yakinikak (GVRD)	2	3	1	4 Eligible	3	2	0	0	0
Yew (SLRD)	2	0	1	0	0	2	2	0	0
Youngs (SBRD)	2	3	2	3	0	2	1	0	0

1. SBRD = Spotted Bear Ranger District; HHRD = Hungry Horse Ranger District; GVRD = Glacier View Ranger District; SLRD = Swan Lake Ranger District; TLRD = Tally Lake Ranger District. Refer to table 5-5 for ranking definitions

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Summary of Eligible Wild and Scenic Rivers

Table 5-8 displays each of the eligible wild and scenic rivers on the Flathead National Forest by their segment, preliminary classification, outstandingly remarkable value, and length. This table combines the eligible rivers from the 2004 and the 2014 processes.

Table 5-8. Eligible wild and scenic rivers

River	Segment	Preliminary Classification	Outstanding Remarkable Values	Length (miles)
Aeneas	Headwaters to Hungry Horse Reservoir	Scenic	History, prehistory, recreation, scenery	5
Big Salmon	Lena Lake to South Fork of Flathead River; includes Big Salmon Lake	Wild	Recreation, geology, fish, prehistory	19
Clack	Headwaters to Middle Fork of Flathead River	Wild	Geology, scenery	8
Danaher	Headwater to Youngs Creek	Wild	Scenery, recreation, fish, wildlife, history, prehistory, botany, natural area	23
Elk	Headwaters to Forest boundary	Scenic	Fish	10
Gateway	Headwater to Strawberry Creek	Wild	Scenery, geology, history	5
Glacier	Headwaters to outlet of Glacier Slough	Wild segment: within Mission Mountains Wilderness; Scenic segment: wilderness boundary to outlet of Glacier Slough	Geology, wildlife, scenery	6
Graves	Headwaters to Hungry Horse Reservoir	Wild segment: within Jewel Basin Scenic segment: from boundary of Jewel Basin to Hungry Horse Reservoir	Prehistory	10
Le Beau	Headwaters to Le Beau Research Natural Area boundary	Wild	Scenic, geological, natural area	4
Lion	Source to Lion Creek trailhead	Scenic	Wildlife	11
Little Salmon	Headwaters to South Fork of Flathead River	Wild	Scenery, fish, prehistory	19
Logan	From Road 539 to Tally Lake	Recreational	Scenic, recreational	4
Schafer	Headwaters to Middle Fork of Flathead River	Wild	Prehistory, history	11

River	Segment	Preliminary Classification	Outstanding Remarkable Values	Length (miles)
Spotted Bear	Headwaters to South Fork of Flathead River	Wild segment: headwaters to end of Blue Lake; Recreational segment: Blue Lake to South Fork of Flathead River	Recreation, wildlife, geology	35
Strawberry	Headwaters to Middle Fork of Flathead River	Wild	Fish	14
Swan, lower	Swan River State Forest to Swan Lake	Recreation	Wildlife	11
Swan, upper	Crystal Lake to confluence with Lindbergh Lake	Wild	Recreation	2
Twin (also known as Upper Twin)	Nanny Creek to confluence with North Creek	Wild	Geology, Scenery	6
	North Creek to Confluence with South Fork of the Flathead River	Recreational		
Whale	Headwaters to Forest boundary	Scenic segment: Headwaters to confluence with Shorty Creek; Recreational segment: Shorty Creek to Forest boundary	Wildlife, Fish	21
White	Entire segment	Wild	Geology, fish, history, prehistory, scenery	24
Nokio	Nokio Creek along NFS Road 114 to confluence with Yakinikak Creek;	Scenic	Prehistory	3
Yakinikak	Yakinikak Creek to confluence with Thoma Creek (stream becomes Trail Creek);	Scenic	Prehistory	8
Trail (North Fork)	Trail Creek to Forest boundary	Scenic	Fish, geology, prehistory, wildlife	2
Youngs	Headwaters to South Fork of Flathead	Wild	Fish, recreation, prehistory, history, scenery	23

References

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Appendix A: Review of eligible wild and scenic rivers based on public comments on the draft EIS

On March 22, 2017, Marsha Moore, recreation planner on the revision team assigned to the wild and scenic rivers resource area, and Pat Van Eimeren, fisheries biologist on the revision team, reviewed the rivers that were raised in public comments to see if the original determination of eligibility was still valid.

To determine eligibility, each resource specialist used specific criteria and measures to evaluate each river (stream⁶) or segment for outstandingly remarkable values. Based on this evaluation, documentation was completed for each stream on why it was or was not eligible. Table 5-2 displays how values were ranked. Each stream was ranked based on the following qualitative scoring scale (table 5-9) comparing it to other streams in the region of comparison. A ranking of 4 translated to an outstandingly remarkable value, which then made that stream (or stream segment) eligible.

Table 5-9. Quantitative ranking of values

Score	Value in Region
0	Nonexistent
1	Less than most
2	Typical
3	One of a few this significant in region ⁷
4	Most significant in region

For the review, the results in the documentation sheets for each river by resource area (wildlife, fish, geology, scenery, recreation, prehistory/history) (USDA, 2004/2014) were compared to the Wild and Scenic River Eligibility Study Process paper in appendix 5 of the draft EIS, summary table 5-2. Four typographic errors were found in table 5-2 when compared to the supporting data on the documentation sheets. None of the errors resulted in a change of eligibility. These errors have been corrected in table 5-2 in this document:

1. Gorge Creek was incorrectly marked a 3 for fish in appendix 5, table 5-2; the documentation sheet ranked it a 2.
2. Twin Creek (also known as Upper Twin Creek) was incorrectly marked a 2 for scenery in appendix 5, table 5-2; the documentation sheet ranked it a 3.
3. Lower Twin Creek was incorrectly marked a 3 for scenery in appendix 5, table 5-2; the documentation sheet ranked it a 2.
4. Lower Twin Creek was incorrectly marked as a 3 for wildlife in appendix 5, table 5-2; the documentation sheet ranked it a 2.

Public comments requested the following rivers, listed in table 5-10, to be eligible (ranked a 4): Basin, Bunker, Dolly Varden, Gordon, Gorge, Granite, Lake, Morrison, Twin, Lower Twin, and Quintonkon Creeks. Table 5-10 lists the river segment, the requested outstandingly remarkable value the commenters requested, the current ranking of the outstandingly remarkable values, and

⁶ Although the guidance speaks to “rivers” all of the waterways consist of creeks and streams.

⁷ Although rivers scored a 3 may be regionally important, they do not possess a river-related value that is unique or rare or an exemplary feature that is significant when compared with similar values from other rivers at a regional or national scale.

the outcome of the review. Twin Creek became a new eligible river based on the new ranking for its outstandingly remarkable values for scenery and geology. Although not requested by the public to be eligible, during the review the fisheries biologist realized the outstandingly remarkable value for fish for Whale Creek was incorrectly determined to be a 2 and should have been ranked a 4; this adds another outstandingly remarkable value to this eligible river (it was already eligible for wildlife).

Table 5-10. Name, outstandingly remarkable value requested by commenters, current ranking of the outstandingly remarkable values, and outcome of the 2017 review

River Name	Requested outstandingly remarkable values to be ranked a 4⁸	Current ranking of outstandingly remarkable values	Outcome of review
Basin	Fish, Recreation, Scenery	Fish – 3, Recreation – 2, Scenery – 3	No change.
Bunker	Fish, Recreation, Scenery, Wildlife	Fish – 2, Recreation – 2, Scenery – 2, Wildlife – 3	No change.
Dolly Varden	Fish, Recreation, Scenery	Fish – 3, Recreation – 2, Scenery – 2,	No change.
Gordon	Fish, Recreation, Scenery	Fish – 3, Recreation – 2, Scenery – 2,	No change.
Gorge	Recreation	Recreation – 2	No change.
Granite	Fish, History, Recreation, Scenery	Fish – 3, History – 3, Recreation – 2, Scenery – 2	No change.
Lake	Geology, History, Scenery	Geology – 2, History – 1, Recreation – 1	No change.
Morrison	Fish, Wildlife	Fish – 2, Wildlife – 3	No change.
Twin (also known as Upper Twin)	Fish, Recreation, Scenery, Wildlife	Fish – 2, Recreation – 2, Scenery – 3, Geology – 3	The outstandingly remarkable value determinations were reviewed. The rankings for scenery and geology were changed to a 4 based on new information and a review of the measures, making this an eligible wild and scenic river.
Lower Twin	Fish, Recreation, Scenery	Fish – 2, Recreation – 2, Scenery – 2	No change.
Quintonkon	Fish, Wildlife	Fish – 2, Wildlife – 3	No change.
Whale	N/A	Fish – 2	Ranking was changed from a 2 to a 4 for fish. This river was already eligible for its outstandingly remarkable value for wildlife.

⁸ A ranking of 4 meant it was most significant in region, which made it an eligible wild and scenic river.

The Forest found the rivers listed in table 5-11 to be eligible wild and scenic rivers, but public comments on the draft EIS requested that these rivers be ranked a 4 for recreation, which would add another outstandingly remarkable value to these eligible rivers. For example, Elk Creek is an eligible river based on an outstandingly remarkable value for fish, which was ranked a 4. The current ranking for recreation for Elk Creek is a 2; only a ranking of 4 translates to an outstandingly remarkable value.

Table 5-11. Name of river, its current ranking for recreation, and outcome of review

River Name	Current ranking of recreation outstandingly remarkable value	Outcome of review
Elk	2	No change.
Glacier	2	No change.
Graves	3	No change.
Lower Swan	3	No change.

The rivers listed in table 5-12 were ranked a 3 for fish. Public comments requested that all streams ranked a 3 for fish be rated as eligible.

Table 5-12. Rivers that were ranked a 3 for fish and outcome of review

River Name	Outcome of review
Basin	No change.
Clack	No change.
Dolly Varden	No change.
Gordon	No change.
Gorge	No change.
Lake	No change.
Unnamed Fork Lake Creek	No change.
Schafer	No change.
Granite	No change.

Appendix 6: Species Plan Components, Species Lists and Habitat Associations

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Plan Components and Monitoring Items for Specific Species, Ecosystems, and Key Ecosystem Characteristics

Introduction

The Forest adopted an ecosystem and species-specific approach, known as a coarse-filter/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 coarse-filter plan components are designed to maintain or restore ecological conditions for ecosystem integrity and ecosystem diversity in the plan area within Agency authority and the inherent capability of the land. Plan components found in the “Terrestrial Ecosystem and Vegetation” and “Aquatic Ecosystem” sections address most needs of animal and plant species. Fine-filter plan components are designed to provide for additional habitat or species-specific needs when those needs are not met through the coarse-filter plan components.

The plan components in table 6-1 is management direction and monitoring items that are particularly relevant to a species or species group on the Flathead National Forest. Plan components may apply at the forestwide scale (FW), the geographic area scale (GA), or the management area (MA) scale.

Table 6-1. Summary of plan components and monitoring that address specific species, key ecosystem characteristics, and stressors

Species	Desired Conditions	Objectives	Standards and Guideline	Suitability	Monitoring
Grizzly bear	FW-DC-RMZ-06; FW-DC-TE&V-01 through 04, 09, 17, 19, 23, 24; FW-DC-WL-01 through 03; FW-DC-IFS-01, 12; FW-DC-REC-01, 02, 06, 22; FW-DC-LSU-01, FW-DC-OFP-01, 04; FW-DC-GR-01; MA1a and 1b-DC-02; MA5-DC-02; GA-HH-DC-03; GA-MF-DC-04; GA-NF-DC-06, 07; GA-SM-DC-01, 03; GA-SM-MA7-Big Mtn-DC-04, 06; GA-SV-DC-09	FW-OBJ-REC-02	FW-STD-RMZ-01, 05, 06; FW-GDL-RMZ-09, 12-15; FW-GDL-TE&V -01 through 05; FW-STD-WL-01 through 03; FW-GDL-WL-01 through 03; FW-STD-IFS-01 through 04; FW-GDL-IFS-01, 02, 12, 15; FW-STD-REC-01, 02, 04, 05; FW-GDL-REC-01, 05, 06; FW-STD-OFP-01; FW-STD-E&M-01 through 07; FW-GDL-E&M-01 through 06, 08; FW-STD-GR-01 through 07; FW-GDL-GR-01, 02; GA-SM-STD-01, GA-SM-GDL-01; GA-SM-MA7-Big Mtn GDL-01	FW-SUIT-RMZ-01; MA1a-SUIT-02, 03; MA1b-SUIT-02 through 07; MA4a; MA5-SUIT-01, 03, 05, 07; MA6a-SUIT-01, 03, 04	MON- NCDE-01 through 08; MON-IFS-01
Canada lynx and their critical habitat	See appendix A; FW-DC-RMZ-06; FW-DC-TE&V-04, 08, 13, 17, 19, 23, 24; FW-DC-WL-05; MA1a and 1b-DC-02; GA-HH-DC-03; GA-MF-DC-04; GA-NF-DC-06, 07; GA-SM-DC-03; GA-SV-DC-09		See appendix A; FW-STD-RMZ-01, 06; FW-GDL-RMZ-01, 09; FW-STD-WL-04; FW-GDL-IFS-12	FW-SUIT-RMZ-01	See appendix A; MON-T&E-LYNX-01 through 04

Species	Desired Conditions	Objectives	Standards and Guideline	Suitability	Monitoring
Wolverine (also see Ungulates/big game)	FW-DC-REC-22; GA-HH-DC-03; GA-MF-DC-04; GA-NF-DC-06, 07; GA-SM-DC-03; GA-SV-DC-09		FW-GDL-WL-04; FW-GDL-REC-04, MA1a-GDL-03	MA1a-SUIT-02, 03; MA1b-SUIT-06; MA5-SUIT-03 through 07; MA6a-SUIT-03, 04	MON-WL-14, 17
Whitebark pine	FW-DC-TE&V-03, 07, 08, 12 (cold type); FW-DC-PLANT-03, 04; FW-DC-WL DIV-01 Tuchuck Research Natural Area MA 4a-DC-01, 02, 03	FW-OBJ-PLANT-01	FW-STD-TE&V-02	MA1b-SUIT-03; MA4a –SUIT-01 (Tuchuck RNA)	MON-PLANT-02, 03; MON-TE&V-01 MON- WL-05:
Water howellia	FW-DC-PLANT-01, 02; FW-DC-NNIP-01, 02; MA3b-Special Area-DC-01, 02, 04; GA-SV-DC-01, 03	FW-OBJ-NNIP-01	FW-GDL-PLANT-01, 02, 03; FW-STD-RMZ-01 and all other coarse-filter components in the Riparian Management Zone section, if more restrictive than the conservation strategy	MA3b-Special Area-SUIT; FW-SUIT-RMZ-01	MON-PLANT-01
SCC plant species—Peatland/Fen habitat group	FW-DC-PLANT DIV-01; FW-DC-WTR-03, 10, 11, 12, 13; FW-DC-RMZ-01; FW-DC-TE&V-04; FW-DC-NNIP-01, 02; MA3b-Special Area-DC-01, 02; GA-SV-DC-08	FW-OBJ-NNIP-01	FW-GDL-PLANT DIV-01, 02; FW-STD-RMZ-01, 03 through 06; FW-GDL-RMZ-02 through 06, 12, 13; FW-STD-SOIL-01; FW-GDL-SOIL-01, 02, 03; FW-GDL-REC-02, 06; FW-GDL-LSU-02, 03	MA3b-Special Area-SUIT; FW-SUIT-RMZ-01	MON-PLANT DIV-01; MON-TE&V-01
SCC plant species—Wetland/riparian habitat group	FW-DC-PLANT DIV-01; FW-DC-WTR-03, 10, 11, 12, 13; FW-DC-RMZ-01; FW-DC-TE&V-04; FW-DC-NNIP-01, 02; MA3b-Special Area-DC-01, 02; GA-SV-DC-07	FW-OBJ-NNIP-01	FW-GDL-PLANT DIV-01, 02; FW-STD-RMZ-01, 03 through 06; FW-GDL-RMZ-02 through 06, 14, 15; FW-STD-SOIL-01; FW-GDL-SOIL-01, 02, 03; FW-GDL-REC-02, 06; FW-GDL-LSU-02, 03; FW-STD-GR-07, 08; FW-GDL-GR-01, 03, 04	MA3b-Special Area-SUIT; FW-SUIT-RMZ-01	MON-PLANT DIV-01; MON-TE&V-01
SCC plant species—Upland habitat group (mesic montane, rock/talus/scree, and disturbance-associated)	FW-DC-PLANT DIV-01; FW-DC-TE&V-04; FW-DC-TE&V-07 through 25; FW-DC-NNIP-01, 02; FW-DC-GR-03; MA3b-Special Area-DC-01, 02	FW-OBJ-NNIP-01	FW-GDL-PLANT DIV-01, 02; FW-STD-SOIL-01, 02; FW-GDL-SOIL-01 through 04; FW-GDL-GR-01, 03	MA6a-SUIT	MON-PLANT DIV-01; MON-TE&V-01
Focal Species—Western white pine	FW-DC-TE&V-07, 08, 12, 14, 19; GA-SV-DC-07	FW-OBJ-TE&V-02			MON-TE&V-01; MON-TE&V Focal-01, 02

Species	Desired Conditions	Objectives	Standards and Guideline	Suitability	Monitoring
Most terrestrial invertebrate species (e.g., carinate mountainsnail, pollinators)	FW-DC-WTR-02 through 05; FW-DC-CAVE-01; FW-DC-TE&V-09,15,17,19; FW-DC-POLL-01; FW-DC-GR-03; GA-SV-DC-11	FW-OBJ-TE&V-04	FW-STD-RMZ-01; GA-SV-GDL-02, FW-GDL-SOIL-01 through 04, FW-GDL-TE&V-08	FW-SUIT-RMZ-01; MA6a-SUIT	
Most aquatic species, including but not limited to bull trout and westslope cutthroat trout	Coarse filter plan components under Watersheds, Conservation Watershed Network, Riparian Management Zones, Soils, and FW-DC-IFS-07;	FW-OBJ-WTR-01-04; FW-OBJ-CWN-01 and 02; FW-OBJ-RMZ-01; FW-OBJ-IFS-01 and 03; GA-SV-OBJ-04	Coarse filter plan components under Watersheds, Conservation Watershed Network, Riparian Management Zones, Soils, Infrastructure, Grazing and Recreation FW-GDL-REC-02, 06, FW-STD-IFS-05 through 07, FW-GDL-IFS-03 through 10 and 13 through 16, FW-GDL-LSU-02 and 03, FW-STD-GR-07, 08; FW-GDL-GR-03 and 04.	FW-SUIT-RMZ-01	MON-WTR-01 through 07 and MON-IFS-02 and 03; MON-WL-01, 07, 16
Most wildlife species associated with aquatic, wetland, and riparian ecosystems	FW-DC-WTR-01 through 14; FW-DC-CWN-01, FW-OBJ-CWN-01 through 15; FW-DC-RMZ-01 through 06; MA 3b-Special Areas (fens)desired conditons; FW-DC-WL DIV-01; FW-DC-IFS-07, 08; GS-SV-DC-07, 08	FW-OBJ-RMZ-01; GA-SV-OBJ-04	FW-STD-WTR-02, FW-GDL-WTR-01, 02, 04, 06, 07, 08; FW-GDL-CWN-01; FW-GDL-RMZ 01 through 14; FW-GDL-WL DIV-02 and 05; FW-GDL-REC-02; FW-STD-IFS-05,06,07; FW-GDL-IFS-03 through 10, and 13 through 16; FW-STD-E&M-05; FW-GDL-E&M-07 and 08; FW-STD-GR-07, 08; FW-GDL-GR-01, 03, 04; FW-GDL-LSU-02, 03	FW-SUIT-RMZ-01	MON-WTR-03, 07; MON-WL-04, 15, 16
Black swift (SCC)	FW-DC-WL DIV-01; FW-DC-WTR-04, 06, 08, 10, 17; MA1a-DC-01, 02; MA1b-DC-01 09 MA1b-DC-02 through 06		FW-GDL-WL DIV-05; FW-GDL-WTR-09; FW-STD-RMZ-01, 04, 06;	FW-SUIT-RMZ-01;	
Most wildlife species associated with grasses/forbs/shrubs and hardwood trees	FW-DC-RMZ-04; FW-DC-TE&V-09, 13, 18, 19, 23, 24, 25; FW-DC-NNIP-01 through 04; FW-DC-POLL-01	FW-OBJ-TE&V-03, 04; FW-OBJ-NNIP-01; FW-OBJ-WL DIV-01	FW-GDL-NNIP-01		MON-NNIP-01; MON- WL-08, 09
Most wildlife species associated with snags and burned forest (e.g., black-backed woodpecker)	FW-DC-RMZ-03; FW-DC-TE&V-03, 12, 14 through 16, 20, 23, 24, 25; FW-DC-WL DIV-01; FW-DC-TIMB-05	FW-OBJ-TE&V-01, 04	FW-GDL-RMZ-08, 10; FW-STD-TE&V-03; FW-GDL-TIMB-01 through 03; FW-GDL-OF-01; GA-HH-STD-01; GA-MF-STD-02; GA-NF-STD-01; GA-SM-STD-02; GA-SF-STD-01; GA-SV-STD-01		MON-TE&V-05, MON-WL-10, 11, 13

Species	Desired Conditions	Objectives	Standards and Guideline	Suitability	Monitoring
Most wildlife species associated with old growth forest, very large trees, and downed wood	FW-DC-TE&V-10 through 17, 19; FW-DC-RMZ-03 through 06; FW-DC-WL DIV-01;		FW-STD-RMZ-01; FW-STD-TE&V-01, 03; FW-GDL-TE&V-06, 07, 08, 09; FW-GDL-TIMB-01 through 03; GA-HH-STD-01; GA-MF-STD-02; GA-NF-STD-01; GA-SM-STD-02; GA-SF-STD-01; GA-SV-STD-01; FW-GDL-RMZ-01, 08 through 13 (also see wildlife connectivity section below)	FW-SUIT-RMZ-01; MA3b-Special Area-SUIT-01, 02 (Fatty Creek Cedars), MA4a-SUIT-01 (Le Beau, Swan River RNAs)	MON-TE&V-01; MON- WL-03; MON-WL-17
Most wildlife species associated with cliffs, rocks, caves	FW-DC-CAVES-01 through 05; MA4a-DC-02, 03 (Little Bitterroot, Tuchuck)		FW-GDL-CAVES-01 through 03, FW-GDL-WL DIV-01	FW-SUIT-RMZ-01;	MON- WL-06
Most wildlife species associated with coniferous forest in a variety of successional stages	FW-DC-RMZ-05, FW-DC-TE&V-02, 03, 18, 19 (also see old growth, grass/forb/shrub, and burned forest above)	FW-OBJ-TE&V-01, 03, 04	(also see old growth, grass/forb/shrub, and burned forest above)	MA1a-SUIT-02, MA1b-SUIT-02, MA2a-SUIT-01, MA3a-SUIT-01, MA4a-SUIT-01, MA4b-SUIT-01, MA5-SUIT-01, MA6-SUIT-01	MON-TE&V-01 through 05
Clark's nutcracker (SCC)	FW-DC-TE&V-03, 07, 08,12 (cold type); FW-DC-PLANT-03, 04; FW-DC-WL DIV-01 Tuchuck Research Natural Area MA 4a-DC-01, 02, 03	FW-OBJ-PLANT-01	FW-STD-TE&V-02	MA1b-SUIT-03; MA4a –SUIT-01 (Tuchuck RNA)	MON-PLANT-02, 03; MON-TE&V-01; MON- WL-05:
Flammulated owl (SCC)	FW-DC-WL DIV-01; FW-DC-TE&V-08, 11,12,13, 14; FW-DC-FIRE-03, 04; FW-DC-TIMB-03, 06	FW-OBJ-TE&V-01	GA-SV-STD-01; GA-SM-STD-02; FW-STD-TE&V-01 and 03; FW-GDL-TE&V-06, 07, 09; timber FW-GDL-TIMB-01 through 03	MA6a,b,c-SUIT-01	MON-TE&V-01: MON- WL-02; MON-WL-15
Ungulates/big game	FW-DC-TE&V-08 through 11, 13, 18, 18, 22 through 25; FW-DC-FIRE-03, 04; FW-DC-REC WL-03; FW-DC-TIMB-03, 06; MA5-DC-02; MA6a, 6b, and 6c-DC-02; GA-HH-DC-02; GA-NF-DC-08; GA-SM-DC-04, 05, 06; GA-SF-DC-04; GA-SV-DC-03, 05, 07	FW-OBJ-TE&V-01, 04	FW-GDL-WL DIV-01, 04, 05, 06; FW-GDL-RMZ-09, 12 through 15; FW-STD-IFS-02; GA-SM-GDL-01; GA-SM-STD-01	MA1a-SUIT-02, MA1b-SUIT-02, MA2a-SUIT-01, MA3a-SUIT-01, MA4a-SUIT-01, MA4b-SUIT-01, MA5-SUIT-01, MA6-SUIT-01	MON-NCDE-01, 07; MON-TE&V-01; MON-WL-09

Species	Desired Conditions	Objectives	Standards and Guideline	Suitability	Monitoring
Wildlife connectivity	FW-DC-WTR-02, FW-DC-RMZ-06; FW-DC-TE&V-19; FW-DC-WL DIV-01, appendix A: ALL 01, LINK 01; FW-DC-LSU-01; FW-DC-P&C-01; GA-HH-DC-03; GA-MF-DC-04; GA-NF-DC-06 and 07; GA-SM-DC-01, 03; GA-SV-DC-09; MA6a,b, and c-DC-02	GA-MF-OBJ-01, GA-NF-OBJ-03, GA-SM-OBJ-04, GA-SV-OBJ-04, FW-OBJ-IFS-01	FW-STD-RMZ-01,05, 06, FW-GDL-RMZ-01, 08 through 15; FW-STD-IFS-02, FW-GDL-IFS-12, FW-STD-TE&V-01, 03, FW-GDL-TE&V-03, 06 through 09; FW-GDL-WL DIV-06; FW-STD-E&M-03 and 07; appendix A—ALL S1, ALL G1, LINK S1, LINK G1, G2; GA-SM-STD-01	FW-SUIT-RMZ-01; see revised forest plan table 34	MON-NCDE-01, 07; MON-TE&V-01; MON-WL-09, MON-WL-04

Key Ecosystem Characteristics and Stressors for Species of Conservation Concern

Table 6-2 shows how key ecosystem characteristics and stressors for species of conservation concern are addressed by coarse-filter and species-specific plan components. Some plan components deal with stressors or threats relevant to populations in the plan area, and some deal with the ecological conditions or key ecosystem characteristics required by the species. Plan components may apply at the forestwide scale (FW), the geographic area scale (GA), or the management area (MA) scale. The lists in Table 6-2 are not intended to be all inclusive for all stressors or all plan components (for more details see the final EIS, chapter 3; see final EIS appendices 2 and 7 for stressors and strategies related to a changing climate).

Table 6-2. Summary of how plan components address stressors, key ecosystem characteristics, and ecological conditions for species of conservation concern (SCC)

Regional forester SCC species 2017	Key ecosystem characteristics or ecological conditions	Stressors	How stressors are addressed by coarse filter plan components in the selected alternative	How stressors are addressed by species-specific plan components in the selected alternative
Black swift	<ul style="list-style-type: none"> Tall cliffs and waterfalls for nesting. Rivers, lakes, and meadows for feeding on insects over water. Levels of human disturbance at nesting colony sites that do not disrupt nesting. This bird species is highly mobile with no known needs for a 	<p>Annual reproduction may be affected by drought and corresponding low water runoff, although the swift has undoubtedly evolved with periods of drought. Rivers with feeding observations are large and feeding is not likely to be impacted by drought.</p> <p>Human disturbance could affect annual reproduction, although typically this species nests behind waterfalls well above ground level, which</p>	Waterfall with known nest colony is in recommended wilderness MA1b	Desired condition FW-DC-WL-DIV-01 addresses key ecosystem characteristics for the black swift. Guideline FW-GDL-WL-DIV-05 limits the risk of human disturbance because it specifies that new projects or authorizations for activities known to disturb black swifts should not occur within 500 feet of active black swift nest sites from April 15 to August 15 unless project design features mitigate disturbance to nesting black swifts.

Regional forester SCC species 2017	Key ecosystem characteristics or ecological conditions	Stressors	How stressors are addressed by coarse filter plan components in the selected alternative	How stressors are addressed by species-specific plan components in the selected alternative
	particular type of connectivity.	likely affords protection in most cases (Wiggins, 2004).		
Clark's nutcracker	<p>In high-elevation conifer forests found in the cold potential vegetation type:</p> <ul style="list-style-type: none"> live, seed-producing whitebark pine to provide sufficient food to support nesting. In low-elevation conifer forests found in the warm-dry and warm-moist potential vegetation type: seed-producing ponderosa pine for winter feeding. <p>This bird species is highly mobile with no known needs for a particular type of connectivity.</p>	<p>Loss of cone-producing whitebark and ponderosa pines to disease, insect outbreaks, and fire may lead to local and widespread declines in nutcracker abundance ((Tomback, 1998) (Diana Tomback, University of Colorado, pers. comm. with C. Staab). Restoration of whitebark pine may take many years (decades to centuries) (Keane et al., 2012). Nutcrackers are known to emigrate when cone crops are small (Schaming, 2015).</p>	<p>Plan components FW-DC-PLANT-03, 04 and FW-OBJ-PLANT-01 would promote the restoration of mature, seed-producing whitebark pine, a key ecosystem characteristic for the Clark's nutcracker.</p>	<p>Desired condition FW-DC-WL-DIV -01 addresses key ecosystem characteristics for the Clark's nutcracker.</p>
Flammulated Owl	<p>In dry ponderosa pine/Douglas-fir forests:</p> <ul style="list-style-type: none"> a mosaic of (1) large and very large snags for nesting, (2) open midstory, (3) patches of dense Douglas-fir and ponderosa pine seedlings/saplings, (4) small openings for foraging, (5) in a landscape with an abundance of dry ponderosa pine/Douglas-fir forest. 	<p>Stand-replacing fire and suppression of mixed-severity fires can both reduce the amount of open mature ponderosa pine habitat used by this species. Past harvest of large ponderosa pine and the loss of large pine snags harvested along open roads also may have contributed to historic habitat loss.</p>	<p>Because flammulated owl habitat occurs in the wildland-urban interface, FW-OBJ-TE&V-01 would be the primary objective to restore the stand structure that provides key ecosystem characteristics for the flammulated owl in the warm-dry and warm-moist potential vegetation types. Plan components protect existing old-growth ponderosa pine/Douglas-fir forest, promote development and larger patch sizes of future old growth, and provide for retention of large and very large snags and defective live trees (see standards FW-STD-TE&V-01 and 03, FW-GDL-TE&V-06 and 09). Minimum snag density requirements meet the needs of pileated woodpeckers and flickers, which create nest cavities used by flammulated</p>	<p>Desired condition FW-DC-WL-DIV-01 addresses key ecosystem characteristics for the flammulated owl.</p>

Regional forester SCC species 2017	Key ecosystem characteristics or ecological conditions	Stressors	How stressors are addressed by coarse filter plan components in the selected alternative	How stressors are addressed by species-specific plan components in the selected alternative
	This bird species is highly mobile with no known needs for a particular type of connectivity.		owls. Flammulated owl habitat occurs in the Swan Valley and Salish Mountain geographic areas. Standards GA-SV-STD-01 and GA-SM-STD-02 for the Swan Valley and Salish Mountain geographic areas benefit flammulated owls by retaining key trees for nesting habitat. Road access standards and objectives (FW-STD-IFS-02, GA-SM-STD-01, GA-SV-OBJ-04) could indirectly help to retain very large ponderosa pine snags with a potential to be used by flammulated owls for nesting if road closures occur in suitable habitat. Temporary public access for firewood gathering allowed under FW-STD-IFS-02 could result in snag loss, but guideline FW-GDL-OFP-01 would help to retain snags that are highly suitable for use by flammulated owls.	
SCC plant species— Peatland/Fen habitat group	Wet to moist soils in or in the ecotone areas adjacent to peatlands, fens, and sometimes seepy areas or other types of wetlands.	Human activities that could change the hydrology of the groundwater-dependent fen and wetland habitats or directly disturb vegetation and soils in or adjacent to these habitats.	Desired condition to provide ecological conditions that sustain plant SCC (FW-DC-PLANT DIV-01). Riparian management zones established around all wetland features (FW-RMZ-STD-01), with a 300-foot minimum width for fens and peatlands. Desired conditions for riparian management zones address ecological conditions that would maintain native plant communities, which would also create conditions beneficial for SCC species within these plant communities. Riparian management zone standards and guidelines control the type, method, and extent of management actions that could occur. Soils standards and guidelines (FW-STD-SOIL-01, FW-GDL-SOIL-01, 02, 03) that protect soils and limit the amount of disturbance allowed when conducting management	Guidelines FW-GDL-PLANT DIV-01 and 02 prohibit locating temporary fire facilities and using heavy ground-based equipment in areas of known plant SCC. Plan components related to water howellia, as well as following the direction in the conservation strategy for howellia, will also benefit and protect other plant species that may occur in or adjacent to (i.e., within 300 feet of) howellia ponds (FW-GDL-PLANT-01, 02, and 03).

Regional forester SCC species 2017	Key ecosystem characteristics or ecological conditions	Stressors	How stressors are addressed by coarse filter plan components in the selected alternative	How stressors are addressed by species-specific plan components in the selected alternative
			activities, which will protect the plant communities as well. Special areas (management area 3b) identified around some fens, with associated plan direction to maintain ecological conditions and protect these areas from invasive plants and human disturbances (MA 3b-Special Area-DC-01, 02).	
SCC plant species— Wetland/Riparian habitat group	Swamps, marshes, riparian seeps and springs, stream banks.	Human activities that could change the hydrology of groundwater-dependent wetland habitats or directly disturb vegetation and soils in riparian areas. Also, removal of forest canopy cover adjacent to occupied habitat may pose a threat. Non-native species may be a threat.	Desired condition to provide ecological conditions that sustain plant SCC (FW-DC-PLANT DIV-01). Riparian management zones established around all wetland features (FW-RMZ-STD-01), ranging from 100- to 300-foot width, depending on size of wetland. Desired conditions for riparian management zones address ecological conditions that would maintain plant communities, which will also create conditions beneficial for SCC species within these plant communities. Riparian management zone standards and guidelines control the type, method, and extent of management actions that could occur, protecting SCC plants. Soils standards and guidelines (FW-STD-SOIL-01, FW-GDL-SOIL-01, 02, 03) that protect soils and limit the amount of disturbance allowed when conducting management activities, which will protect the plant communities as well.	Guidelines FW-GDL-PLANT DIV-01 and 02 prohibit locating temporary fire facilities and using heavy ground-based equipment in areas of known plant SCC.
SCC plant species— Upland habitat group (mesic montane, rock/talus/ scree, and disturbance- associated)	Occur in a wide range of ecological conditions, from non-forest or hardwood-dominated areas (mesic meadows, grasslands, talus/rock/cliff areas, cottonwood forest types); warm-moist to wet forests (western red	Activities that disturb vegetation or soils in their habitats, such as grazing, trampling, off-road vehicle use, road construction, timber harvesting, recreational activities (such as camping).	Desired condition to provide ecological conditions that sustain plant SCC (FW-DC-PLANT DIV-01). Soils standards and guidelines (FW-STD-SOIL-01, FW-GDL-SOIL-01, 02, 03) that protect soils and limit the amount of disturbance allowed when conducting	Guidelines FW-GDL-PLANT DIV-01 and 02 prohibit locating temporary fire facilities and using heavy ground-based equipment in areas of known plant SCC.

Regional forester SCC species 2017	Key ecosystem characteristics or ecological conditions	Stressors	How stressors are addressed by coarse filter plan components in the selected alternative	How stressors are addressed by species-specific plan components in the selected alternative
	cedar types, forest margins adjacent to wetlands); warm-dry forests (dry Douglas-fir/mixed conifer types). Some occur in lightly disturbed areas or on open soil, such as roadsides or grazed pastures.	Fire exclusion/changes in fire regimes, and resulting changes in vegetation succession, may be an issue for species associated with non-forest, open, or disturbed habitats. Non-native plant species are a threat where the SCC species occur.	management activities, which will protect the plant communities as well. Priority given to areas with known plant SCC species when treating non-native plant species (FW-DC-NNIP-01, 02; FW-OBJ-NNIP-01).	

Species Lists and Habitat Associations

The following tables list wildlife, plant, fish, and aquatic and terrestrial invertebrate species on the Flathead National Forest and their association with the habitats and the potential vegetation types on the Forest. These potential vegetation types are used as the basis for many forest plan components related to vegetation and wildlife habitat. Refer to appendix D of the revised forest plan for a summary of the plant communities that are within the potential vegetation type categories.

Species status is provided in some tables. This status includes the Montana Natural Heritage Program statewide ranking; species previously identified as sensitive for the state of Montana and known or suspected to occur on the Flathead National Forest; species listed by the USFWS under the Endangered Species Act; and species of conservation concern designated by the regional forester for the final environmental impact statement. Neotropical migratory species are also identified.

Wildlife species, species status, and habitat associations for the Flathead National Forest

Table 6-3. Wildlife species, species status, and habitat associations for the Flathead National Forest

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Acanthis flammea</i> Common Redpoll	G5/S5N	X							X	X	
<i>Acanthis hornemanni</i> ⁵ Hoary Redpoll	G5/SNA	X								X	
<i>Accipiter cooperii</i> Cooper's Hawk	G5/S4B	X						X	X	X	X
<i>Accipiter gentilis</i> Northern Goshawk	G5/S3	X	X	X					X	X	X
<i>Accipiter striatus</i> Sharp-Shinned Hawk	G5/S4B	X							X	X	X
<i>Actitis macularius</i> Spotted Sandpiper	G5/S5B	X						X	X	X	
<i>Aechmophorus occidentalis</i> Western Grebe	G5/S4B							X			

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Aegolius acadicus</i> Northern Saw-whet Owl	G5/S4	X		X					X	X	X
<i>Aegolius funereus</i> Boreal Owl	G5/S3S4		X	X						X	X
<i>Aeronautes saxatalis</i> White-Throated Swift	G5/S5B				Alpine, bedrock, and scree		X				X
<i>Agelaius phoeniceus</i> Red-Winged Blackbird	G5/S5B	X					X	X			
<i>Aix sponsa</i> Wood Duck	G5/S5B			X		X		X			
<i>Alces americanus</i> Moose	G5/S4				Burned forest	X		X	X	X	
<i>Ambystoma macrodactylum</i> Long-Toed Salamander	G5/S4							X	X	X	X
<i>Ambystoma mavortium</i> Tiger Salamander	G5/S4	X						X			
<i>Ammodramus savannarum</i> Grasshopper Sparrow	G5/S4B	X					X		X	X	
<i>Anas acuta</i> Northern Pintail	G5/S5B	X				X		X			
<i>Anas americana</i> American Wigeon	G5/S5B					X		X			

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Anas clypeata</i> Northern Shoveler	G5/S5B	X				X		X			
<i>Anas crecca</i> Green-Winged Teal	G5/S5B					X		X			
<i>Anas cyanoptera</i> Cinnamon Teal	G5/S5B					X		X			
<i>Anas discors</i> Blue-Winged Teal	G5/S5B					X		X			
<i>Anas penelope</i> ⁵ Eurasian Wigeon	G5/SNA					X		X	X		
<i>Anas strepera</i> Gadwall	G5/S5B					X		X			
<i>Anaxyrus boreas</i> Boreal (Western) Toad	G4/S2, on sensitive species list for Flathead National Forest and adjacent Forests			X	Burned forest			X	X	X	X
<i>Anthus rubescens</i> American Pipit	G5/S4B				Alpine			X	X		
<i>Aquila chrysaetos</i> Golden Eagle	G5/S3	X								X	X
<i>Archilochus alexandri</i> Black-Chinned Hummingbird	G5/S4B	X					X	X	X		

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Ardea herodias</i> Great Blue Heron	G5/S3	X						X	X	X	
<i>Ascaphus montanus</i> Tailed Frog	G4/S4		X	X	Cold, swift water			X			
<i>Asio flammeus</i> Short-Eared Owl	G5/S4	X							X		
<i>Aythya affinis</i> Lesser Scaup	G5/S5B					X		X			
<i>Aythya americana</i> Redhead	G5/S5B					X		X			
<i>Aythya collaris</i> Ring-Necked Duck	G5/S5B					X		X			
<i>Aythya marila</i> Greater Scaup	G5/SU					X		X			
<i>Aythya valisineria</i> Canvasback	G5/S5B					X		X			
<i>Bombycilla cedrorum</i> Cedar Waxwing	G5/S5B	X					X	X	X	X	X
<i>Bombycilla garrulus</i> Bohemian Waxwing	G5/S5N	X							X		X
<i>Bonasa umbellus</i> Ruffed Grouse	G5/S4	X		X		X		X	X	X	
<i>Botaurus lentiginosus</i> American Bittern	G4/S3B							X	X		

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Branta canadensis</i> Canada Goose	G5/S5B	X				X		X	X		
<i>Bubo scandiacus</i> ⁵ Snowy Owl	G5/SNA	X							X	X	
<i>Bubo virginianus</i> Great Horned Owl	G5/S5	X		X				X	X	X	X
<i>Bucephala albeola</i> Bufflehead	G5/S5B			X		X		X			
<i>Bucephala clangula</i> Common Goldeneye	G5/S5			X		X		X			
<i>Bucephala islandica</i> Barrow's Goldeneye	G5/S4			X		X		X		X	
<i>Buteo jamaicensis</i> Red-Tailed Hawk	G5/S5B	X							X	X	X
<i>Buteo lagopus</i> Rough-Legged Hawk	G5/S5N	X								X	X
<i>Buteo swainsoni</i> Swainson's Hawk	G5/S4B	X							X	X	
<i>Calidris alba</i> ⁵ Sanderling	G5/SNA	X						X			
<i>Calidris pusilla</i> ⁵ Semipalmated Plover	G5/SNA	X						X			

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Callospermophilus lateralis</i> Golden-Mantled Ground Squirrel	G5/S4				Krummholz						X
<i>Canis latrans</i> Coyote	G5/S5	X				X ⁶			X	X	
<i>Canis lupus</i> Gray Wolf	G4/S4, on regional forester's sensitive species list for Flathead National Forest and adjacent Forests	X				X		X	X	X	X
<i>Cardellina pusilla</i> Wilson's Warbler	G5/S5B	X					X	X	X		X
<i>Castor canadensis</i> Beaver	G5/S5	X				X		X	X	X	
<i>Cathartes aura</i> Turkey Vulture	G5/S4B	X			Cliffs		X		X	X	
<i>Catharus fuscescens</i> Veery	G5/S3B	X					X	X	X	X	
<i>Catharus guttatus</i> Hermit Thrush	G5/S5B		X				X		X	X	X
<i>Catharus ustulatus</i> Swainson's Thrush	G5/S5B	X	X				X		X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Catherpes mexicanus</i> Canyon Wren	G5/S4									X	
<i>Certhia americana</i> Brown Creeper	G5/S3		X	X					X	X	
<i>Cervus canadensis</i> Elk	G5/S5	X			Burned forest	X			X	X	X
<i>Chaetura vauxi</i> Vaux's Swift	G5/S4B		X	X			X	X	X	X	
<i>Charadrius vociferus</i> Killdeer	G5/S5B	X						X	X		X
<i>Charina bottae</i> Rubber Boa	G5/S4							X	X	X	
<i>Chen caerulescens</i> Snow Goose	G5/S4N	X				X		X			
<i>Chlidonias niger</i> Black Tern	G4/S3B							X	X		
<i>Chordeiles minor</i> Common Nighthawk	G5/S5B	X					X		X		
<i>Chrysemys picta</i> Painted Turtle	G5/S4	X						X	X	X	
<i>Cinclus mexicanus</i> American Dipper	G5/S5							X			
<i>Circus cyaneus</i> Northern Harrier	G5/S4B	X						X	X	X	X
<i>Cistothorus palustris</i> Marsh Wren	G5/S5B	X						X	X		

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Coccothraustes vespertinus</i> Evening Grosbeak	G5/S3	X							X	X	X
<i>Colaptes auratus</i> Northern Flicker	G5/S5	X		X				X	X	X	X
<i>Columba livia</i> ⁵ Rock Pigeon	G5/SNA	X			Cliffs, buildings				X		
<i>Contopus cooperi</i> Olive-Sided Flycatcher	G4/S4B	X		X	Burned forest		X		X	X	X
<i>Contopus sordidulus</i> Western Wood-Pewee	G5/S5B	X					X	X	X		
<i>Corvus brachyrhynchos</i> American Crow	G5/S5B								X	X	X
<i>Corvus corax</i> Common Raven	G5/S5	X							X		X
<i>Corynorhinus townsendii</i> Townsend's Big-Eared Bat	G3G4, on regional forester's sensitive species list for Flathead National Forest and adjacent Forests	X		X	Caves			X	X		
<i>Molothrus ater</i> Brown-Headed Cowbird	G5/S5B	X					X	X	X	X	

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Cyanocitta cristata</i> Blue Jay	G5/S5							X	X		X
<i>Cyanocitta stelleri</i> Steller's Jay	G5/S5	X							X	X	X
<i>Cygnus buccinator</i> Trumpeter Swan	G4/S3	X						X	X		
<i>Cygnus columbianus</i> ⁵ Tundra Swan	G5/SNA	X						X	X		
<i>Cypseloides niger</i> Black Swift	G4/S1B, Flathead National Forest SCC				Waterfalls		X	X	X	X	X
<i>Dendragapus obscurus</i> Dusky Grouse	G5/S4	X				X			X	X	X
<i>Dolichonyx oryzivorus</i> ⁴ Bobolink	G5/S3B	X					X	X	X		
<i>Dryocopus pileatus</i> Pileated Woodpecker	G5/S3		X	X				X	X	X	X
<i>Dumetella carolinensis</i> Gray Catbird	G5/S5B	X					X	X	X	X	
<i>Elgaria coerulea</i> Northern Alligator Lizard	G5/S3				Rock				X		
<i>Empidonax hammondi</i> Hammond's Flycatcher	G5/S4B	X	X				X		X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Empidonax minimus</i> Least Flycatcher	G5/S5B	X					X	X	X	X	
<i>Empidonax oberholseri</i> Dusky Flycatcher	G5/S5B	X			Burned forest		X		X	X	
<i>Empidonax occidentalis</i> Cordilleran Flycatcher	G5/S4B	X			Cliffs		X		X	X	
<i>Empidonax traillii</i> Willow Flycatcher	G5/S4B	X					X	X	X		X
<i>Eptesicus fuscus</i> Big Brown Bat	G5/S4			X	Caves			X	X	X	
<i>Eremophila alpestris</i> Horned Lark	G5/S5	X								X	X
<i>Euphagus cyanocephalus</i> Brewer's Blackbird	G5/S5B	X					X	X	X		X
<i>Falcapennis canadensis</i> Spruce Grouse	G5/S4		X			X				X	
<i>Falco columbarius</i> Merlin	G5/S4	X					X		X		
<i>Falco mexicanus</i> Prairie Falcon	G5/S4	X					X		X		X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Falco peregrinus</i> Peregrine Falcon	G4/S3, on regional forester's sensitive species list for Flathead National Forest and adjacent Forests	X			Cliffs		X	X	X	X	X
<i>Falco sparverius</i> American Kestrel	G5/S5	X		X			X		X		X
<i>Fulica americana</i> American Coot	G5/S5B					X		X			
<i>Gallinago delicata</i> Wilson's Snipe	G5/S5	X				X		X	X		
<i>Gavia immer</i> Common Loon	G5/3B, On regional forester's sensitive species list for Flathead National Forest and adjacent Forests							X			
<i>Geothlypis tolmiei</i> MacGillivray's Warbler	G5/S5B	X					X	X	X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Geothlypis trichas</i> Common Yellowthroat	G5/S5B	X					X	X	X	X	X
<i>Glaucidium gnoma</i> Northern Pygmy-Owl	G4G5/S4	X		X					X	X	X
<i>Glaucomys sabrinus</i> Northern Flying Squirrel	G5/S4		X	X				X	X	X	
<i>Grus canadensis</i> Sandhill Crane	G5/ S5BS2N	X						X	X	X	
<i>Gulo gulo luscus</i> Wolverine	G4/S3, USFWS Proposed Species; Sensitive on Flathead National Forest and adjacent Forests				Persistent snow	Trapping currently on hold			X	X	X
<i>Haemorhous cassinii</i> Cassin's Finch	G5/S3	X			Burned forest				X	X	X
<i>Haemorhous mexicanus</i> House Finch	G5/S5	X							X	X	

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Haliaeetus leucocephalus</i> Bald Eagle	G5/S4, sensitive on Flathead National Forest and adjacent Forests	X	X	X				X	X	X	X
<i>Hirundo rustica</i> Barn Swallow	G5/S5B	X					X	X	X	X	
<i>Histrionicus histrionicus</i> Harlequin Duck	G4/S2B, Sensitive on Flathead National Forest and adjacent Forests		X	X	Cold, swift water	X		X		X	
<i>Icterus bullockii</i> ⁴ Bullock's Oriole	G5/S5B	X					X	X	X	X	
<i>Ixoreus naevius</i> Varied Thrush	G5/S3B		X						X	X	X
<i>Junco hyemalis</i> Dark-Eyed Junco	G5/S5B	X							X	X	X
<i>Lagopus leucura</i> White-Tailed Ptarmigan	G5/S3	X			Alpine, krummholz, persistent snow						X
<i>Lanius excubitor</i> Northern Shrike	G5/S5N	X							X	X	
<i>Larus californicus</i> California Gull	G5/S5B	X						X	X	X	
<i>Larus delawarensis</i> Ring-Billed Gull	G5/S5B	X						X		X	

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Lasionycteris noctivagans</i> Silver-Haired Bat	G5/S4	X	X	X	Caves			X	X	X	
<i>Lasiurus cinereus</i> Hoary Bat	G5/S3	X			Caves			X	X	X	
<i>Lepus americanus</i> Snowshoe Hare	G5/S4	X						X	X	X	
<i>Leucosticte tephrocotis</i> Gray-Crowned Rosy-Finch	G5/ S2BS5N	X			Persistent snow					X	X
<i>Limnodromus scolopaceus</i> ⁵ Long-Billed Dowitcher	G5/SNA	X						X			
<i>Lithobates catesbeianus</i> Bullfrog	G5							X			
<i>Lithobates pipiens</i> ⁴ Northern Leopard Frog	G5/S1S4, Sensitive on Flathead National Forest and adjacent Forests	X						X	X		
<i>Lontra canadensis</i> Northern River Otter	G5/S4					X		X	X	X	
<i>Lophodytes cucullatus</i> Hooded Merganser	G5/S4			X		X		X			

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Loxia curvirostra</i> Red Crossbill	G5/S5									X	X
<i>Loxia leucoptera</i> White-Winged Crossbill	G5/S4								X		X
<i>Lynx canadensis</i> Canada Lynx	G5/S3, Threatened		X	X					X (warm-moist only)	X	X
<i>Lynx rufus</i> Bobcat	G5/S5	X		X		X		X	X	X	
<i>Marmota caligata</i> Hoary Marmot	G5/S3S4	X			Alpine boulder fields					X	X
<i>Marmota flaviventris</i> Yellow-Bellied Marmot	G5/S4								X		
<i>Martes americana</i> Marten	G5/S4		X	X		X			X	X	X
<i>Megaceryle alcyon</i> Belted Kingfisher	G5/S5B	X					X	X	X	X	X
<i>Megascops kennicottii</i> Western Screech-Owl	G5/S3S4	X		X				X	X	X	
<i>Melanerpes lewis</i> Lewis's Woodpecker	G4/S2B			X	Burned forest			X	X		
<i>Meleagris gallopavo</i> ⁵ Wild Turkey	G5/SNA	X				X		X	X		

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Melospiza lincolnii</i> Lincoln's Sparrow	G5/S5B	X					X	X	X	X	
<i>Melospiza melodia</i> Song Sparrow	G5/S5B	X						X	X	X	X
<i>Mephitis mephitis</i> Striped Skunk	G5/S5	X						X	X		
<i>Mergus merganser</i> Common Merganser	G5/S5B			X		X		X			
<i>Mergus serrator</i> ⁵ Red-Breasted Merganser	G5/SNA					X		X			
<i>Microtus longicaudus</i> Long-Tailed Vole	G5/S4							X	X	X	
<i>Microtus montanus</i> Montane Vole	G5/S5							X	X	X	
<i>Microtus pennsylvanicus</i> Meadow Vole	G5/S5	X						X	X	X	
<i>Microtus richardsoni</i> Water Vole	G5/S4							X	X	X	
<i>Mustela erminea</i> Short-Tailed Weasel	G5/S5	X				X		X	X	X	
<i>Mustela frenata</i> Long-Tailed Weasel	G5/S5	X				X		X	X	X	

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Mustela nivalis</i> Least Weasel	G5/S4					X			X		
<i>Mustela vison</i> Mink (American)	G5/S5	X				X		X			
<i>Myadestes townsendi</i> Townsend's Solitaire	G5/S5	X			Burned forest				X	X	X
<i>Myodes gapperi</i> Southern Red-Backed Vole	G5/S4		X	X				X	X	X	X
<i>Myotis californicus</i> California Myotis	G5/S4				Caves			X	X	X	
<i>Myotis ciliolabrum</i> Western Small-Footed Myotis	G5/S4				Caves			X	X	X	
<i>Myotis evotis</i> Long-Eared Myotis	G5/S4			X	Caves			X		X	
<i>Myotis lucifugus</i> Little Brown Myotis	G3/S4			X				X	X	X	
<i>Myotis volans</i> Long-Legged Myotis	G5/S4			X	Caves					X	
<i>Myotis yumanensis</i> Yuma Myotis	G5/S3S4			X				X			
<i>Neotoma cinerea</i> Bushy-Tailed Woodrat	G5/S5			X	Caves, cliffs				X	X	

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Nucifraga columbiana</i> Clark's Nutcracker	G5/S3, Flathead National Forest SCC				Whitebark pine				X	X	X
<i>Numenius americanus</i> Long-Billed Curlew	G5/S3B	X						X			
<i>Ochotona princeps</i> Pika	G5/S4	X			Alpine talus, boulder fields					X	X
<i>Odocoileus hemionus</i> Mule Deer	G5/5	X				X			X	X	X
<i>Odocoileus virginianus</i> White-Tailed Deer	G5/S5	X				X		X	X	X	
<i>Ondatra zibethicus</i> Muskrat	G5/S5	X				X		X	X		
<i>Oreamnos americanus</i> Mountain Goat	G5/S4	X			Cliffs	X				X	X
<i>Oreothlypis celata</i> Orange-Crowned Warbler	G5/S5B	X					X		X	X	X
<i>Oreothlypis peregrina</i> Tennessee Warbler	G5/S3S4B						X	X		X	

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Oreothlypis ruficapilla</i> Nashville Warbler	G5/S5B	X					X		X	X	
<i>Otus flammeolus</i> Flammulated Owl	G5/S3B, Flathead National Forest SCC, Sensitive on Flathead National Forest and adjacent Forests	X	X	X			X		X		
<i>Ovis canadensis</i> ⁷ Bighorn Sheep	G4/S4, sensitive on Flathead National Forest and adjacent Forests	X			Cliffs	X					X
<i>Oxyura jamaicensis</i> Ruddy Duck	G5/S5B					X		X			
<i>Pandion haliaetus</i> Osprey	G5/S5B	X		X			X	X	X	X	X
<i>Parkesia noveboracensis</i> Northern Waterthrush	G5/S5B	X					X	X		X	
<i>Passer domesticus</i> ⁵ House Sparrow	G5/SNA	X		X		X ⁶			X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Passerculus sandwichensis</i> Savannah Sparrow	G5/S5B	X					X		X	X	
<i>Passerella iliaca</i> Fox Sparrow	G5/S5B	X						X	X	X	X
<i>Passerina amoena</i> Lazuli Bunting	G5/S4B	X					X	X	X	X	
<i>Patagioenas fasciata</i> ⁵ Band-Tailed Pigeon	G4/SNA								X		
<i>Pekania pennanti</i> Fisher ⁸	G5/S3, Sensitive on Flathead National Forest and adjacent Forests		X	X		X			X	X	
<i>Perisoreus canadensis</i> Gray Jay	G5/S5								X	X	X
<i>Peromyscus maniculatus</i> Deer Mouse	G5/S5	X						X	X	X	X
<i>Petrochelidon pyrrhonota</i> Cliff Swallow	G5/S5B	X			Cliffs		X	X	X		X
<i>Phalacrocorax auritus</i> Double-Crested Cormorant	G5/S5B							X		X	

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Phalaropus tricolor</i> Wilson's Phalarope	G5/S4B	X						X			
<i>Phenacomys intermedius</i> Heather Vole	G5/S4							X	X	X	
<i>Pheucticus ludovicianus</i> ⁵ Rose-Breasted Grosbeak	G5/SNA						X	X		X	
<i>Pheucticus melanocephalus</i> Black-Headed Grosbeak	G5/S5B	X					X	X	X		X
<i>Pica hudsonia</i> Black-Billed Magpie	G5/S5	X							X	X	
<i>Picoides arcticus</i> Black-Backed Woodpecker	G5/S3, Sensitive on Flathead National Forest and adjacent Forests			X	Burned forest				X	X	X
<i>Picoides dorsalis</i> American Three-Toed Woodpecker	G5/S4		X	X	Burned forest				X	X	X
<i>Picoides pubescens</i> Downy Woodpecker	G5/S5			X				X	X	X	X
<i>Picoides villosus</i> Hairy Woodpecker	G5/S5		X	X	Burned forest				X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Pinicola enucleator</i> Pine Grosbeak	G5/S5	X	X						X	X	X
<i>Pipilo maculatus</i> Spotted Towhee	G5/S5B	X						X		X	
<i>Piranga ludoviciana</i> Western Tanager	G5/S5B	X					X		X	X	X
<i>Pituophis catenifer</i> Gopher Snake	G5/S5	X							X		
<i>Anas platyrhynchos</i> Mallard	G5/S5					X		X			
<i>Plectrophenax nivalis</i> Snow Bunting	G5/S5N	X							X	X	
<i>Podiceps auritus</i> Horned Grebe	G5/S3B							X			
<i>Podiceps grisegena</i> Red-Necked Grebe	G5/S4B							X			
<i>Podiceps nigricollis</i> Eared Grebe	G5/S5B							X			
<i>Podilymbus podiceps</i> Pied-Billed Grebe	G5/S5B							X			
<i>Poecile atricapillus</i> Black-Capped Chickadee	G5/S5	X		X				X	X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Poecile gambeli</i> Mountain Chickadee	G5/S5			X					X	X	X
<i>Poecile hudsonicus</i> Boreal Chickadee	G5/S3		X	X						X	X
<i>Poecile rufescens</i> Chestnut-Backed Chickadee	G5/S4		X	X					X	X	X
<i>Poocetes gramineus</i> Vesper Sparrow	G5/S5B	X					X		X	X	
<i>Porzana carolina</i> Sora	G5/S5B	X						X			
<i>Procyon lotor</i> Raccoon	G5/S5	X		X		X ⁶		X	X		
<i>Pseudacris regilla</i> Pacific Treefrog	G5/S4	X						X	X	X	
<i>Puma concolor</i> Mountain Lion	G5/S4	X				X			X	X	X
<i>Quiscalus quiscula</i> ⁴ Common Grackle	G5/S5B	X						X	X		
<i>Rallus limicola</i> ⁴ Virginia Rail	G5/S5B							X	X		
<i>Rana luteiventris</i> Columbia Spotted Frog	G4/S4	X						X	X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Rangifer tarandus caribou</i> ⁵ Woodland Caribou	G5T4/SX		X							X	
<i>Recurvirostra americana</i> American Avocet	G5/S4B							X	X		
<i>Regulus calendula</i> Ruby-Crowned Kinglet	G5/S5B						X		X	X	X
<i>Regulus satrapa</i> Golden-crowned Kinglet	G5/S5		X						X	X	X
<i>Riparia riparia</i> Bank Swallow	G5/S5B	X					X	X	X	X	X
<i>Sayornis saya</i> Say's Phoebe	G5/S5B	X					X			X	
<i>Selasphorus calliope</i> Calliope Hummingbird	G5/S5B	X					X	X	X	X	X
<i>Selasphorus rufus</i> Rufous Hummingbird	G5/S4B	X					X	X	X	X	X
<i>Setophaga coronata</i> Yellow-Rumped Warbler	G5/S5B	X							X		X
<i>Setophaga petechia</i> Yellow Warbler	G5/S5B	X					X	X	X		

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Setophaga ruticilla</i> American Redstart	G5/S5B	X					X	X	X	X	
<i>Setophaga townsendi</i> Townsend's Warbler	G5/S5B		X				X		X	X	X
<i>Sialia currucoides</i> Mountain Bluebird	G5/S5B	X		X	Burned forest				X		X
<i>Sialia mexicana</i> Western Bluebird	G5/S4B	X		X					X	X	
<i>Sitta canadensis</i> Red-Breasted Nuthatch	G5/S5		X	X					X	X	X
<i>Sitta carolinensis</i> White-Breasted Nuthatch	G5/S4		X	X				X	X		X
<i>Sitta pygmaea</i> Pygmy Nuthatch	G5/S4		X	X					X	X	
<i>Sorex cinereus</i> Masked Shrew	G5/S5	X						X	X	X	
<i>Sorex hoyi</i> Pygmy Shrew	G5/S3	X						X		X	
<i>Sorex monticolus</i> Dusky or Montane Shrew	G5/S5								X	X	
<i>Sorex palustris</i> Water Shrew	G5/S4							X	X	X	
<i>Sorex vagrans</i> Vagrant Shrew	G5/S4	X						X	X	X	

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Sphyrapicus nuchalis</i> Red-Naped Sapsucker	G5/S4B			X			X	X	X	X	X
<i>Sphyrapicus thyroideus</i> Williamson's Sapsucker	G5/S4B			X			X		X		
<i>Spinus pinus</i> Pine Siskin	G5/S5	X							X	X	X
<i>Spinus tristis</i> American Goldfinch	G5/S5B	X						X	X		X
<i>Spizella arborea</i> ⁵ American Tree Sparrow	G5/SNA	X							X	X	X
<i>Spizella pallida</i> Clay-Colored Sparrow	G5/S4B	X					X		X		
<i>Spizella passerina</i> Chipping Sparrow	G5/S5B	X					X		X	X	X
<i>Stelgidopteryx serripennis</i> Northern Rough-Winged Swallow	G5/S5B	X					X	X	X	X	X
<i>Streptopelia decaocto</i> ⁵ Eurasian Collared-Dove	G5/SNA					X ⁶			X		
<i>Strix nebulosa</i> Great Gray Owl	G5/S3	X		X	Cliffs				X	X	X
<i>Strix varia</i> Barred Owl	G5/S4			X				X	X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Sturnella neglecta</i> Western Meadowlark	G5/S5B	X							X	X	X
<i>Sturnus vulgaris</i> ⁵ European Starling	G5/SNA	X							X	X	X
<i>Surnia ulula</i> Northern Hawk Owl	G5/S3	X		X	Burned forest				X	X	
<i>Synaptomys borealis</i> Northern Bog Lemming	G5/S2, Sensitive on Flathead National Forest and adjacent Forests				Peatlands			X		X	
<i>Tachycineta bicolor</i> Tree Swallow	G5/S5B	X		X			X	X	X	X	
<i>Tachycineta thalassina</i> Violet-Green Swallow	G5/S5B	X		X	Cliffs		X	X	X	X	X
<i>Tamias amoenus</i> Yellow-Pine Chipmunk	G5/S5							X	X	X	
<i>Tamias ruficaudus</i> Red-tailed Chipmunk	G5/S4							X	X	X	
<i>Tamiasciurus hudsonicus</i> Red (Pine) Squirrel	G5/S5			X				X	X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Taxidea taxus</i> Badger	G5/S4	X				X ⁶			X	X	
<i>Thamnophis elegans</i> Terrestrial Garter Snake	G5/S5	X						X	X	X	X
<i>Thamnophis elegans</i> Western Terrestrial Garter Snake	G5/S5	X						X			
<i>Thamnophis sirtalis</i> Common Garter Snake	G5/S4	X						X	X	X	
<i>Thomomys talpoides</i> ⁵ Northern Pocket Gopher	G5/S5	X							X	X	X
<i>Tringa flavipes</i> ⁵ Lesser Yellowlegs	G5/SNA	X						X	X		
<i>Tringa melanoleuca</i> ⁵ Greater Yellowlegs	G5/SNA	X						X	X		
<i>Tringa solitaria</i> ⁵ Solitary Sandpiper	G5/SNA	X						X			
<i>Troglodytes aedon</i> House Wren	G5/S5B	X		X			X		X	X	
<i>Troglodytes pacificus</i> Pacific Wren	G5/S3		X	X				X	X	X	X

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Turdus migratorius</i> American Robin	G5/S5B	X			Burned forest		X	X	X	X	X
<i>Tyrannus tyrannus</i> Eastern Kingbird	G5/S5B	X					X	X	X	X	
<i>Tyrannus verticalis</i> Western Kingbird	G5/S5B	X					X		X	X	
<i>Urocitellus columbianus</i> Columbian Ground Squirrel	G5/S5	X							X	X	X
<i>Ursus americanus</i> Black Bear	G5/S5	X	X	X		X		X	X	X	X
<i>Ursus arctos</i> Grizzly Bear	G4/S2S3, Threatened	X			Burned forest			X	X	X	X
<i>Vireo cassinii</i> Cassin's Vireo	G5/S4B	X					X		X	X	X
<i>Vireo gilvus</i> Warbling Vireo	G5/S5B	X					X	X	X	X	X
<i>Vireo olivaceus</i> Red-Eyed Vireo	G5/S4B	X					X	X	X	X	
<i>Vulpes vulpes</i> Red Fox	G5/S5	X				X ⁶		X	X	X	
<i>Xanthocephalus xanthocephalus</i> Yellow-Headed Blackbird	G5/S5B	X					X	X			
<i>Zapus princeps</i> Western Jumping Mouse	G5/S4							X	X	X	

Species ¹ Name	Species Status ²	Grass Forb/Shrub	Old-Growth Forest	Snag or Downed Log	Unique ³ Habitat Associate	Hunted or Trapped	Neotropical Migrant	Aquatic, Wetland, and/or Riparian	Warm-Moist to Warm-Dry PVT	Cool-Wet to Cool-Dry (Cool-Moist) PVT	Cold PVT
<i>Zenaida macroura</i> Mourning Dove	G5/S5B	X						X	X	X	
<i>Zonotrichia albicollis</i> ⁵ White-Throated Sparrow	G5/SNA	X							X	X	
<i>Zonotrichia leucophrys</i> White-Crowned Sparrow	G5/S5B	X							X		X
<i>Zonotrichia querula</i> ⁵ Harris's Sparrow	G5/SNA	X								X	

Note. PVT = potential vegetation type.

1. Species with only one or two total observations in the Montana Natural Heritage Program database were not listed. The species in this table have known occurrence on or within 0.5 mile of Flathead National Forest lands as of 2013. The list was reviewed by T. Their and C. Hammond (Montana Fish, Wildlife and Parks), D. Casey of American Bird Conservancy, and S. Gniadek of Flathead Audubon in December 2014.

2. USFWS threatened, endangered, proposed, or candidate species, November 17, 2017 listing. Global (G1-5) and state (S1-5) species ranking from Montana Natural Heritage Program list, obtained December 2013; Regional Forester's species of conservation concern (SCC) list as of December 2017; 2011 Regional forester's sensitive species list for the Kootenai, Lolo, and Lewis and Clark/Helena National Forests and species previously identified as sensitive for the Flathead National Forest. Note: species status may change over time, and subsequent updates are anticipated.

3. Habitat associations based upon GIS analysis of Montana Natural Heritage Program data. Habitat associations reviewed and edited by T. Their and C. Hammond (Montana Fish, Wildlife and Parks) in December 2014. Includes features such as caves, talus, snowfields/glaciers, fell/boulder fields, cliffs, waterfalls, and intensively burned habitats.

4. Typically a valley-bottom species; more than 25 years of amphibian monitoring has not detected this species on NFS lands.

5. Montana Natural Heritage Program has determined a conservation status rank is not applicable because the species is not a suitable target for conservation activities as a result of being (1) not confidently present in the state, (2) exotic or introduced, (3) a long-distance migrant with accidental or irregular stopovers, (4) a hybrid without conservation value, or (5) believed to be extinct throughout its range or extirpated in Montana or believed to be incidental on NFS lands based on specific observations of animals or their tracks.

6. Species hunted or trapped but not regulated by Montana Fish, Wildlife and Parks, Region 1.

7. Is not a resident species on the Forest, members of the Sun River herd are occasionally observed in the Bob Marshall Wilderness portion of the Forest.

8. Has not been verified on the Forest with DNA evidence in the last 20 years; tracks and observations can be confused with marten.

Plant species, species status, and habitat associations

Table 6-4 through table 6-8 list plant species that represent the diversity of habitats on the Flathead Forest. The tables include plant species previously identified as sensitive and known to occur on the Forest, threatened and endangered species, and species of conservation concern (SCC) as designated by the regional forester for the final environmental impact statement. A brief description of habitat associations is provided. More detailed information on plant characteristics, habitats, distribution, and observations is available from the Montana Natural Heritage Program and NatureServe databases.

Table 6-4. Plant species, species status, and habitat associations for the peatland/fen group

Name	Flathead National Forest SCC Status	Other Status ¹	State Status ²	Global/State Rank ²	Habitat
<i>Amblyodon dealbatus</i> Amblyodon Moss	Not SCC	—	PSOC	G3G5/SH	Fens and wetlands, often with calcareous substrate.
<i>Amerorchis rotundifolia</i> Roundleaf Orchid	SCC	Sensitive	SOC	G5/S3	Spruce forest ecotones around fens, seeps, or along streams, often in soil derived from limestone.
<i>Carex chondorrhiza</i> Creeping Sedge	SCC	Sensitive	SOC	G5/S3	Wet, organic soil of fens in the montane zone.
<i>Carex lacustris</i> Lake-Bank Sedge	SCC	Sensitive	SOC	G5/S1S2	Marshes and fens.
<i>Cypripedium parviflorum</i> Small Yellow Lady's-Slipper	Not SCC	Sensitive	PSOC	G5/S3S4	Fens, damp mossy woods, seepage areas, and moist forest-meadow ecotones in the valley to lower montane zones.
<i>Cypripedium passerinum</i> Sparrow's-Egg Lady's-Slipper	SCC	Sensitive	SOC	G5/S2S3	Mossy, moist, or seepy places in coniferous forests, often on calcareous substrates.
<i>Drosera anglica</i> English Sundew	Not SCC	Sensitive	SOC	G5/S3	With sphagnum moss in wet, organic soils of fens in the montane zone.
<i>Drosera linearis</i> Slenderleaf Sundew	SCC	Sensitive	SOC	G4G5/S2	Wet, organic soil of nutrient-poor fens in the montane zone. Resides in specialized, limited habitat (wilderness and research natural areas).
<i>Eleocharis rostellata</i> Beaked Spikerush	SCC	Sensitive	SOC	G5/S3	Wet, often alkaline soils, associated with warm springs or fens in the valley and foothills zones.
<i>Eriophorum gracile</i> Slender Cottongrass	SCC	Sensitive	SOC	G5/S3	Wet, organic soil of fens from low to moderate elevations.
<i>Howellia aquatilis</i> Water Howellia	Not SCC	USFWS Threatened	—	—	Wetlands and peatlands.
<i>Liparis loeselii</i> Loesel's Twayblade	SCC	Sensitive	SOC	G5/S2	Wet, organic soils of calcareous fens in the valley and montane zones.
<i>Lycopodium inundatum</i> Northern Bog Clubmoss	SCC	Sensitive	SOC	G5/S2	Wet, organic soil of nutrient-poor fens in the valley and lower montane zones.
<i>Meesia triquetra</i> Meesia Moss	SCC	Sensitive	SOC	G5/S2	Found in fen and peat dome at slope base fed by perennial springs; also adjacent to shallow pool/pond and in wet lawn.

Name	Flathead National Forest SCC Status	Other Status ¹	State Status ²	Global/State Rank ²	Habitat
<i>Scheuchzeria palustris</i> Pod Grass	Not SCC	Sensitive	SOC	G5/S3	Wet, organic soil of fens in the valley and montane zones, usually with sphagnum moss.
<i>Scorpidium scorpioides</i> Scorpidium Moss	SCC	Sensitive	SOC	G5/S2	Found on wet soil in calcareous seeps and fens.
<i>Sphagnum magellanicum</i> Magellan's Peatmoss	SCC	—	SOC	G5/S1	Rich fens, peatlands.
<i>Trichophorum alpinum</i> Hudson's Bay Bulrush	SCC	—	SOC	G5/S2	Wet, cold organic soil of fens and slopes in the montane and subalpine zones. Sphagnum lawns and other very wet places.
<i>Trichophorum cespitosum</i> Tufted Club-Rush	SCC	Sensitive	SOC	G5/S2	Wet meadows and sphagnum-dominated fens in the montane to alpine zones.

1. Species previously listed as sensitive by the regional forester as of December 2017. USFWS threatened, endangered, proposed, or candidate species, November 17, 2017 listing (USFWS, 2017).
2. Montana Natural Heritage Program state status: species of concern (SOC) and potential species of concern (PSOC); global (G1-5) and state (S1-5) species rankings. See <http://mtnhp.org/SpeciesOfConcern/?AorP=p>. Regional forester's species of conservation concern (SCC) list as of October 2017.

Table 6-5. Plant species, species status, and habitat associations for the aquatic group

Name	Flathead National Forest SCC Status	Other Status ¹	State Status ²	Global/State Rank ²	Habitat
<i>Bidens beckii</i> Beck Water-Marigold	Not SCC	Sensitive	SOC	G5/S2	Still or slow-moving water of lakes, rivers, and sloughs in the valleys, 0.1-3 meters deep.
<i>Heteranthera dubia</i> Water Star-Grass	Not SCC	Sensitive	SOC	G5/S1S2	Shallow water of riverine sloughs, backwaters; valleys.
<i>Potamogeton obtusifolius</i> Blunt-Leaved Pondweed	Not SCC	Sensitive	SOC	G5/S3	Shallow water of lakes, ponds, and sloughs in the valley, foothill, and montane zones.
<i>Schoenoplectus subterminalis</i> Water Bulrush	Not SCC	Sensitive	SOC	G5/S3	Found in open water and boggy margins of ponds, lakes, and sloughs at 0.1-3 meters depth in the valley, foothill, and montane zones.
<i>Verrucaria kootenaica</i> Speck Lichen	Not SCC	—	SOC	G2/S1S2	On stable limestone rocks below the high water line of large streams

1. Species previously listed as sensitive by the regional forester as of December 2017. USFWS threatened, endangered, proposed, or candidate species, November 17, 2017 listing (USFWS, 2017).
2. Montana Natural Heritage Program state status: species of concern (SOC) and potential species of concern (PSOC); global (G1-5) and state (S1-5) species rankings. See <http://mtnhp.org/SpeciesOfConcern/?AorP=p>.

Table 6-6. Plant species, species status, and habitat associations for the wetlands/riparian group

Name	Flathead National Forest SCC Status	Other Status ¹	State Status ²	Global/State Rank ²	Habitat
<i>Epipactis gigantea</i> Giant Helleborine	SCC	Sensitive	SOC	G4/S2S3	Streambanks, lake margins, fens with springs and seeps, often near thermal waters.
<i>Ophioglossum pusillum</i> Adder's Tongue	Not SCC	Sensitive	SOC	G5/S3	Wet meadows, margins of fens, and gravelly moist soil in the valley and montane zones; some populations occur in roadsides and ditches.
<i>Petasites frigidus</i> var. <i>frigidus</i> Arctic Sweet Coltsfoot	SCC	Sensitive	SOC	G5T5/S2	Swamps, fen margins, and riparian seeps within open forest and meadows in the valley and foothill zones.

1. Species previously listed as sensitive by the regional forester as of December 2017. USFWS threatened, endangered, proposed, or candidate species, November 17, 2017 listing (USFWS, 2017).
2. Montana Natural Heritage Program state status: species of concern (SOC) and potential species of concern (PSOC); global (G1-5) and state (S1-5) species rankings. See <http://mtnhp.org/SpeciesOfConcern/?AorP=p>. Regional forester's species of conservation concern (SCC) list as of October 2017.

Table 6-7. Plant species, species status, and habitat associations for the alpine group

Name	Flathead National Forest SCC Status	Other Status ¹	State Status ²	Global/State Rank ²	Habitat
<i>Cardamine rupicola</i> Cliff Toothwort	Not SCC	—	SOC	G3/S3	Sparsely vegetated, stony soil or talus derived from limestone in the subalpine and alpine zones
<i>Draba densifolia</i> Dense-Leaf Draba	Not SCC	—	SOC	G5/S2	Gravelly, open soil of rocky slopes and exposed ridges in the montane to alpine zones. Generally on dry sites.
<i>Erigeron lackschewitzii</i> Lackschewitz' Fleabane	Not SCC	Sensitive	SOC	G3/S3	Open, gravelly, calcareous soil and talus on ridgetops in the alpine and subalpine zones.
<i>Papaver pygmaeum</i> Alpine Glacier Poppy	Not SCC	—	SOC	G3/S2S3	Sparsely vegetated, stony soil of exposed slopes and ridgetops in the alpine zone
<i>Physaria saximontana</i> var. <i>dentata</i> Rocky Mountain Twinpod	Not SCC	—	SOC	G3T3/S3	Typically found in limestone-derived talus, fellfields, and gravelly slopes at moderate to high elevations.
<i>Pinus albicaulis</i> Whitebark Pine	Not SCC	USFWS candidate	—	—	Subalpine to alpine zones in central and western Montana; upper montane near treeline
<i>Polystichium kruckebergii</i> Kruckeberg's Swordfern	Not SCC	—	SOC	G4/S2S3	Cliff crevices and talus slopes in montane to alpine zones.
<i>Potentilla nivea</i> var. <i>pentaphylla</i> Five-Leaf Cinquefoil	Not SCC	Sensitive	SOC	G5T4/S3	Dry, gravelly soil of exposed ridges and slopes in the montane to alpine zones.
<i>Saussurea densa</i> Dwarf Saw-Wort	Not SCC	—	SOC	G4Q/S2S3	Calcareous soil of talus slopes and rocky, open slopes in the alpine zone

Name	Flathead National Forest SCC Status	Other Status ¹	State Status ²	Global/State Rank ²	Habitat
<i>Solorina bispora</i> Chocolate Chip Lichen	Not SCC	—	SOC	G5/S1S2	On calcareous soil or humus on moist sites in alpine to subalpine habitats
<i>Solorina spongiosa</i> Fringed Chocolate Chip Lichen	Not SCC	—	SOC	G4G5/S1S2	In moist moss mats on soil, adjacent to springs, seeps, waterfalls, and creeks; in alpine/subalpine zones.
<i>Synthyris canbyi</i> Mission Mountain Kittentails	Not SCC	—	SOC	G2G3/S2S3	Open, rocky, usually calcareous soil of talus slopes and windswept ridgetops in the subalpine and alpine zones.
<i>Syntrichia norvegica</i> Norwegian Syntrichia Moss (syn. = <i>Tortula norvegica</i>)	Not SCC	—	SOC	G5/S1	On soil and rock, arctic and alpine to about 8,900 feet elevation.

1. Species previously listed as sensitive by the regional forester as of December 2017. USFWS threatened, endangered, proposed, or candidate species, November 17, 2017 listing (USFWS, 2017).
2. Montana Natural Heritage Program state status: species of concern (SOC) and potential species of concern (PSOC); global (G1-5) and state (S1-5) species rankings. See <http://mtnhp.org/SpeciesOfConcern/?AorP=p>.

Table 6-8. Plant species, species status, and habitat associations for the mesic montane, disturbance, rock/talus/scree group

Name	Flathead National Forest SCC Status	Other Status ¹	State Status ²	Global/State Rank ²	Habitat
<i>Aloina brevirostris</i> Aloina Moss	Not SCC	—	SOC	G4G5/S1	Calcareous soil and on overturned tree bases. May also be a pioneer species on road cuts and riverbanks.
<i>Asplenium trichomanes</i> Maidenhair Spleenwort	Not SCC	—	PSOC	G5/S?	Moist rock crevices and talus slopes in the montane zone.
<i>Botrychium ascendens</i> Upward-Lobed Moonwort	Not SCC	Sensitive	SOC	G3/S3	Various mesic sites from low to moderate elevations, including roadsides and other disturbed habitats.
<i>Botrychium crenulatum</i> Wavy Moonwort	Not SCC	Sensitive	SOC	G3/S3	Various mesic sites from low to moderate elevations, including roadsides and other disturbed habitats.
<i>Botrychium hesperium</i> Western Moonwort	Not SCC	Sensitive	SOC	G4/S3	Various dry to mesic sites from valley bottoms to the subalpine zone, including roadsides and other disturbed habitats.
<i>Botrychium paradoxum</i> Peculiar Moonwort	SCC	Sensitive	SOC	G3G4/S3	Mesic meadows associated with spruce and lodgepole pine forests in the montane and subalpine zones; also found in springy western red cedar forests.
<i>Botrychium pedunculatum</i> Stalked Moonwort	SCC	Sensitive	SOC	G3G4/S2	Various mesic sites from valley bottoms to the montane zone. The most common habitats are western red cedar bottomlands.
<i>Brigantiaea praitermissa</i> A lichen	Not SCC	—	PSOC	GNR/S2S3	On conifer bark in low, moist forests.

Name	Flathead National Forest SCC Status	Other Status ¹	State Status ²	Global/State Rank ²	Habitat
<i>Callicladium haldanianum</i> Callicladium Moss	Not SCC	—	PSOC	G5/SH	On rotten wood and soil.
<i>Castilleja cervina</i> Deer Indian Paintbrush	Not SCC	—	SOC	G4/SH	Grasslands and open coniferous forests in the valley and lower montane zones.
<i>Collema curtisporum</i> Jelly Lichen	SCC	Sensitive	SOC	G3/S1	Moist riparian forests, often in narrow sheltered valleys. Substrate: trunk (bark) of <i>Populus trichocarpa</i> ; occasionally on conifer twigs.
<i>Corydalis sempervirens</i> Pale Corydalis	SCC	Sensitive	SOC	G4G5/S2	Montane; rocky, disturbed or eroding soil of steep slopes in open forest, often appearing after fire.
<i>Cypripedium fasciculatum</i> Clustered Lady's-Slipper	SCC	Sensitive	SOC	G4/S2	Montana occurrences are mostly in warm, dry, mid-seral montane forest in the Douglas-fir/ninebark and grand fir/ninebark habitat types.
<i>Dicranella schreberiana</i> Schreber's Dicranella Moss (syn. = <i>Dicranella grevilleana</i>)	Not SCC	—	SOC	G5/S1	Disturbed, damp, basic soil, usually at high altitudes; on damp soil from the lowlands to 6,500 feet, more common in the mountains.
<i>Dryopteris cristata</i> Crested Shieldfern	SCC	Sensitive	SOC	G5/S3	Moist to wet, often organic soils at the forest margins of fens and swamps in the montane zone.
<i>Grimmia brittoniae</i> Britton's Dry Rock Moss	SCC	Sensitive	SOC	G2/S2	Vertical faces of shaded, calcareous cliffs. Moderate elevations (1,640 to 2,300 feet). Grows on cliffs in warm, dry but climatically moist valley bottoms or forests dominated by Douglas-fir.
<i>Grindelia howellii</i> Howell's Gumweed	SCC	Sensitive	SOC	G3 S2S3	Vernally moist, lightly disturbed soil adjacent to ponds and marshes, as well as similar human-created habitats such as roadsides and grazed pastures.
<i>Idahoia scapigera</i> Scalepod	SCC	Sensitive	SOC	G5/S1S2	Vernally moist, open soil on rock ledges in the lower montane zone.
<i>Lathyrus bijugatus</i> Latah Tule Pea	Not SCC	Sensitive	SOC	G4/S2S3	Open ponderosa pine and western larch forests in the valley and lower montane zones.
<i>Lobaria hallii</i> A Lichen	Not SCC	—	SOC	G4?/S2	On bark and wood. Usually on <i>Populus</i> species, though sometimes on other deciduous trees or shrubs. Moist lowland riparian areas.
<i>Mimulus ampliatus</i> Stalked-Leaved Monkeyflower	Not SCC	Sensitive	SOC	G3/S3	Open seeps and vernal moist soil along slopes, cliffs, and streams from the valleys to the subalpine zone.
<i>Mimulus breviflorus</i> Short-Flowered Monkeyflower	SCC	Sensitive	SOC	G4/S1S2	Shallow, vernal moist soil among rock outcrops in coniferous forests or grasslands in the montane zone.
<i>Parmeliella triptophylla</i> Lead Lichen	Not SCC	—	SOC	G5/S1	In moist environments at tree bases, on rocks, and on moss over rocks.
<i>Polygonum austinae</i> Austin's knotweed	Not SCC	Sensitive	PSOC	G5T4/S3S4	Gravelly, often shale-derived soil of open slopes and banks in the montane zone.
<i>Pseudocyphellaria anomala</i> Netted Specklebelly Lichen	Not SCC	—	SOC	G2G4/S1	Generally on deciduous trees and shrubs; occasionally on coniferous trees; rarely on rock.

Name	Flathead National Forest SCC Status	Other Status ¹	State Status ²	Global/State Rank ²	Habitat
<i>Ramalina obtusata</i> Hooded Ramalina Lichen	Not SCC	—	SOC	G5/S2	On tree and shrub bark in low-elevation riparian forests.
<i>Silence spaldingii</i> Spalding's Campion (or Catchfly)	Not SCC	USFWS Threatened	—	—	Open grasslands with rough fescue or bluebunch wheatgrass.

1. Species previously listed as sensitive by the regional forester as of December 2017. USFWS threatened and endangered, proposed, or candidate species, November 17, 2017 listing (USFWS, 2017).
2. Montana Natural Heritage Program state status: species of concern (SOC) and potential species of concern (PSOC); global (G1-5) and state (S1-5) species rankings. See <http://mtnhp.org/SpeciesOfConcern/?AorP=p>. Regional forester's species of conservation concern (SCC) list as of October 2017.

Invertebrate species, species status, and habitat associations

Table 6-9 lists invertebrate species that may occur within the diversity of habitats on the Flathead National Forest. The table shows species whose range includes the Forest, but not all species are known to occur on national forest system lands because surveys have not been completed. More detailed information on invertebrate characteristics, habitats, distribution, and observations is available from the Montana Natural Heritage Program and NatureServe databases.

Table 6-9. Invertebrate species, species status, and habitat associations

Species Name	Species Status ¹	Aquatic, Wetland, and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
<i>Salmasellus steganothrix</i> ³ A Cave Obligate Isopod	G2G3/S1S2		X				
<i>Ephydatia cooperensis</i> ³ A Freshwater Sponge	G1G3/S1S3	X					
<i>Caenis youngi</i> ³ A Mayfly	G4/S2	X					
<i>Parameletus columbiae</i> ³ A Mayfly	G2/S1	X					
<i>Rhyacophila ebria</i> ³ A Rhyacophilan Caddisfly	G2G3/S1	X					
<i>Rhyacophila gemona</i> ³ A Rhyacophilan Caddisfly	G2G3/S2	X					
<i>Rhyacophila glacier</i> ³ A Rhyacophilan Caddisfly	G3/S1	X					

Species Name	Species Status ¹	Aquatic, Wetland, and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
<i>Rhyacophila potteri</i> ³ A Rhyacophilan Caddisfly	G3/S2	X					
<i>Rhyacophila rickeri</i> ³ A Rhyacophilan Caddisfly	G3G4/S2	X					
<i>Isocapnia crinite</i> ³ A Stonefly	G4/S2	X					
<i>Stygobromus tritus</i> ² A Subterranean Amphipod	G1G2/S1S2	X					
<i>Boloria alberta</i> ³ Alberta Fritillary	G3/S2/S3			X			X
<i>Isocapnia integra</i> ³ Alberta Snowfly	G4/S2	X					
<i>Rhyacophila alexanderi</i> ³ Alexander's Rhyacophilan Caddisfly	G2/S2	X					
<i>Oreohelix alpina</i> Alpine Mountainsnail	G1/S1			X			X
<i>Agapetus montanus</i> ³ An Agapetus Caddisfly	G3/S3	X					
<i>Oreohelix amariradix</i> ³ Bitterroot Mountainsnail	G1G2/S1S2			X		X	
<i>Aeshna tuberculifera</i> Black-Tipped Darner	G4/S2S4	X					
<i>Rhionaeschna multicolor</i> Blue-Eyed Darner	G5/S2S4	X					
<i>Leucorrhinia borealis</i> ³ Boreal Whiteface	G5/S1	X					
<i>Somatochlora walshii</i> Brush-Tipped Emerald	G5/S1S2	X					
<i>Oreohelix elrodi</i> Carinate Mountainsnail	G1/S1			X	X		
<i>Soliperla salish</i> ³ Clearwater Roachfly	G2/S2	X					

Species Name	Species Status ¹	Aquatic, Wetland, and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
<i>Utacaphnia columbiana</i> ³ Columbian Snowfly	G4/S2	X					
<i>Zapada cordillera</i> ³ Cordilleran Forestfly	G3/S2	X					
<i>Boloria frigga</i> ³ Frigga Fritillary	G5/S1S2	X					
<i>Euphydryas gillettii</i> Gillette's Checkerspot	G3/S2	X			X	X	
<i>Stygobromus glacialis</i> ³ Glacier Amphipod	G1G3/S1S2	X					
<i>Polygonia progne</i> ³ Gray Comma	G4G5/S2	X			X		
<i>Polygyrella polygyrella</i> ³ Humped Coin	G3/S1S2			X	X		
<i>Oreohelix carinifera</i> ³ Keeled Mountainsnail	G1/S1			X			
<i>Discus brunsoni</i> ³ Lake Disc	G1/S1			X			
<i>Physa Physa megalochlamys</i> ³ Large-Mantle Physa	G3G4/S1	X					
<i>Caurinella idahoensis</i> ³ Lolo Mayfly	G3/S2	X					
<i>Oreohelix haydeni</i> ³ Lyrate Mountainsnail	G2G3/S1S3			X			
<i>Magnipelta mycophaga</i> ³ Magnum Mantleslug	G3/S2S3	X		X	X		
<i>Hemphillia danielsi</i> ³ Marbled Jumping-Slug	G2G3/S1S2	X		X	X		
<i>Lednia tumana</i> Meltwater Lednian Stonefly	G1G2/S1, USFWS proposed species	X					
<i>Goereilla baumanni</i> ³ Northern Rocky Mountains Refugium Caddisfly	G2/S2	X					

Species Name	Species Status ¹	Aquatic, Wetland, and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
<i>Rossiana Montana</i> ³ Northern Rocky Mountains Refugium Caddisfly	G2G3/S2	X					
<i>Sericostriata surdickae</i> ³ Northern Rocky Mountains Refugium Caddisfly	G3/S3	X					
<i>Caudatella edmunds</i> ³ Northern Rocky Mountains Refugium Mayfly	G3G4/S3	X					
<i>Somatochlora minor</i> Ocellated Emerald	G5/S2S4	X					
<i>Hemphillia camelus</i> ³ Pale Jumping-Slug	G4/S1	X					
<i>Kootenaia burkei</i> ³ Pygmy Slug	G2/S1S2	X			X		
<i>Sympetrum madidum</i> Red-Veined Meadowhawk	G4/S2S3	X					
<i>Prophysaon andersoni</i> ³ Reticulate Taildropper	G5/S1S2	X			X		
<i>Haplotrema vancouverense</i> ³ Robust Lancetooth	G5/S1S2				X		
<i>Acroloxus coloradensis</i> ³ Rocky Mountain Capshell	G3/S1	X					
<i>Colligyrus greggi</i> ³ Rocky Mountain Dusksnail	G4/S1	X					
<i>Soyedina potteri</i> ³ Northern Rocky Mountains Refugium Stonefly	G2/S2	X					
<i>Zacoleus idahoensis</i> ³ Sheathed Slug	G3G4/S2S3			X	X		
<i>Pristiloma wascoense</i> ³ Shiny Tightcoil	G3/S1S3			X	X		
<i>Prophysaon humile</i> Smoky Taildropper	G3/S2S3	X		X	X		
<i>Isoperla petersoni</i> ³ Springs Stripetail	G5/S2	X					

Species Name	Species Status ¹	Aquatic, Wetland, and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
<i>Discus shimekii</i> ³ Striate Disc	G5/S1				X		
<i>Coenagrion interrogatum</i> ³ Subarctic Bluet	G5/S1S2	X					
<i>Aeshna subarctica</i> Subarctic Darner	G5/S1S2	X					
<i>Zapada glacier</i> ³ Western Glacier Stonefly	G1/S1	X					
<i>Margaritifera falcata</i> ^{2,3} Western Pearlshell	G4G5/S2	X					

1. USFWS threatened, endangered, proposed, or candidate species as of November 17, 2017 (USFWS, 2017). Montana Natural Heritage Program global (G1-5) and state (S1-5) ranking.
2. Previously listed as a sensitive species on the Forest (Regional Forester 2011).
3. Not known to occur on NFS lands.

Table 6-10 lists aquatic vertebrate species, their species status, and whether they are found in lentic, lotic, or fished habitats.

Table 6-10. Aquatic vertebrate species, species status, and habitat associations

Species Name	Lentic¹	Lotic²	Fished	Species Status³
<i>Thymallus arcticus</i> Arctic Grayling	X		X	G5/S1 Non-native
<i>Salvelinus confluentus</i> Bull Trout	X	X	X	G4/S2 Threatened
<i>Salvelinus fontinalis</i> Brook Trout	X	X	X	G5/SNA Non-native
<i>Oncorhynchus mykiss</i> Rainbow Trout ²	X	X	X	G5/S5 Non-native
<i>Oncorhynchus clarkii lewisi</i> Westslope Cutthroat trout	X	X	X	G4T3/S2 Sensitive Native
<i>Cottus cognatus</i> Slimy Sculpin	X	X		G5/S5 Native
<i>Cottus bondi</i> Rocky Mountain Sculpin		X		GNR/SNR Native
<i>Richardsonius balteatus</i> Redside Shiner	X	X		G5/S5 Native
<i>Prosopium coulterii</i> Pygmy Whitefish	X			G5/S3 Native
<i>Prosopium williamsoni</i> Mountain Whitefish	X	X	X	G5/S5 Native
<i>Catostomus macrocheilus</i> Largescale Sucker	X	X		G5/S5 Native
<i>Catostomus catostomus</i> Longnose Sucker	X	X		G5/S5 Native
<i>Mylocheilus caurinus</i> Peamouth Chub	X			G5/S5 Native
<i>Ptychocheilus oregonensis</i> Northern Pikeminnow	X			G5/S5 Native
<i>Salvelinus namaycush</i> Lake Trout	X		X	G5/SNA Non-native
<i>Esox Lucius</i> Northern Pike	X	X	X	G5/S5 Non-native
<i>Perca flavescens</i> Yellow Perch	X		X	G5/SNA Non-native
<i>Sander vitreus</i> Walleye	X		X	G5/SNA Non-native
<i>Oncorhynchus nerka</i> Kokanee Salmon	X		X	G5/SNA Non-native
<i>Micropterus salmoides</i> Largemouth Bass	X		X	G5/SNA Non-native

Species Name	Lentic ¹	Lotic ²	Fished	Species Status ³
<i>Lepomis gibbosus</i> Pumpkinseed	X			G5/SNA Non-native
<i>Micropterus dolomieu</i> Smallmouth Bass	X		X	G5/SNA Non-naive

1. Inhabiting, or situated in, still, fresh water.
2. Inhabiting, or situated in rapidly moving fresh water.
3. Threatened and endangered, proposed, or candidate species, November 17, 2017 listing (USFWS, 2017). Montana Natural Heritage Program global (G1-5) and state (S1-5) species ranking (2013); species with a global or state rank of 1 or 2. Previously listed as a sensitive species on the Forest (Regional Forester 2011). Other fish occur on the Forest; they are not listed because they do not fall into one of the above categories.

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Appendix 7: Summary of Climate Adaptation Strategy

Table 7-1. Climate adaptation strategies to sustain fundamental ecological functioning of aquatic and riparian resources 1

Table 7-2. Climate adaptation strategies to sustain terrestrial species and communities 4

Table 7-3. Climate adaptation strategies addressing knowledge gaps and planning for the future 7

The climate in the northern Rocky Mountains has changed in the past and will continue to change in the future. Climate influences the ecosystem services we obtain from forests and grasslands, and understanding how climate may change in the future in the context of resource management was a consideration in development of the Flathead forest plan. Plan direction incorporates strategies to address the uncertainties associated with a changing climate and its potential effects on ecosystems. The strategies for the Flathead forest plan integrate the management approaches of promoting *resilience*¹ to change, creating *resistance*² to change, and enabling forests to *respond*³ to change (Millar, Stephenson, & Stephens, 2007). The Northern Rockies Adaptation Partnership publication by Halofsky et al. (in press) is the main source of information on possible strategies and approaches. Initiated in 2013, this is a science-management partnership consisting of multiple agencies, organizations, and stakeholders who worked together over a period of two years to identify issues relevant to resource management in the Northern Rocky Mountains and to find practical solutions that can make ecosystems adaptable to the effects of a changing climate. Table 7-1 through table 7-3 below provide a summary of the strategies and how they were addressed in the Forest’s revised plan alternatives.

Table 7-1. Climate adaptation strategies to sustain fundamental ecological functioning of aquatic and riparian resources

Climate Adaptation Strategy	Key Ecosystem Component	Species addressed by strategy	Alternatives that include strategy	How strategy is addressed
Build resilience to changing climate, higher peak flows, higher variability	Aquatic, wetland, and riparian	All aquatic and riparian species	Alternative A—INFISH direction Alternatives B modified, C, D—Watershed (WTR) and riparian management zone (RMZ) plan components; revised forest plan appendix E; FW-STD-IFS-07, FW-GDL-IFS-07	Maintaining the capability of floodplains and riparian areas
Build resilience to higher peak stream flows	Aquatic, wetland, and riparian	All aquatic and riparian species	Flathead National Forest Travel Analysis Report (USDA, 2014)	Conducting a risk assessment of vulnerable roads and infrastructure

¹ Resilience to change is the degree to which the ecosystem can recover from disturbances without a major shift in composition or function. Resilient forests accommodate change and have the ability to quickly recover and regain normal function in the face of climate change and potential stressors, such as drought and changes in disturbance processes.

² Resistance to change is the ability of the ecosystem to withstand disturbances without significant loss of structure or function, i.e., to remain unchanged. The approach manipulates the physical environment to forestall impacts and protect highly valued resources in the face of climate change and potential changes in ecosystem disturbances and processes.

³ Response to change is the ability of the ecosystem to respond adaptively as changes accrue—to accommodate to change rather than to resist it—through such practices as actively shifting species and promoting connected landscapes.

Climate Adaptation Strategy	Key Ecosystem Component	Species addressed by strategy	Alternatives that include strategy	How strategy is addressed
Build resilience to higher peak stream flows	Aquatic, wetland, and riparian	All aquatic and riparian species	Alternative A—INFISH direction Alternatives B modified, C, D—FW-OBJ-WTR-01 through 04; FW-OBJ-CWN 01-02; FW-GDL-WTR-01	Modifying infrastructure where possible (e.g., increasing culvert size, improving road drainage, relocating vulnerable campgrounds or road segments)
Respond to climate-induced occurrence of disturbances such as drought and flooding	Aquatic, wetland, and riparian	All aquatic and riparian species	Alternative A—Many wetlands are in MA12 or riparian habitat conservation areas Alternatives B modified, C, D—Wetlands are in riparian management zones, FW-STD-RMZ-01; FW-DC-WTR-08,10,11,14, 16; FW-GDL-WTR-04	Increasing water storage by recognizing important ecological role of beavers and wetlands
Reduce erosion potential to protect water quality	Aquatic, wetland, and riparian	All aquatic and riparian species	All alternatives—Healthy Forest Restoration Act Alternatives B modified, C, D—FW-DC-TE&V-13, 23 and FW-DC-FIRE-04; FW-GDL-FIRE-02 and 05	Reducing forest densities and fuel loadings in dry forest types of low- to mixed-severity natural fire regimes to reduce the risk of high-severity fire
Reduce erosion potential to protect water quality	Aquatic, wetland, and riparian	All aquatic and riparian species	All alternatives—Project-specific best management practices Alternatives B modified, C, D—FW-DC-RMZ-01; FW-DC-IFS-07; FW-GDL-IFS-06 through 10; FW-GDL-SOIL-03; GA-SM-DC-08, GA-SM-OBJ-03	Using road management practices that reduce erosion and prioritizing municipal water supplies
Increase streamflows and moderating changes in instream flows	Aquatic, wetland, and riparian	All aquatic and riparian species	Alternative A—INFISH direction All alternatives—project-specific best management practices; Alternatives B modified, C, D—FW-DC-WTR-08 and 17	Securing water rights for instream flows
Increase habitat resilience for cold-water aquatic organisms by restoring structure and function of streams	Aquatic, wetland, and riparian	All aquatic and riparian species	Alternative A—INFISH direction All alternatives—project-specific best management practices Alternatives B modified, C, D—Most plan components for water (WTR) and riparian management zones (RMZ); FW-DC-WTR-01 through 11; FW-GDL-IFS-03 through 10; FW-GDL-WTR-01 and 02; FW-GDL-IFS 13 and 14; FW-STD-IFS-07	Restoring natural channel and floodplain form and function; restoring aquatic organism passage structures through design and placement of appropriate structures; maintaining functional stream channel morphology Restoring riparian areas to increase hydrologic function and retain cold water; reintroducing beaver where beaver and management of westslope cutthroat trout are compatible; removing or relocating roads adjacent to riparian areas, channels, and floodplains where they inhibit complexity

Climate Adaptation Strategy	Key Ecosystem Component	Species addressed by strategy	Alternatives that include strategy	How strategy is addressed
Provide opportunities for native fish to move and find suitable stream temperatures	Aquatic, wetland, and riparian	All aquatic and riparian species	Alternative A—INFISH direction All alternatives—project-specific best management practices; Alternatives B modified, C, D—forest plan appendix E; FW-DC-WTR-10; FW-GDL-IFS-14 and 16	Increasing the patch size of favorable habitat to enhance viable populations and allow migratory life histories; modifying or removing barriers to increase connectivity between areas of cold-water habitat; identifying and mapping where groundwater inputs provide cold water
Manage nonnative fish populations to eliminate or reduce their impact on native fish	Aquatic, wetland, and riparian	All aquatic and riparian species	Alternative A—INFISH direction Alternatives B modified, C, D—desired conditions FW-DC-WTR-12 and FW-DC-P&C-02; guidelines FW-GDL-WTR-06 through 08	Removing nonnatives with manual or chemical techniques; excluding nonnatives with physical or electrical barriers
Increase resilience to fire-related disturbance	Aquatic, wetland, and riparian	All aquatic and riparian species	Alternative A—INFISH direction All alternatives—Project-specific best management practices; Alternatives B modified, C, D—Desired conditions FW-DC-TE&V-13, and 23, and FW-DC-FIRE-04; FW-OBJ-WTR-03; FW-OBJ-CWN-01 and 02; FW-GDL-FIRE-02 and 05, FW-GDL-CWN-01	Implementing fuel treatments (thinning, prescribed burning) to reduce wildfire severity and size; disconnecting roads from stream networks to reduce erosion and sediment delivery to streams; installing erosion control structures following wildfires

Table 7-2. Climate adaptation strategies to sustain terrestrial species and communities

Climate Adaptation Strategy	Key Ecosystem Component	Species addressed by strategy	Alternatives that include strategy	How strategy is addressed
<p>Maintain/enhance species and structural diversity at multiple scales</p> <p>Protect forests from severe and uncharacteristic disturbances</p> <p>Reduce impacts of existing stressors, such as insects and disease and invasive species</p>	Forest vegetation (i.e., composition, structure) and ecosystem processes	All native animal and plant species and communities	Alternative A—To some degree, forestwide direction in the Vegetation section (added through amendment 21) Alternatives B modified, C, D—Forest plan components in the Terrestrial Ecosystems and Vegetation section; Non-Native Invasive Species section; Fire section	Developing desired conditions that are based on estimated natural range of variation as well as on anticipated influence of climate changes on forest composition and structures (see Trechsel, 2016); promoting retention and development of large/very large trees of species resilient and/or resistant to disturbance; promoting site-adapted species, such as western larch and western white pine on moist sites, ponderosa pine on dry sites, lodgepole pine on harsh sites; promoting diversity of species, at stand level and landscape level in anticipation of future impacts and uncertainties; focusing on species best adapted to potential changes in climate and disturbances (such as drought, increased fire frequency and severity, and increased insect/disease populations); promoting diversity of forest structures (e.g., size classes/successional stages) at landscape level; protecting existing old-growth forest and promoting development of this forest structural stage; promoting restoration of native species that have been diminished due to a variety of human influences (e.g., exotic disease, land conversion, fire suppression), including western white pine, whitebark pine, and ponderosa pine; promoting diversity of forest densities from very low to high and reducing densities where appropriate using a variety of tools (fire, thinning) and maintaining the reduced forest densities over time

Climate Adaptation Strategy	Key Ecosystem Component	Species addressed by strategy	Alternatives that include strategy	How strategy is addressed
Maintain/create areas where ecological processes are generally allowed to function with minimal human influence	Ecosystem functions and processes (i.e., fire, succession)	All native animal and plant species and communities	All alternatives—Management area designation and associated forest plan direction; FW-STD-RMZ-01	Designating management areas and developing forest plan direction to provide a range of areas that have different management intensities and potential human influences; some areas may serve as “baselines” for understanding how ecological systems function and respond (e.g., current and recommended wilderness areas), and other areas provide more opportunity for active and adaptive management approaches to gain understanding of potential ways to address impacts of climate changes on the ecosystem
Maintain particular species or community types of concern/high vulnerability	Plants	Water howellia and species associated with fens	Alternative A—to some degree, plan components that protect water howellia and INFISH direction for activities within riparian habitat conservation areas Alternative B modified, C, D— Forest plan components in Threatened, Endangered, Proposed, or Candidate Plant Species (PLANT) and Plant Species Diversity (PLANT DIV) sections; management area 3b plan components; FW-STD-RMZ-01, 05 and 06; FW-GDL-RMZ-12 through 15; FW-SUIT-RMZ-01	Designating special areas that feature special/unique botanical and geological features; protecting existing and potential water howellia habitat
Maintain particular species or community types of concern/high vulnerability	Whitebark pine communities and associated wildlife	Whitebark pine; Clark’s nutcracker	Alternatives B modified, C, D— FW-DC-PLANT-03 and 04, FW-DC-TE&V-07, 08, 12, 19 and 25 (cold type); FW-STD-TE&V-02; FW-DC-WL DIV-01; FW-OBJ-PLANT-01	Focusing restoration efforts on sites where whitebark pine is most likely to succeed due to less competition from other species; supporting an active restoration program that includes collection of seed/pollen/scion for tree improvement program; planting of seedlings showing blister rust resistance; thinning in young whitebark pine stands and removing competition of other trees; using fire to promote regeneration of whitebark pine; protecting identified mature trees that are contributing to the restoration program (e.g., cone collection trees) from loss due to fire or other stressors

Climate Adaptation Strategy	Key Ecosystem Component	Species addressed by strategy	Alternatives that include strategy	How strategy is addressed
Maintain particular species or community types of concern/high vulnerability	Ponderosa pine communities and associated wildlife	Ponderosa pine; flammulated owl	Alternatives B modified, C, D—FW-DC-TE&V-07, 08, 12, 14, 16, 19, and 25 (warm-dry and warm-moist types); FW-DC-WL DIV-01; FW-STD-TE&V-03 and snag standards within each geographic area	Retaining mature and older ponderosa pine, reducing competition from Douglas-fir and grand-fir; reducing forest density; monitoring establishment, survival, and development of ponderosa pine by age class; retaining very large trees and snags
Maintain particular species or community types of concern/high vulnerability	Hardwood tree communities and associated wildlife	aspen, black cottonwood, birch; cavity-nesting and deciduous-nesting birds	Alternatives B modified, C, D—FW-DC-TE&V-09; FW-DC-RMZ-04; FW-OBJ-TE&V-03; and FW-OBJ-RMZ-01; FW-DC-GR-03; FW-GDL-GR-02	Removing conifers around aspen at multiple scales using multiple tools, including prescribed fire, cutting; protecting from grazing; prioritizing areas where aspen currently exists but at lower than historic levels
Maintain particular species or community types of concern/high vulnerability	Old-growth mesic conifer forest	White pine, western redcedar, hemlock	Alternative A—old-growth direction from amendment 21; snag retention standard Alternatives B modified, C, D—FW-DC-TE&V-07, 12, 14 through 17, 19 (warm-moist type), FW-DC-WL DIV-01; FW-DC-RMZ-03 and 06; guidelines FW-GDL-RMZ-01, 08, 09 and 10; FW-GDL-TE&V-06 through 09; standards FW-STD-TE&V-01 and 03; snag standards within each geographic area; management area 3b	Maintaining or creating structure in mesic old-growth conifer forest including modeled future fisher habitat; developing redundancy across landscape to buffer against future fire or drought mortality
Maintain multiple levels of connectivity (daily, seasonal, dispersal range shift)	Forestwide, all forest communities	Multiple species, including but not limited to wide-ranging species (e.g., wolverine, Canada lynx, grizzly bear, gray wolf)	All alternatives—Appendix A (Northern Rockies Lynx Management Direction for Canada lynx) ALL 01, ALL S1, ALL G1, LINK 01, LINK S1, LINK G1, and G2 Alternatives B modified, C, D—Desired conditions FW-DC-WTR-02, FW-DC-RMZ-06, FW-DC-WL-02, FW-DC-WL DIV-01, FW-GDL-WL DIV-06; FW-DC-TE&V-14 and 19, FW-DC-LSU-01; FW-DC-P&C-01, GA-HH-DC-03, GA-MF-DC-04, GA-NF-DC-06, GA-NF-DC-07, GA-SM-DC-01 and 03, GA-SV-DC-09; FW-GDL-TE&V-03 and 07; FW-GDL-RMZ-09, 11 and 14; FW-SUIT-RMZ-01; FW-GDL-IFS-12; FW-STD-RMZ-01, 05, and 06	USDA Forest Service Northern Region broadscale monitoring strategy (in development)

Table 7-3. Climate adaptation strategies addressing knowledge gaps and planning for the future

Climate Adaptation Strategy	Key Ecosystem Component	Species addressed by strategy	Alternatives that include strategy	How strategy is addressed
Incorporate increased knowledge and new science related to climate change and species responses	All ecological, social, and economic ecosystem components	All plant and animal species; other resources such as recreation and social/economic components	All alternatives—Northern Region Adaptation Partnership	Developing an adaptive management and monitoring strategy for all resources with a monitoring program that recognizes that (1) climate change is slow (especially in comparison to the forest plan planning period of 15 years) and (2) the future is uncertain and new science/information might lead to changes in the Forest's approaches and adaptation tactics into the future. The Forest Service is an active partner in the Northern Region Adaptation Partnership, a collaborative effort with the goal of increasing climate change awareness, assessing vulnerability, and developing science-based adaptation strategies to reduce adverse effects of climate change.
Build partnerships to include all lands	All ecological, social, and economic ecosystem components	All resource areas	All alternatives	The Forest Service is an active partner with other resource managers and organizations across the Forest and adjacent lands (see final EIS).

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- Millar, C. I., Stephenson, N. L., & Stephens, S. L. (2007). Climate change and forests of the future: Managing in the face of uncertainty. *Ecological Applications*, 17(8), 2145-2151. doi:10.1890/06-1715.1. Retrieved from <Go to ISI>://WOS:000251739800002, <http://onlinelibrary.wiley.com/doi/10.1890/06-1715.1/epdf>.
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Appendix 8—Response to Public Comments

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LIST OF ABBREVIATIONS

Terms	Additional information/full name
amendment forests	Collective term for the Helena-Lewis & Clark, Kootenai, and Lolo National Forests
the Forest	Flathead National Forest
assessment	Assessment of the Flathead National Forest
forest plan	Flathead National Forest Revised Land Management Plan
1986 forest plan	Flathead National Forest Land and Resource Management Plan (1986)
2012 planning rule	National Forest System land management planning rule (effective 2012)

List of Abbreviations

CFR	Code of Federal Regulations
d.b.h.	diameter at breast height
DC	desired condition (forest plan component)
DCA	demographic connectivity area
EIS	environmental impact statement
FW	forestwide (forest plan component)
GA	geographic area
GBCS	Grizzly Bear Conservation Strategy
GDL	Guideline (forest plan component)
GIS	geographic information system
INFISH	Inland Native Fish Strategy
MA	management area
mi	mile
mmbf	million board feet
mmcf	million cubic feet
MFWP	Montana Fish Wildlife and Parks
NCDE	Northern Continental Divide Ecosystem
NEPA	National Environmental Policy Act
NFS	National Forest System
NRLMD	Northern Rockies Lynx Management Direction
PACFISH	Pacific Fish Strategy
PCA	primary conservation area
PIBO	PACFISH/INFISH Biological Opinion
STD	standard (forest plan component)
TMDL	total maximum daily load
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

Introduction

This appendix describes the process used for content analysis of the comments received during the 120-day public comment period of June 3 to October 3, 2016, and includes public comments by individuals and organizations and Forest Service responses to the substantive comments received. A variety of methods were used to inform the public about the draft environmental impact statement (EIS) and the forest plan and grizzly bear amendments. These included emails to subscribers to the plan revision website, news releases, newsletters, media interviews, open houses, contacts with other Federal and local agencies, publication of the notice of availability in the Federal Register, and website www.fs.usda.gov/goto/flathead/fpr.

During the comment period, a total of 33,774 letters were received. Of these letters, 576 received were designated as unique letters. Comment letters were received from 120 organizations. Eighteen organizations prompted 33,112 form letters. Sixty-eight form letters with additional information (form plus letters) were received. In the response to comments section, individual or representative comments are paraphrased or are quoted from directly.

Content Analysis Process

The content analysis of the comments was conducted using a systematic process of reading, coding, and summarizing all of the comments that were submitted. This process ensured that every comment was read, analyzed, and considered. The most helpful comments were those that were unique and specifically related to the plan and analysis in the draft EIS. Each submission was assigned a letter number. Each unique comment was numbered sequentially and coded by topic in a database. Similar comments were grouped, and nearly identical comments were combined. The interdisciplinary team prepared responses for each comment based on its merits, regardless of the source or whether the comment was expressed by one person or by many.

This appendix documents the Forest Service responses to the substantive comments, which have been addressed, as prescribed in 40 CFR 1503.4, in the following ways:

- modifying the forest plan (alternative B modified) or amendments (alternative 2 modified) and alternatives;
- developing or analyzing alternatives not given detailed consideration in the draft EIS;
- supplementing, improving, or modifying the analysis that the draft EIS documented;
- making factual corrections; and/or
- explaining why the comments need no further agency response.

Content analysis is a method commonly used by the Forest Service to gather information about comment letters. Each unique letter was read and substantive comments were identified and coded by major topic. Once the unique and substantially different comments had been coded, the concerns raised by different commenters on the same subject and with the same intent were grouped by subject and category code, which captured the essence of similar concerns. The content analysis process ensured that every comment was read, analyzed, and considered. The substantive comments and their coding were entered into a database, which enabled reports to be run listing all substantive comments by topic. Resource specialists on the Flathead National Forest then combined similar comments into statements that capture the intent of the commenter(s). These statements are the “comments” in the response to comments section. Thus, even though not every comment is quoted in this appendix exactly as written by each respondent, each

comment was considered individually. The comment statements are followed by the responses prepared by the Flathead National Forest planning team. Comments and responses are arranged alphabetically according to resource or topic.

In considering the comments, it is important for readers and decisionmakers to understand that this process makes no attempt to treat comments as if they were votes and therefore give more weight to similar comments made by many different people. Instead, the content analysis process focuses on the content of the comments and ensures that every substantive comment is considered in the decision process.

Resource specialists reviewed all attachments included with comments, and relevant information was considered in the final EIS analysis and plan component development. References to literature have all been reviewed by resource specialists and, where appropriate, citations to the relevant literature have been included in the final EIS and reference sections.

Individual letters are not included in this report but can be viewed online in the Content Analysis and Response Application (CARA) public reading room for this project. Go to <https://cara.ecosystem-management.org/Public//ReadingRoom?Project=46286>.

Demographic Information

Tables 1 through 5 display the demographics of the comments received for the Flathead National Forest draft forest plan, draft EIS, and Northern Continental Divide Ecosystem (NCDE) grizzly bear amendments during the public comment period.

Delivery Type

Comments were delivered from the interested parties in various ways, including electronic deliveries as well as postal and private courier services. Table 8-1 captures the delivery type for comments on the draft EIS.

Table 8-1. Delivery Type

Delivery Type	Letter Count
Content Analysis and Response Application Web portal	493
Carrier: USPS, UPS, FedEx, etc.	30,869
Email	2,411
Fax	1

Letter Type

The comments in response to the draft EIS were categorized based on the type of letter. The Flathead National Forest is keeping all letters that were received as part of the planning record.

Table 8-2. Letter Type

Letter Type	Letter Count
Unique	568
Form	33,112
Form Plus*	68
Master Form**	18

* Form plus refers to form letters with one or more additional unique and substantive comments.

** Master form letters are letters determined to be representative of a set of form letters.

Responding Organizations

A large number of organizations responded to the draft EIS. Table8- 3 provides a list of these organizations as well as the respective Content Analysis and Response Application letter number(s) and contact name listed on the letter.

If you are looking for the responses in this document to a particular letter from an organization, find the organization name and its letter number in table8- 3 and then go to the sections under Responses to Comments by Topic that cover the topics addressed in the letter. These topics are listed alphabetically. If you are reading an electronic copy of this document, you may also search by the letter number to find the responses.

Table8- 3 List of responding organizations and corresponding letter number(s) in the Content Analysis and Response Application (CARA)

Organization	Letter Number	Contact Name
Alliance for Wild Rockies	2762	Garrity, Michael
American Rivers	3098	Fiebig, Mike
American Whitewater	2839	Colburn, Kevin
Back Country Horsemen of the Flathead	3013, 3035	Hopkins, Ralph
Back Country Horsemen of Montana	3035	Pollman, Brad
Backcountry Hunters & Anglers of Montana	3035	Sullivan III, John B.
Bearclaw Powersports, LLC	2902	Dawson, Brian
Big Sky 4 Wheelers	2880	Settle, Steve
Bitterroot Backcountry Cyclists	291	Pyscher, Lance
Board of Commissioners, Flathead Co., MT	3050	Holmquist, Pamela J.
Board of Commissioners, Flathead Co., MT	3050	Mitchell, Philip B.
Board of Commissioners, Flathead Co., MT	3050	Krueger, Gary D.
Capital Trail Vehicle Association	51	Abelin, Doug
Center For Biological Diversity	2888	Santarsiere, Andrea
Center for Large Landscape Conservation	2875	Ament, Rob
Citizens For Balanced Use	3079	White, Kerry
Conservation Congress	110	Boggs, Denise
Dango Design	286	Goffman, Dan
Defenders Of Wildlife	2940	Nelson, Peter
F. H. Stoltze Land & Lumber Co.	2574	McKenzie, Paul
Fastoys	190	Fast, Beau
Fathead Fat Tires	3006	Bodman, Erin
Flathead Dirt Riders Assn.	2639	Wentzel, Jeff
Flathead Fat Tires	148	Windauer, Dave
Flathead Lakers	3094	Steinkraus, Robin
Flathead Trail Fairies	2843	Cron, Ron
Flathead Valley Chapter of Trout Unlimited	3035	Timchak, Larry
Flathead-Lolo-Bitterroot Citizens Task Force	2984	Bader, Mike
Flying Popcorn Ranch	2987, 3026	Kinsfogel, Kathy

Organization	Letter Number	Contact Name
Friends of the Bitterroot	2861	Miller, Jim
Friends Of The Clearwater	2901	Macfarlane, Gary
Friends Of The Wild Swan	290	Montgomery, Arlene
Glacier-Two Medicine Alliance	3005	Flint, Kendall
Great Burn Study Group	2808, 2829	Dupree, Beverly
Great Falls Bicycle Club	241	Juras, John
Great Northern Ranch, Llama Breeders & Packers Since 1979	223, 3035	Rolfing, Steve
Greater Yellowstone Coalition	306, 3133	Dunkley, Shana
Greater Yellowstone Coalition	3160	Simpkins, Mollie
Headwaters Montana, Inc.	108	Hadden, Dave
Headwaters Montana / Montana Wilderness Association	2819	Hadden, Dave
Idaho Conservation League	23	Smith, Brad
International Mountain Bicycling Association	2876	Melson, Eric
Lake City Trail Builders Association	221	Pjesky, David
Lake County Commissioners	3080	Barron, William D.
Lake County Conservation District	255	Simpson, Jim
Missoula Co. Community and Planning Svcs.	3085	O'Herren, Patrick
Montana Outfitters and Guides Association	2805	Minard, Mac
Montana Backcountry Alliance	311	Schmerker, Jeff
Montana Department of Natural Resources and Conservation	3122	Poncin, Greg
Montana Ecosystems Defense Council, Inc.	2765	Kelly, Steve
Montana Fish, Wildlife & Parks	2889	O'Neill, Deborah
Montana Fish, Wildlife & Parks	2985	Ivy, Nancy
Montana Fish, Wildlife & Parks	3087	Williams, Jim
Montana Logging Association	2832	Olson, Keith
Montana Mountain Bike Alliance	2874	Allen, Bob
Montana Native Plant Society	3009	Settvendemie, Kathy
Montana Pilots Association	2643	Smith, Pete
Montana Single Track Riders	2884	Retz, Kaleb
Montana Wilderness Association	2879	Robinson, Amy
Montanans for Multiple Use	2615, 2617	O'Neil, Jerry
Montanans for Multiple Use North Lincoln County Chapter	2631	Mattheis, Scott
National Parks Conservation Association	2816	Lundstrum, Sarah
Nine Mile Wildlife Workgroup	2809	Sweeney, Pat
Nordique Log Homes	3076	Donovan, Ken and Sherri
North Fork Preservation Association	2807	Powers, Debo
Polebridge Mercantile & Bakery LLC	305	Hammerquist, Will
Quiet Glacier Coalition	2856	McClelland, Mary
Recreational Aviation Foundation	316	Normandeau, Ronald

Organization	Letter Number	Contact Name
Recreational Aviation Foundation	333, 3083	Jarecki, Chuck
Recreational Aviation Foundation	2594	Newpower, Scott
Recreational Aviation Foundation	3073, 3083	McKenna, John
River Outfitter	3287	Kotler, Danielia
Rocky Mountain Elk Foundation	2580	Henning, Blake
Sierra Club	3000, 3021	Rice, Bonnie
Sierra Club	3020	Janczyn, David
Summit Sno-goers and Cut Bank Saddle Club	39, 242	Norman, Doug
Swan Mountain Outfitters	2847	Lorona, Aubrie
Swan Valley Fire Rescue	94	Swan Valley, Fire Rescue EMS
Swan View Coalition	13, 33, 34, 35, 38, 43, 44, 49, 73, 162, 298, 332, 2864	Hammer, Keith
Terrapin Farm	2783	Hellpern, Stuart
The Humane Society of the United States	324	Keefover, Wendy
The Lands Council	3084	Peterson, Mike
The Pew Charitable Trusts	177	Salmon, Marni
The Wilderness Society	2869	Reeves, Jordan
Trout Unlimited	2855	Fisher, Corey
U.S. Department of the Interior	141	Stewart, Robert F.
U.S. Environmental Protection Agency Region 8	2994	Vaughan, Molly
Western Montana Trail Riders Association	1	Merifield, James
Whitefish Legacy Partners	3061	Van Everen, Heidi
Whitefish Range Partnership	2801	Lundstrum, Sarah
WildEarth Guardians/Western Watersheds Project	2904	Dyson, Greg
WildEarth Guardians	2894	Nelson, Marla
Wildlands Defense	2821	Woodbury, Thomas
Wildlife Conservation Society	46	Weaver, John
Winter Wildlands Alliance	59	Eisen, Hilary

Organized Letter Campaign

An organized letter campaign is a set of form letters that have been identified as such based on overlapping content and comments.

Table 8-4 lists the Content Analysis and Response Application form set name, master form letter number, number of form letters per form set, quantity of form plus letters per form set, and then the total number. The total number is a summary of the form and form plus columns plus the master form letter. The form set numbers that are not assigned to an affiliated organization represent form letters from groups of commenters who did not indicate the organization they were affiliated with.

Table 8-4. Number of letters received from organized letter campaigns

Form Set Name	Master Form Letter Number	Number of Form Letters	Number of Form Plus* Letters	Total Number (Includes Master Letter)
Form Set 1: Flathead Fat Tires	126	53	15	69
Form Set 2: Montana Wilderness Association	11	8	3	11
Form Set 3: Sierra Club	3,020	21,023		21,024
Form Set 4: Swan View Coalition	15	28	3	33
Form Set 5:	100	21	3	25
Form Set 6:	249		1	2
Form Set 7:	2,925	16	25	42
Form Set 8:	194	4	2	7
Form Set 9:	225	1		2
Form Set 10:	2,596	2		3
Form Set 11:	2,610	1		2
Form Set 12:	62	1		2
Form Set 13: Greater Yellowstone Coalition	3,160	77	10	88
Form Set 14:	229	4	3	8
Form Set 15:	285	9		10
Form Set 16	187	2,305	0	2,306
Form Set 17: Recreational Aviation Foundation	2,594		4	5
Form Set 18: WildEarth Guardians	2,894	9,559		9,560

* Form plus letters are form letters with one or more additional unique and/or substantive comments.

Origins of Letters

Table 8-5 indicates how many letters were received from each state in the United States. Of the letters submitted with addresses, most were from Montana (a total of 533 out of 654 total letters, including unique, master form set letters, and form plus letters) that were entered into the Content Analysis and Response Application. The additional form letter information is kept as part of the planning record files.

Table 8-5. Origins of letters commenting on the draft EIS

State	Number of Letters
Arizona	4
California	26
Colorado	20
Connecticut	2
Florida	10
Georgia	1
Idaho	13
Illinois	7

State	Number of Letters
Maine	1
Maryland	3
Massachusetts	3
Michigan	2
Minnesota	9
Missouri	4
Montana	533
Nevada	1
New Hampshire	1
New Jersey	4
New Mexico	1
New York	5
North Carolina	3
Ohio	2
Oregon	3
Pennsylvania	2
Tennessee	1
Texas	1
Utah	3
Vermont	1
Virginia	2
Washington	12
Wyoming	5

List of Individual Commenters

The table below gives the names of individuals who submitted a letter regarding this project. The list is organized alphabetically by last name. Letters sent anonymously or sent with contact information that was not legible are not included in this list. Letters from commenters who indicated they were associated with a particular organization are included in the count in the organized letter campaign (see table 8-4). The last column contains the letter number that was assigned to each individual's letter.

If you are looking for the responses in this document to a particular letter from an individual, find the person's name and letter number in table 8-6 and then go to the sections under Responses to Comments by Topic that cover the topics addressed in the letter. These topics are listed alphabetically. If you are reading an electronic copy of this document, you may also search by the letter number to find the responses.

Table 8-6. List of Commenters

Last Name	First Name	Letter #
Abelin	Doug	51
Abolt	Russell	55
Adair	Dan	137
Allen	Bob	2874
Allen	Brett	275
Allen	Mark	259
Almquist	Marty	2601
Alrawi	Lorraine	3141
Altobelli	Rocco	222
Ament	Rob	2875
Andersen	Richard	3036
Anderson	Zack	2788
Anderson	Jocie	3008
Anderson	Rick	3130
Anderson	Thomas	322
Anderson	Doug	2634
Anderson	Eric	2897
Anderson	Kvande	3007
Anderson	Pauline	121
Anderson	Tom	3252
Andlauer	Carly	3271
Anon	Anon	3135
Anon	Anon	168
Anon	Sara	3138
Antonzcyk	Mike	96
Anttila	Tanjariitta	2925
Arno	Matt	2938
Artley	Dick	26
Ash	June	2835
Austin	Kyle	230
Bader	Mike	2984
Bagley	Rick	202
Bailey	James	3204
Bangeman	Johanna	3106
Banning	Ned	3012
Barge	Scott	288
Barinowski	Andrew	2891
Barker	Bob	199
Barnes	Matt	3269

Last Name	First Name	Letter #
Barron	William D.	3080
Bass	Rick	3064
Bates	Scott	7
Baughan	Tory	219
Beach	Lance	2793
Beale	Marty	2885
Beardslee	Gregory	189
Beardslee	Greg	3273
Beaupre	Jeff	3205
Behenna	Laura	238
Belcer	Durae	2647
Berro	Travis	2903
Blackler	Edd	16
Blank	D. L.	2610
Blaylock	Trudy	2624
Blazer	Andy	2596
Bleau	Justin	2637
Bodman	Erin	3006
Bodman	Noah	2887
Bodman	Erin	2629
Boggs	Denise	110
Boilen	Sara	2653
Bolin	Brock	193
Boman	Lee	20
Boman	Lee	3268
Boneski	Troy	194
Booker	Kayje	3136
Boots	Bryce	2628
Botkin	Steve	287
Boughton	Zack	2840
Bovard	Laura	2812
Boyd	James	293
Brake	Matt	310
Brandt	Ronald	2948
Brauch	Gregg	3127
Braun	Stephen	2996
Briggeman	Tomi	3142
Brown	Bob	257
Bruce	Molly and Larry	271
Brueggeman	Susan	297

Last Name	First Name	Letter #
Bruinsma	Jessica	2908
Brust	Mark	2579
Buentemeier	Ron	3024
Buhl	Timothy	116
Burbine	Andy	327
Burchfield	James	272
Burden	Sheri	42
Burgau	June	2767
Burgess	LT	3045
Burkhalter	Alex	104
Burris	Kirk	2827
Busby III	Arthur E.	2999
Butler	Arthur	3034
Cameron-Russell	Sally	28
Campbell	Cate	128
Carlson	Anne	3100
Carlson	Ashley	3301
Carlson	Jeff	2883
Carlson	Landon	2789
Carter	John	163
Case	Troy	2914
Chamberlin	Wayne	3139
Chapman	Louann and Paul	246
Childs	Mike	2998
Clark	Diane	3185
Colavito	Dave	245
Colburn	Kevin	2839
Colgan	Warwick	317
Conley	Owen	10, 256
Connelly	Chris	2853
Constantinides	Patrick	29
Coolidge	Del and Linda	3147
Corah	Chad	76
Corder	Rush	198, 3091
Cossitt	Jim	2911
Courts	Ian	3202
Cox	Valerie	3040
Cox	Ron	2939
Coyote	Ramona	2657

Last Name	First Name	Letter #
Cron	Ron	2843
Croskrey	Jen	92
Cuthbertson	Jon	197
Dahl	Anne	2649
Danley	Tom	50
Davis	Richard	3001
Dawson	Brian	2902
de Kort	Linda	2646
Delagnes	Jon	2616
Delaney	Katherine	249
Denton	Jeffrey	3155
DeVos	Tim	86
Dierickx	Patrick	3089
Dieterich	Michele	282
Dominguez	Angel	3031
Donovan	Ken and Sherri	3076
Down	Shut	3102
Downing	Jessica	80
Dugan	Leon	232
Duley	Amanda	208
Dunkley	Shana	306, 3133
Dupree	Beverly	2808, 2829
Durham	Rebecca	3263, 3296
Dyson	Greg	2904
Edwards	Carol	3289, 900
Edwards	Paul	15
Eisen	Hilary	59
Ellis	Steve	2917
Ellison	Julie	3128
Enk	Michael	2613
Epperson	Robert	237
Erickson	Char	3257
Ericson	Diann	2995
Erslev	Brett	126
Feldt	Courtney	192, 2794
Feldt	Paul	2592
Ferguson	Rick	40, 247
Ferrell	Doug	4, 3265
Fiebig	Mike	3098
Fields	Edwin	2777, 3104

Last Name	First Name	Letter #
Fisher	Corey	2855
Fitzsimmons	Bill Evans and Pat	3041
Fitzsimon	Thomas and Mary	95
Fletcher	Steve	2890
Fletcher	Susan	3146
Flint	Kendall	3005
Florey	Carlos	75
Foran	Bobbi	329
Forder	Dwayne and Pamela	3068
Forkum	Aleta	3294
Fortune	Julie	225
Foster	Lynn	2815
Foster	Mike	2818
Foster	Aaron and Shannon	2771
Foster	Ian	2778
Frank	Brian	2895
Franke	Wyatt	224, 3108
Franklin	Richmond	3264
Freese	Lisanne	3213
French	Dane	206
Freyholtz	Gary	31, 3054
Freyholtz	James	2949
Fullerton	Laurel	82
Futrell	Sherrill	326
Gansaner	Diane	22
Gansauer	Grete	3116
Garrick	Jay	2575
Garrity	Michael	2762
Gates	Bob	3095
Gazzo	Paul	3159
Gembala	Ryan	235
George	Bret	2831
Gestring	Bonnie	11
Gill	John C. and Polly A.	3148
Gniadek	Steve	3042
Goetting	jay	2636
Goffman	Dan	286
Good Monod	Stormy	315

Last Name	First Name	Letter #
Gordon	Randal	3077
Graham	Jeffrey	3067
Grant	Charles	258
Gratch	Alan and Sallie	268
Gray	Glen	3010
Greenough	Elda L.	3114
Gregerson	Reed	2877
Gregg	Mike	2796
Gressle	Sharon	3016
Grewflower	Judith	3298
Grossman	Jessie	3060
Grove	Phil	3029
Gullickson	Marla	81
Gunderson	Kari	2632
Guynn	Peter and Carolyn	201, 3028
H	Amy	3030
Hadd	Tom	3254
Hadden	Dave	108, 2819, 2823
Hall	Jake	2826
Hall	Susan	164
Hallman	John	3259
Hamblin	Patrick	240
Hamilton	Pamela	3015
Hammer	Keith	13, 33, 34, 35, 38, 43, 44, 49, 73, 162, 298, 332, 2864
Hammerquist	Will	305
Handschin	Walt	2784
Hansen	Dan	3279
Hansen	Daniel	2907
Hanson	Deborah	3188
Hanson	Mark	250
Harmon	Dani	2627
Harmon	Josh	2625
Harris	Jalene	231
Hartwig	Airn	139
Hassett	Locke	99
Hastings	Darryl	56
Haug	Catherine	2852

Last Name	First Name	Letter #
Haugen	Kyle	2942
Hayes	Linda	3214
Hefferman	Kathy	2768
Heidle	Eric	3297
Hein	Laurie	3215
Hellman	John	3267
Hellpern	Stuart	2783
Hendrickson	Marc	71
Henning	Blake	2580
Herling	Daphne	3048
Hernandez	Freddy	83
Hertig	Joe	3276
Higgins	B	3038
Hildner	Suzanne	3051
Hildner	Richard	3037
Hill	Rusty	2941
Holder	Betty	2
Holland	Steve	253
Holliday	Joel	278
Holloway	Matt	2844
Holloway	Corrie	2946
Holmquist	Pamela J.	3050
Hopkins	Ralph	3013, 3035
Hoppes	Tyler	284
Hough	Jeff	320
Hudson	Hank	3120
Hunt	Leslie	84
Irestone	Charles	2630
Ivy	Nancy	2985
Jacks	Kevin	2619
Jacobson	Donny	2581
Jaeger	Lowell	3026
Janczyn	David	3020
Janover	Sally	2892
Jarecki	Chuck	301, 333, 3046, 3083
Jennings	Gerry	143
Johnson	Andrew	2871
Johnson	Dale	2583
Juras	John	241
Jutte	Roger	3262

Last Name	First Name	Letter #
Kanter	Britt	87
Kantor	Isaac	2814
Kantor	Mike	2828
Keefover	Wendy	324
Keily	Judith	2773
Kelly	Michael	309
Kelly	Steve	2765
Kendall	Aidan C.	3134
Kenyon Harrison	Randy and Donna	3032
Kieran	Molly Montan	2781
Kingsolver	Keith	292
Kinsfogl	Kathy	2987, 3062
Kiphart	Ridlon	72
Kiser	Katherine Stacy	3156
Klein	Cissy	2846
Klingsporn	Dr. Charles	3181
Kloetzel	Steven	2786
Knight	Jeremy	2919
Koehnke	Bill	3151
Kohrt	Rem	262
Kolb	Jill	3283
Konsella	Frank	150
Kopec	Len	142, 3280
Kotler	Danielia	102, 3287
Kratachwill	Dale	3047
Krogstad	Steve and Marianne	57
Krueger	Joshua	2906
Krueger	Gary D.	3050
Kuhl	Richard	2790
Lake	Kevin	285
Lakes	Beverly	2650
Lakes	Mike	2648
Lamar	Luke	3081
Lamar	Sharon	54
Lamar	Steve	2591
Lambeth	Larry	186
Lamson	Russ	90
Langenderfer	Mary	252
Larson	John	270

Last Name	First Name	Letter #
Lauderdale	Jacob	2798
Lazarowski	Garold	62
Lazarus	Marianne	2761
LeBlanc	Katie	2860
Lenzner	Shawn	2635
Light	Sarah	2602
Lind	Gregar	3158
Linne	Gail	2651
Littfin	Jeff	211
Little	Jed	2882
Lohmeyer	Max	178
Lonn	Jeff	214
Loomis	Jody	2858
Loomis	Ashton	2870
Lorona	Erik	2851
Lorona	Aubrie	2847
Luedke	Ruth	3065, 3293
Luedke	Bret	3057, 3292
Luhman	Dale	3097
Lundstrum	Sarah	2801, 2816
Lyman	Jamie	2854
Macfarlane	Gary	2901
Malone	Laura	3124
Mann	Marty	313
Marshall	Roger	2842
Martin	Drew	3288
Martin	Jeremiah	2656
Marx	Addrien	53
Marynowski	Ian	299
Mason	Chuck	2654
Mattheis	Scott	2631
Matthew	Jonathan	8
Mauritzen	Clayton	328
Mazzullo	Patricia	2924
Mazzullo	Sonny	3266
McAdams	Heather	2943
McCabe	Anna	296
McClelland	Mary	2841, 2856
McCoy	Abe	3286
McDonnell	Patrick	307
McGrew	Mike	319

Last Name	First Name	Letter #
McKenna	John	3073, 3083
McKenzie	Paul	2574
McKnight	Deva	3059, 3281
McMackin	Jason	2803
McMillen	Mac	3220
McNeil	Alan	2881
McQueary	MK	3093
Meeks	Mark	3227
Melson	Eric	2873, 2876
Menkens	Randy	3111
Mergler	Jeffrey	321
Merifield	James	1, 2772
Messenger	Cheri	3291
Metsky	Jeff	2652
Metzmaker	Jan and Pete	2640
Meyer	Neil and Dixie	3011
Meyers	Lynn	3137
Michaelpourl	Michaelpourl	3258
Middlesworth	Tary	3078
Miester	Mary	3272
Miller	Jim	2861
Miller	Linda	2604
Miller	Zachary Stephen	3126
Miller	Chris	2578
Milner	Gary	304
Minard	Mac	2805
Mitchell	Philip B.	3050
Montgomery	Arlene	290
Morrow	Brent	36
Mosteller	Rosella	3261
Motz	Jenifer	153
Mowbray	Carmine	2792
Muhs	Ted	3290
Nagel	Clinton	2836
Neel	Hannah	2849
Nelson	Peter	2940
Nelson	Marla	2894
Nelson	Ray	2916
Nelson Ballsrud	James and Nancy	2988
Nelsor	Whitley	3140

Last Name	First Name	Letter #
Neudecker	Ryen	2775
Newpower	Scott	2594
Nielsen	Mike	3277
Norman	Doug	39, 242
Normandeau	Ronald	316
Norton	Rebecca	3033
Nostrant	Brian	274
Nyght	Dakota	100
O'Brien	Marc	330
O'Brien	Kelly	2899
Oconnoe	Roy	2770
O'Herren	Patrick	3085
Olch	Karen	3002
Oliver	Adam	156
Olsen	Lance	179, 180, 181, 182, 183, 184, 185
Olson	Keith	2832
O'Neil	Jerry	2615, 2617
O'Neill	Deborah	2889
Orr	Taylor	3145
Parker	Marvin and Louise	3149
Parker	Tom	3035
Parks	Brian	2989
Parodi	Margaret	3101
Parsons	Jen	3069
Parsons	Ben	3123
Patrick	Nic	3232
Perkins	Casey	3300
Peterson	Mike	3084
Peterson	Jody	3260
Petrillo	Tom	2820
Pfund	Mike	2633
Phillips	William	203
Pittman	Linda	3129
Pollman	Brad	3035
Pomerleau	Adam	2620
Poncin	Greg	3122
Potter	Charles	191
Potter	Rachel	233
Potter	Howard K.	3117

Last Name	First Name	Letter #
Powers	Debo	2807, 3014
Presson	Lane	146
Public	Jean	27
Publiee	Jean	12
Pullman	Clint	70
Putnam	Brian	2837
Pysher	Lance	291
Quinn	Jim	3075
Quiram	Walker	2612
Radlowski	Matt	2896, 3274
Raible	Matt	9
Rawls	Mike	2912
Rawls	Francesca	2909
Redding	Matt	2950
Reed	James	2915
Reed	Tony	5
Reed	Anthony	6
Reeves	Jordan	2869
Reeves	Karen	2900
Refsnider	Kurt	2641
Reichert	Chris	3152
Reinhard	Anne	3017
Reinsel	Mark	160
Repke	John	3003
Retz	Kaleb	2884
Rice	Bonnie	3000, 3021
Richardson	Bruce	3043
Richardson	Ryan	2833
Richeson	Norman	2573
River	Mark	195
Rivera	Henry	2937
Roberts	Gret	3282
Robinson	Amy	2879
Rocke	Eva	3285
Rockwell	David	213
Rolfing	Steve	223, 3035, 3109
Root	Gary	3153
Rose	Heather	318
Rosengren	Kay C.	3150
Rowlands	Suzanne	3052

Last Name	First Name	Letter #
Ruch	John	2817
Runyan	Jeff	3299
Rutherford	Jay	2872
Ryan	Chris	2606
Sadler	Morgan	2593
Salmon	Marni	177
Santarsiere	Andrea	2888
Sauer	Greg	3072
Savage	Craig	2905
Savik	Lon	3092
Scharfe	Kyle	325
Scharfe	Colleen and Don	3110
Schatz	Greg	3004
Schletz	Joe	159
Schmerker	Jeff	227, 311
Schmidt	Joan	3071
Schott	Brian	3113
Schuda	Roxanne	2922
Schule	Beth and Travis	105
Schutt	Terry	3115
Sebby	Karl	97
Sedlock	Michael	2626
Serra	Dawn	187
Settle	Steve	2880
Settvendemie	Kathy	3009
Shaeffer-Smith	Candace and Doug	264
Shafer	Min	2921
Shehan	Joel	2642
Shelley	Mike	2605
Sherman	Michael	65
Sherman	Roger	21
Sherman	Rick	3131
Shiffman	William	58
Sigrist	Ellen	323, 2983
Silliman	Lee and Nance	2769
Simpkins	Mollie	3160
Simpson	Edward and Beatrice	3194
Simpson	Jim	255

Last Name	First Name	Letter #
Skinner	Shawn	2878
Skogley	Robert	2811
Slagle	Lisa	2923
Smith	Brad	23
Smith	Brian	2577
Smith	Jeff	2576
Smith	Roger	152
Smith	Jeff	117
Smith	Pete	2643
Smith	Catherine	3119
Snyder	Elaine	3157
Snyders	Steve	2893
Sobin	Cory	67
Sohl	Edward	2776
Spencer	Preston	2638
Spencer	Cathy	3270
Steed	Amber	48
Stegmaier	John	2800
Steinkraus	Robin	3094
Steinmuller	Patti	2614
Stewart	Robert F.	141
Stewart Family	Stewart Family	3044
Strong	Debra	2813
Suk	Thomas	234
Sullivan	Stephen	2609
Sullivan III	John B.	3035
Sundquist	Sandy	3249
Sunshine	Stephanie	216
Sweeney	Pat	2809
Tabor	Patrick	2799
Tague	Diana L.	3049
Tapp	John and Marcia	91
Taylor	Janis	3063
Taylor	Steve	196
Taylor	Brad	2857
Taylor	George	3143
Thomas	Howard and Loretta	3074
Thomas	Jon	218
Thompson	Kirk	266

Last Name	First Name	Letter #
Thompson	Steve	2865
Thompson Wright	Roger and Katie	3053
Thorsrud	Claudia	2589
Thorsrud	Lloyd	2588
Timchak	Larry	3035
Tobolski	Matt	188
Todd	Cully	78
Todd Townsend	Charity	3099
Trufant	Seth	279
Tucker	David	85
Tudor	Nancy	3088
Tudor	Roy	3125
Turk	Lawrence	2586
Ulev	Elana	2766
Ulrichsen	Kevin, Beth, Sarah and Erik	3284
Usahanun	Mrs. Waltraud	3255
Van Everen	Heidi	3061
Vaughan	Molly	2994
Vaughn	Brian	2587
Verboven	April	47
Vernon	Suzanne	2830
Vignere	Joel	2603
Von Maur	Denison	3278
Wade	Frances	229
Wagner	Peg	3027
Wagner	Doug and Peg	331
Wagner	Doug	3025
Wakefield	Todd	2621
Warren	Greg	217
Warrington	Melissa	2918
Watson	Eileen	2910
Weaver	John	46
Webber III	Owen B.	3154
Weitzel	Brett	2867
Wells	George	151
Welzenbach	Corinna	2824
Wentzel	Jeff	2639
White	Edna	2920

Last Name	First Name	Letter #
White	Kerry	3079
Willett	James Alan	2779
Williams	Jim	3087
Williams	Richard	52
Williamson	Warren	3055
Willison	Pam	2622
Wilson	Daniel	2585
Windauer	Dave	148
Windbigler	Steve	37
Wolfe	Gary	200
Wolfe	Gary and Rita	3070
Wolff	Marilyn	3
Wood	Cody	2936
Woodbury	Thomas	2821
Woods	James	312
Worthington	Alex	74
Wuerthner	George	14, 109

Public Concern Areas

As the comments were analyzed, they were grouped into public concern areas and given general titles summarizing the common concern of the comments in the group. The table below lists the public concern areas that were developed for this project. Analysis of the comments was done in phases to allow for quick review by Forest resource specialists. The first phase was giving titles to each group of comments; the second phase was further grouping or splitting of the response areas; the third phase was writing the public concern statements; and the fourth phase was writing the responses to the concerns.

The majority of the comments received were focused on the Flathead National Forest's draft forest plan. In this appendix, all comments and responses that refer to "the Forest" are referring to the Flathead National Forest. Note that the draft EIS considered alternatives A through D for the Flathead National Forest's forest plan. Comments under concern titles that begin with Grizzly Bear Conservation Strategy or Grizzly Bear were at least in part directed at the amendment forests (volume 3 of the draft EIS). Additionally, comments that refer to the "amendments" or "amendment Forests" or alternatives 1-3 are related to the portions of the Kootenai, Lolo, and Lewis and Clark-Helena National Forests located in the NCDE.

Table 8-7 Areas of public concern and associated letter numbers

Concern Title	Associated Letters
Access—General	37, 70, 196, 275, 330, 2595, 2628, 2776, 2827, 2887, 2921, 3008, 3122
Access—Roads	37, 39, 331, 2632, 2649, 2905, 2998, 3054, 3070
Access—Seniors and Disabled	51, 329, 2772, 2880, 2908, 2949, 2995, 3137, 3291
Access—Trails	89, 2620, 2853, 2867, 2890, 2895, 2902, 2914, 3077, 3123
Adaptive Management	290, 2765, 2805
Administrative Areas	3097
Air Quality—General	2994
Air Quality—Smoke Impacts	2994
Airstrips—Current and Future Direction	217, 301, 316, 2598, 2788, 2792, 2901, 3046, 3073
Airstrips—Wilderness Encroachment	333, 2643, 2792, 3083, 3097
Alternative A	37, 3077, 3091, 3110
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Responses to Comments by Topic

Access

Access—General

Comment (letter numbers 37, 70, 196, 275, 330, 2595, 2628, 2776, 2827, 2887, 2921, 3008, 3122)

1. The Forest should keep access to Federal lands open and available for multiple uses.
2. The Forest should continue to provide reasonable access to State trust lands as guaranteed under the Alaska National Interest Lands Conservation Act.
3. The Forest should continue to make it a high priority to partner with the State to acquire permanent access under the master cost-share agreement or the easement exchange process.

Response

1. The Forest considered access to the Forest for a variety of uses, including timber harvest, motorized and nonmotorized use, and mechanized transport (e.g., bicycles). The alternatives provide for a variety of uses and access, with some alternatives providing more access for management and mechanized transport or motorized use and others providing less access. See the sections on environmental consequences under sections 3.10 and 3.21 in the final EIS for disclosure of these effects. Alternative D provides the most access for management and mechanized transport or motorized use and alternative C the least access. The decisionmaker carefully considered a range of management area allocations, suitability determinations, and recreation opportunity spectrum classes to determine the mix of land and resource uses that would best meet public needs. The suitability determination and management area allocation and the resultant opportunities for timber management and mechanized or motorized recreation under alternative B modified reflect the desired proportion of land uses for the Flathead National Forest, with consideration of the analysis of the alternatives and public comments.
2. The Forest follows all applicable laws and regulations. The Forest will continue to provide reasonable access under the Alaska National Interest Lands Conservation Act.
3. The priority for easement work is determined by the annual lands budget and program management. This is outside the scope of the forest plan revision.

Access—Roads

Comment (letter numbers 37, 39, 331, 2632, 2649, 2905, 2998, 3054, 3070)

The Forest should provide more open roads and increased access. The Forest should not allow additional open roads, and certain roads should be closed.

Response

The forest plan does not make any decision on opening or closing specific roads. It does make decisions on management area allocations and suitability of uses. See the response to Access—General, item 1.

Access—Seniors and Disabled

Comment (letter numbers 51, 329, 2772, 2880, 2908, 2949, 2995, 3137, 3291)

The Forest should provide more motorized and mechanized trails for seniors, disabled people, retirees, and veterans; it is important to provide adequate multi-use trails to encourage all groups of people to get outside to recreate. Some roads should be open for travel by elderly and disabled individuals but not by four-wheelers.

The Forest should improve accessibility to the Forest with wheelchair-accessible trails and plug-ins for their vehicles.

Response

The Forest did consider mechanized and/or motorized opportunities for a variety of purposes, including providing access for seniors and people with disabilities. The alternatives provide for a variety of recreation opportunities, with some alternatives providing less and others more opportunities for mechanized transport or motorized use. See the Environmental Consequences section of section 3.10 (Sustainable Recreation and Access) in the final EIS for disclosure of these effects. See also the responses to comments under Access—General.

The designation of trails as multi-use is decided at the project level and is outside the scope of the forest plan revision. The development of trails for wheelchair use and the provision of plug-ins for vehicles at developed recreation sites is also a project-level decision and outside the scope of this forest plan revision.

Access—Trails

Comment (letter numbers 89, 2620, 2853, 2867, 2890, 2895, 2902, 2914, 3077, 3123)

The Forest should maintain the current amount of trails and add additional trails to the network.

The Forest should not close Alpine Trail #7 to mountain biking.

Response

Alternative B modified includes plan components to add additional trails to the trail system. See FW-DC-IFS-04, 06, 08, 09, and 11; GA-SM-DC-02 and GA-SM-OBJ-01.

Alpine Trail #7 is not within recommended wilderness in the forest plan; there is no change to the current allowable use of this trail.

Adaptive Management

Comment (letter numbers 290, 2765, 2805)

The Forest's approach should be less prescriptive and more descriptive in the forest plan to enable the agency to adapt to changes in biological circumstances. It makes more sense that the public and the agency should be able to adapt to these changes in the most effective manner possible.

The forest plan revisions should use adaptive management to correct mistaken assumptions in the 1986 forest plan based on effects and monitoring. The forest plan abandons amendment 19, INFISH, amendment 21, management area allocations for riparian areas, and big game winter range, as well as others. Appendix C to the forest plan doesn't even consider alternative A (the

current forest plan) in its potential management approaches and possible actions, as if it doesn't exist and cannot be selected. Neither the draft forest plan nor the draft EIS acknowledge, address, or alleviate the problems that monitoring has uncovered in the current forest plan. These are serious flaws that must be corrected.

Adaptive management as described in the draft EIS abandons essential management standards contained in the 1986 forest plan that applied to aquatic ecosystem function, watershed health, native fish protection, aquatic ecosystem restoration, connectivity, and species viability. Adaptive management cannot possibly succeed without a fully funded monitoring program. What assurance can the Forest Service now make to reverse this historic pattern of monitoring neglect?

Response: Information from past monitoring was used to inform the assessment of the Flathead National Forest (USDA, 2014a), which informed the need for change. As stated in the purpose and need section 1.4 of the final EIS: "To develop the proposed action to revise the forest plan, the management direction in the 1986 forest plan and its amendments was reviewed. The 2012 planning rule requirements also mandate that new management direction be developed to address sustainability. This section summarizes how needs for change identified in the 1986 forest plan and its amendments, specifically those related to areas of public concern, were addressed during the development of the forest plan.

The results of past monitoring of aquatic ecosystem function, watershed health, native fish protection, aquatic ecosystem restoration, and connectivity on the Flathead National Forest were used to inform the development of plan components. For example, page 17 of the assessment (USDA, 2014a) explains that monitoring of aquatic conditions within the plan area as used to inform the watershed condition framework, using 12 watershed condition indicators to categorize subwatersheds and develop the rankings for each of the assessment factors in the framework. Sources of data used to assess trends include forest plan monitoring, surveys, PIBO monitoring, and project effectiveness monitoring. Monitoring of Montana forestry best management practices was also used in the assessment and to inform the development of plan components.

A section entitled adaptive management (see the introduction to chapter 5, Monitoring Program, in the forest plan) includes a discussion of how the Forest is following adaptive management principles outlined in the planning rule directives (Forest Service Handbook 1909.12, zero code 06.1 and 06.2). An excerpt from this section demonstrates the adaptive management approach: "For example, monitoring item MON-TE&V-01 would be used to assess the change in key ecosystem characteristics for forest and non-forest vegetation at the scale of the biophysical setting, as well as forestwide. Using adaptive management principals, recently re-measured Forest Inventory and Analysis data informed the development of management direction in the forest plan and will assist the Forest in determining if adjustments to management direction are needed in the future. For example, Forest Inventory and Analysis data was used to assess the trend in the amount of old-growth forest, determining the amount burned by wildfire since the last Forest Inventory and Analysis measurements were completed. In light of this monitoring information, the forest plan has added plan components that place more emphasis on management for key ecosystem characteristics of old-growth forest, such as live trees and snags in the 20 inch d.b.h. class."

Administrative Areas

Comment (letter number 3097)

The Flathead should include additional areas in the management area 3a administrative site designation. In addition, administrative use of the Upper Big Bill administrative trailhead should not occur because it conflicts with bear security and wilderness values.

The list of administrative sites has missing sites and/or incorrect names.

Response

Changes in the status of sites and their categories will occur through site-specific analysis, if deemed appropriate and necessary. The Upper Big Bill administrative trailhead falls into this category. Administrative sites are only assigned to management area 3a if a plan component is necessary to address an issue for the site.

Condon Airstrip is now included in the administrative site listing. The list is updated to reflect the correct name for Schafer Meadows Airstrip.

Air Quality

Air Quality—General

Comment (letter number 2994)

The Forest Service should provide trends in air quality and air quality-related values for the identified Class I and II areas, as well as PM10 data (data on particulate matter smaller in diameter than 10 micrometers) for the nonattainment areas.

Response

Section 3.9 on air quality in the final EIS has been modified by the addition of data from the Interagency Monitoring of Protected Visual Environments (IMPROVE) system from two sites located in Class I areas: the Monture guard station on the Lolo National Forest and sites in Glacier National Park (see <http://vista.cira.colostate.edu/Improve/>) which represent conditions in the wilderness areas of the Flathead National Forest.

Data from the PM-10 nonattainment areas are provided in section 3.9 on air quality in the final EIS. The Kalispell nonattainment area was established primarily because of road dust issues related to residual sand on roads after the winter, according to the Montana Department of Environmental Quality.

The draft EIS incorrectly identified Kalispell as a designated carbon monoxide nonattainment area. It was never officially designated, according to the Montana Department of Environmental Quality, and this has been dropped from the final EIS.

Air Quality—Smoke Impacts

Comment (letter number 2994)

The Forest Service should include a qualitative discussion of pollutants typically emitted by fire to include potential impacts to existing conditions and duration of the impacts.

Response

The final EIS (see section 3.9) includes some details related to pollutants from fire.

Airstrips

Airstrips—Current and Future Direction

Comment (letter numbers 217, 301, 316, 2598, 2788, 2792, 2901, 3046, 3073)

1. The Forest should add the following for the Schafer Meadows airstrip Airstrip to the plan: There is a ninety-percent probability of having no more than a total of 5 aircraft landings per day. And commercial air service permitted use is managed to ensure that there is no more than an average of 5 commercial aircraft landings in any consecutive seven-day period.
2. The Forest should add the following objectives to the plan: Consider dispersed recreational sites that could accommodate aircraft access for various recreational activities—sites that have limited access due to long road distances or no other means of accessing the site.
3. The Forest should provide direction or consideration, to future planners, for the utilization of airstrips as a method for dispersing recreation opportunities, as an alternative to road construction for recreation and administrative access, or as a way to provide forest access points, i.e., trailheads, at locations other than at road terminuses.
4. The Forest should protect existing airstrips from closure and should open previously closed airstrips.
5. The Forest should not allow the possibility of new airstrips on the Flathead National Forest as this use caters to a specific special interest, especially when it involves considerable development and the dedication of a large area to a single use.

Response

Alternative B modified does not include additional language regarding Schafer Meadows Airstrip.

Alternative B modified does not include an objective to consider dispersed recreation for aircraft access, nor does it provide direction or consideration of the utilization of airstrips as a method for dispersing recreation opportunities, an alternative to road construction for recreation and administrative access, or as a way to provide Forest access points. Alternative B modified does include suitability plan components for management areas 6b and 6c. These areas are suitable for new airstrip development in desired recreation opportunity spectrum class semiprimitive motorized and roaded natural.

Alternative B modified does have desired conditions regarding airstrips on the Forest:

FW-DC-IFS-143: Existing airstrips on NFS lands (Condon, Meadow Creek, Spotted Bear, Schafer Meadows) are maintained to provide for quality recreational opportunities and administrative needs.

GA-SF-DC-03: The Spotted Bear and Meadow Creek Airstrips provide public and administrative access for small aircraft.

FW-DC-REC-04: Recreation facilities, including toilets, cabins, trailheads, river portals, airstrips, developed campgrounds, and visitor centers, are maintained to standard to protect Forest resources, provide safe access, and provide visitor experiences commensurate with the recreation opportunity spectrum setting. Visitors are very satisfied with the facilities and services on the Forest.

Airstrips—Wilderness Encroachment

Comment (letter numbers 333, 2643, 2792, 3083, 3097)

The Forest should not have a wilderness or recommended wilderness boundary within 5 miles of airstrips (i.e., the Ryan and McClure private airstrips) because pilots, when approaching and departing airstrips, should not have to have their attention diverted due to concern about overflying wilderness boundaries placed in close proximity to the airstrip.

Response

Alternative B modified does not include recommended wilderness boundary within 5 miles of the Ryan and McClure airstrips (located on private land). The forest plan does not change the administrative boundaries of congressionally designated wilderness. Ryan Field is within 1.5 miles of the Great Bear Wilderness and McClure Airstrip is 2.5 miles from the Great Bear Wilderness. The Great Bear Wilderness is a congressionally designated wilderness.

The Federal Aviation Agency regulates airspace, and pilots are requested to maintain a minimum altitude of 2,000 feet above the surface of the following: national parks, monuments, seashores, lakeshores, recreation areas, and scenic riverways administered by the National Park Service;; national wildlife refuges, big game refuges, game ranges, and wildlife ranges administered by the U.S. Fish and Wildlife Service;; and wilderness and primitive areas administered by the U.S. Forest Service (from Aeronautical Information Manual 7-4-6: Flights Over Charted U.S. Wildlife Refuges, Parks, and Forest Service Areas). The Federal Aviation Agency requests this of pilots, but it is not a prohibition.

Alternatives

Alternative A

Comment (letter numbers 37, 3077, 3091, 3110)

- The Forest should adopt alternative A because the current plan is the least restrictive to motorized use; even so, it still includes recommended wilderness that should not be wilderness.
- The Forest should maintain the current 98,388 acres of recommended wilderness.

Response

Thank you for expressing your views on alternative A, which reflects the 1986 forest plan, as amended, and accounts for current laws and regulations. Substantial changes have occurred in conditions and demands since the Flathead National Forest's 1986 forest plan. The 2012 planning rule, which became effective May 9, 2012, requires the inclusion of plan components, including standards or guidelines, that address social and economic sustainability, ecosystem services, and multiple uses integrated with the plan components for ecological sustainability and species diversity.

Alternative A is not the least restrictive to motorized use (refer to comments and responses in Access—General, and in Recreation—Motorized Use, as well as to the final EIS section 3.102 under Access).

As the no-action alternative, alternative A does not propose any changes to what was recommended as wilderness in the 1986 forest plan (98,446 acres). The 2012 planning rule

required the Forest Service to identify and evaluate lands that may be suitable for inclusion in the National Wilderness Preservation System and to determine whether to recommend any such lands for wilderness designation. Additional information about the process can be found at www.fs.usda.gov/goto/flathead/fpr (click on the “Wilderness Inventory and Evaluation” link), and also refer to appendix 4 of the final EIS for the wilderness recommendation process.

Alternative B

Comment (letter numbers 46, 80, 108, 156, 177, 327, 2580, 2826, 2869, 2874, 2876, 2878, 2940, 2948, 3021)

The Forest should adopt alternative B for the following reasons:

- It provides a balanced use of the Forest.
- It is a fair blend of recommended wilderness, recreation access, and timber interests and represents a reasonable compromise that protects the most interests.
- It allows for a balance between protecting the area and allowing access.
- It promotes active management and also addresses most of the habitat needs for the Forest’s large variety of wildlife.

The Forest should adopt alternative B, with the following suggested changes or modifications or requests for clarification:

- Volume 1 of the draft EIS, p. 25, says, “It would maintain baseline conditions for motorized road access across the Forest which have supported recovery of the grizzly bear, but would not require additional closure of roads and trails open to public motorized vehicle use” and “Existing or slightly reduced levels of motorized road access could be expected.” These statements about alternative B need to be reconciled. Are there plan components that would reduce motorized access or not?
- Motorized and mechanized recreational uses and other uses that reduce an area’s wilderness character and potential are not allowed in recommended wilderness areas.
- An additional 1,608 acres should be added to Tuchuck-Whale recommended wilderness area.
- An additional 75,000 acres of the most important areas should be recommended for wilderness designation.
- Vital areas on the Flathead National Forest do not receive adequate or lasting protection in alternative B. The Forest should more strongly protect the most important remaining roadless areas in accordance with the national significance of this landscape. These additions (specified by the commenter) focus on headwater areas that will provide for greater resilience during climate changes.

The Forest should not adopt alternative B because

- It is a poor resource management choice . . . approximately half of alternative B’s timber harvest acres would be located within inventoried roadless areas that should be afforded stronger protection, especially headwater areas that will provide for greater resilience during climate changes.

Response

Thank you for expressing your views on alternative B. All views were carefully considered during development and evaluation of the alternatives in the forest plan process. Alternative B modified has been selected as the preferred alternative.

Alternative B modified includes 190,403 acres of recommended wilderness. The following recommended wilderness areas are in the selected alternative: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale. The areas recommended in alternative B modified are an appropriate assortment of land uses for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

The forest plan has the following plan component (MA1b-SUIT-06) for management area 1b (recommended wilderness): “Mechanized transport and motorized uses are not suitable in recommended wilderness areas.” This plan component was adopted for alternative B modified because this programmatic plan component will serve to guide the future management of the areas being recommended for wilderness and will protect and maintain the ecological and social characteristics that provide the basis for wilderness recommendation. It is important to note that this plan is a programmatic plan and site specific decisions are needed to make progress towards many of the desired conditions and objectives found throughout the plan. This suitability determination for mechanized transport and motorized use is the appropriate first step in ensuring the protection and maintenance of these areas. The areas being recommended for wilderness do not currently have extensive mechanized transport or motorized use (they have 344 acres of motorized over-snow vehicle use).

Under alternative B modified, additional road closures would not be required for grizzly bears but two objectives that would decommission additional roads or place them into intermittent stored service are included, one forestwide (FW-OBJ-IFS-01) and one specific to the Swan Valley geographic area (GA-SV-OBJ-04). For example, GA-SV-OBJ-04 would decommission or place into intermittent stored service 10 to 30 miles of roads. The priority would be roads causing resource damage in priority watersheds, roads on acquired lands in the Swan Valley that are not needed for fire protection or other resource management, and/or roads that are within desired nonmotorized recreation opportunity spectrum settings and/or roads that are within bull trout watersheds.

As described in the final EIS (section 3.16.3), in alternative B modified, inventoried roadless areas are comprised of approximately 37 percent recommended wilderness, 55 percent backcountry management areas, 3 percent designated and eligible wild and scenic rivers, 2 percent research natural areas, and 4 percent general forest management area 6a, none of which are suitable for timber production. However, low levels of timber harvest for multiple-use purposes could occur, as well as salvage logging and timber harvest to achieve desired conditions in management areas 2a, 2b, 3b, 4a, 5a through d, and 6a. Another key aspect of the mix of uses allowed in the various management areas associated with alternative B modified as well as other alternatives is that the Forest approximately 45 percent of the Forest is in designated wilderness. These acres and the social, economic, and ecological values they represent and provide for are important considerations in making a land-use decision that is a foundational requirement of the National Forest Management Act.

Alternative C—Forest Products

Comment (letter numbers 15, 44, 54, 2649, 3047)

The Forest should select alternative C as it has the right amount of lands suitable for timber production and level of timber management, especially within the Swan River valley bottom.

Response

Thank you for expressing your views on timber management under alternative C. This alternative was considered by the responsible official when making his decision on the selected alternative and the forest plan.

Alternative C—General

Comment (letter numbers 14, 33, 42, 46, 192, 194, 201, 211, 290, 328, 329, 2574, 2592, 2622, 2632, 2762, 2832, 2835, 2841, 2846, 2861, 2904, 2910, 2984, 2998, 3020, 3021, 3062, 3070, 3097, 3272)

The Forest should adopt alternative C for the following reasons.

- Alternative C offers the most protection to grizzly bears and other wildlife and is the strongest proposed alternative in regard to the Forest Service's conservation mandate.
- It protects the vast majority of remaining roadless areas in the Flathead National Forest by recommending them for wilderness designation and by prohibiting mountain bikes and motorized vehicles in recommended wilderness areas. Under alternative C, grizzly bears would receive higher levels of protection because no "temporary" public motorized access would be allowed in secure grizzly habitat and no surface mining or drilling would be allowed in the primary conservation areas or adjacent lands.
- Alternative C would protect the vast majority of remaining roadless areas in the Flathead National Forest by recommending them for wilderness designation, and prohibit mountain bikes and motorized vehicles in recommended wilderness areas. Under alternative C, grizzly bears would receive higher levels of protection because no "temporary" public motorized access would be allowed in secure grizzly habitat and no surface mining or drilling would be allowed in the primary conservation areas or adjacent lands. The Forest should take this opportunity to generate widespread, healthy policies for grizzly habitat, health, and recovery in the NCDE and choose alternative C with the above modifications as the final plan.

It does the best job of conserving and perpetuating the forest characteristics and values that attract people to the Swan Valley.

- Alternative C best meets the 2012 planning rule provisions under Sustainability 36 CFR 219.8(a) Ecological sustainability (1) Ecosystem Integrity. The plan must include plan components, including standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity, taking into account (i-vi), including stressors such as climate change.

Response

The Forest recognizes that there are many different ideas and opinions on how the Forest should be managed and how the assortment of multiple uses of the Forest should be applied across the landscape. The final EIS considers a broad range of alternatives that emphasize different uses that may be conflicting, such as one that includes more backcountry and recommended wilderness management area allocations (alternative C) and others that include less, or one that includes

more lands that are suitable for higher levels of timber production (alternatives A or D) and others that include less. All alternatives recognize that vegetation management, including timber harvest, is an important tool to help achieve the desired conditions specified in the forest plan, including ecological (e.g., wildlife habitat, forest resilience) and social and economic (e.g., providing wood products and employment). The decision will strive to set an appropriate mix for the Flathead National Forest in consideration of the wilderness evaluation (see appendix 4), the alternative analyses, and public comments. Alternative B modified has been selected as the preferred alternative. The preferred alternative (B modified) does include more recommended wilderness than alternative B.

The forest plan includes plan components designed to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity, taking into account stressors such as climate change. Refer to final EIS appendices 2, 3, and 7 for more details on consideration of climate change.

Alternative B modified does not allow temporary public motorized access in grizzly bear secure core. Alternative B modified has a no surface occupancy stipulation in the primary conservation area. In addition, alternative B modified includes numerous plan components to maintain or restore vegetation structure, function, composition, and connectivity, as discussed in detail in sections 3.3 and 3.7 of the final EIS.

Under alternative B modified, plan component MA1b-SUIT-06 states that mechanized transport and motorized use are not suitable in recommended wilderness areas. The decisionmaker carefully considered the desired conditions and how this plan component would help the Forest achieve the desired conditions for recommended wilderness, would serve to guide the future management of the areas being recommended for wilderness, and would protect and maintain the ecological and social characteristics that provide the basis for wilderness recommendation. The areas being recommended for wilderness do not currently have extensive mechanized transport use or motorized use in them (there are currently 344 acres of motorized over-snow vehicle use). See also the comments and responses under the following areas of concern: Alternatives—Range of Alternatives, Alternative C—With Modifications.

Alternative C—Recommended Wilderness

Comment (letter numbers 54, 238, 2602, 2610, 2761, 2814, 2844, 2987, 2989, 3081, 3116)

The Forest should choose alternative C because of the need for more recommended wilderness.

The Forest should not choose alternative C because there is enough wilderness on the Forest.

Response

The decisionmaker carefully considered a range of recommended wilderness areas from 506,905 acres in alternative C to no acres in alternative D, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas recommended in the draft decision (190,403 acres) are an appropriate mix for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments. The forest plan includes 190,403 acres of recommended wilderness. The following areas were recommended as wilderness under alternative B modified: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale.

Alternative C—With Modifications

Comment (letter numbers 33, 217, 290, 2888, 2901, 2904, 3021)

The Forest should adopt alternative C due to the following benefits: the recommended wilderness allocations (notably, the alternative includes 98 percent of inventoried areas within recommended wilderness inventory), restrictions on mechanized use in recommended wilderness, the least amount of backcountry acreage for motorized over-snow vehicle use, and the placement of 79 percent of the general forest management areas in the low- and moderate-intensity vegetation management categories (management areas 6a and 6b), enhancing vital habitat protections.

The Forest should refine and modify alternative C, as follows: combine alternative C with alternative A to provide the grizzly bear security (by adding the current forest plan's amendment 19 road density requirements and grizzly bear standards); add INFISH standards and riparian management objectives; add an evaluation of NRLMD direction; include riparian and big game thermal and snow intercept management area allocations in this alternative to make it a true conservation alternative; reduce timber production (harvest on over 700,000 acres of the Forest will harm and completely remove habitat for some wildlife in those areas); add measureable and quantifiable standards; and evaluate alternative C in the context of the Forest's unique roles and contributions.

“Even the adoption of Alternatives C and 3 would not meet the legal standards the Flathead and the other NCDE forests are obligated to follow.”

Response

Thank you for expressing your views on alternative C and your suggested modifications to this alternative. All views were carefully considered during the development and evaluation of the alternatives in the forest plan revision process.

The decisionmaker has the ability to select portions of alternative A, including INFISH standards, amendment 19 requirements, riparian management objectives, riparian and big game thermal and snow intercept management area allocations, or areas suitable for timber production in combination with any of the other action alternatives, including alternative C. The decisionmaker carefully considered a range of alternatives, including recommended wilderness areas as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas recommended in this decision are an appropriate mix for the Flathead National Forest in consideration of the Forest's unique role and contributions, wilderness evaluation, alternative analyses, and public comments.

Analyses in the final EIS showed that all alternatives meet the legal standards the Flathead and the other NCDE national forests are obligated to follow. As stated in the final EIS, the available information documents increases in grizzly bear distribution, population size, and genetic diversity (Costello, Mace, & Roberts, 2016; Kendall et al., 2009). Habitat conditions and management actions on the national forests have contributed importantly to the increasing population size and distribution of the grizzly bear across the NCDE. But, supporting a healthy, recovered grizzly population through time will depend on the Forest Service's continued effective management of the NCDE grizzly bear habitat. This will be accomplished by measureable and quantifiable standards, as discussed in the final EIS, the biological assessments for the Flathead National Forest (Kuennen, Van Eimeren, & Trechsel, 2017) and the amendment forests (Warren, Van Eimeren, & Trechsel, 2017), and the USFWS biological opinions (USFWS, 2017a, 2017b).

These biological assessments and biological opinions are available on the Flathead National Forest's forest plan revision website (www.fs.usda.gov/goto/flathead/fpr).

As discussed and displayed in the Forest Products—Timber section of the draft EIS and final EIS (section 3.21), the Forest has an estimated 308,200 acres of lands suited for timber production under alternative C, and these lands are where the majority of timber harvest would occur. Timber harvest is allowable on 429,200 additional areas under alternative C, as stated in volume 2, p. 112, of the draft EIS and also in the final EIS in table 152, but these additional areas are not considered suited for timber production because timber production is not compatible with the desired conditions and objectives established by the forest plan. Opportunities for harvest within these additional areas would be limited as they are largely unroaded; increasing the access to and management intensity of these lands would have to be consistent with the desired conditions, standards, and guidelines for all resources.

Refer to section 1.4.3 of the final EIS for a discussion of the need to update the original INFISH standards and riparian management objectives. Under INFISH, riparian habitat conservation areas were designated around all bodies of water. These areas, renamed riparian management zones in the forest plan, are wider than the riparian habitat conservation areas under INFISH. Along mapped wetlands, ponds, and lakes, the width of the riparian management zone is 300 feet (regardless of the size of the waterbody), and along intermittent streams the width is 100 feet on all streams instead of the existing 50 feet on some streams. This change will help ensure the Forest is consistent with Montana streamside management zone law. Although the riparian management zones are not a separate management area, the forestwide management direction will protect the riparian management zones throughout the Forest.

With the action alternatives, there are no management area allocations specific to deer or elk. Instead, big game or ungulate snow intercept cover is addressed by forestwide guideline FW-GDL-WL DIV-01. Desired conditions for potential vegetation types and geographic areas also address winter habitat for these species. Steep open areas providing elk and mule deer winter habitat are generally mapped as management area 6a (general forest low-intensity vegetation management, which are areas not suitable for timber production) (see section 3.7.4, subsection "Forest Ungulates" for more details).

NRLMD management direction is evaluated in section 3.7.5 of the EIS. The NRLMD was reviewed and is included as appendix A of the forest plan, with two Forest-specific modifications to guideline HU G11 and standard VEG S6 (see EIS section 3.7.5, Canada lynx, for details). Additional plan components in alternative B modified also promote lynx conservation, as discussed in the USFWS biological opinion (USFWS, 2017b).

Alternative D

Comment (letter numbers 37, 193, 198, 199, 224, 240, 286, 313, 2574, 2832, 2902, 2949, 3017, 3021, 3050, 3108)

The Forest should adopt alternative D because it would allow the most options for community members and the growing population to interact with the National Forest System lands on the Flathead National Forest. Commenters noted the following benefits of alternative D:

- the inclusion of significant areas designated as management area 6c (general forest high-intensity vegetation management) in the Swan Valley, Hungry Horse, Middle Fork, South Fork, and Salish Mountains geographic areas;

- the more broad designation of suitable timberlands across the landscape;
- the broader use of management area 7 (focused recreation areas), specifically in the Island Unit and the Salish Mountains area; and
- the retention of winter motorized recreation opportunities in both the Sullivan Creek area of the South Fork geographic area and the areas identified in the Whitefish Range Partnership recommendation for the North Fork geographic area.

Alternative D should be modified to include all the recommendations of the Whitefish Range Partnership, specifically

- the elimination of management area 6c designations in the North Fork geographic area by changing all management area 6c to the 6b classification, which is still suitable timber base but would have lower-intensity management to fully reflect the other resource values;
- the designation of recommended wilderness in the Whale-Trail-Tuchuck area as presented in the Whitefish Range Partnership proposal;
- the modification of the general management area 7 (focused recreation areas) designation on the south end of the North Fork geographic area and east side of the Salish Mountains geographic area to more accurately delineate between frontcountry non-commercial uses and the higher level of development associated with Whitefish Mountain Resort; and
- the expansion of winter motorized recreation opportunities in the south end of the North Fork geographic area.

Figure 9 (p. 1-78 of the draft EIS) projects intermediate and regeneration harvest for alternative D. However, NEPA does not permit unequal treatment of alternatives.

The Forest should not adopt alternative D because it would fracture landscape connectivity, imperil water quality and riparian areas, isolate and threaten old-growth forests, and thereby make protection of threatened and endangered species nearly impossible. As with alternative B, approximately half of alternative D's 508,000 "harvest" acres would occur in inventoried roadless areas and would likely violate the 2001 Roadless Area Conservation Rule.

Substantial land use designation comments were submitted at the time of the proposed action, and the Forest should reconsider those comments in making its decisions. Those site-specific comments have not changed nor are they all reflected in any one of the alternatives.

Response

Thank you for expressing your views of alternative D. Although alternative D was not selected as the preferred alternative, important components of this alternative were incorporated into the preferred alternative, B modified. As commenters noted, alternative D does not have any recommended wilderness and provides the highest level of timber production that is sustainable while meeting resource protection requirements. The Forest recognizes the importance of timber production to the economic and social sustainability of the community. Alternative B modified incorporates elements of alternative D to this end, with similar allocation of land to management area 6c (general forest high-intensity vegetation management). Alternative B modified also largely reflects the recommendations from the Whitefish Range Partnership for management of the North Fork geographic area and incorporates all of the focused recreation areas in alternative D (forestwide). Alternative B modified includes forestwide plan components that promote

landscape connectivity, protect water quality and riparian areas, and are designed to maintain or restore old-growth forests.

In the draft EIS, figure 9 was used solely for the purposes of discussing cumulative effects to soils under reasonably foreseeable future actions. Future timber harvest is approximated through a modeling process (see sections 3.21 and appendix 2 of the final EIS). Alternative D was used in this exercise because it had the highest management intensity. Effects to soils related to past and projected timber harvest has been updated in the final EIS. The discussion of effects to soils related to past and future timber harvest activities has been updated. The section on soils environmental consequences (section 3.2.7) references table 18 and table 19 (past harvest and projected future harvest, respectively) to analyze these effects.

Under alternative D, the majority (89 percent) of the inventoried roadless areas are in management area 5 (backcountry), with lesser amounts in management areas 2a and b (designated wild and scenic rivers), 3b (special areas), 4a (research natural areas), and 6a (general forest low-intensity vegetation management). As stated in the final EIS, in management areas 2a, 2b, 3b, 4a, 5a, 5b, 5c, 5d, and 6a, timber harvest is expected to be limited and generally would be done for purposes that would result in retaining the natural integrity of the ecosystem. Timber harvesting that is done to reduce hazardous fuels may be more intensive and change the undeveloped characteristics, to some degree, until vegetation regrows. This is most likely to happen on the edges of a roadless area near communities. Any timber harvesting within these areas would meet the requirements of the 2001 Roadless Area Conservation Rule.

All comments were reviewed and considered in the design of the alternatives, including site-specific comments that were helpful in informing the decisionmaker on the appropriate programmatic direction.

Alternatives—Airstrips

Comment (letter number 2594)

The Forest should have plan components that allow the possibility of new airstrips to access remote recreation opportunities in future travel and recreation planning.

Response

Alternative B modified does include suitability plan components for management areas 6b and 6c. These areas are suitable for new airstrip development in desired recreation opportunity spectrum class semiprimitive motorized and roaded natural. See also the comments and responses under Airstrips—Current and Future Direction.

Alternative B modified does have desired conditions regarding airstrips on the Forest:

FW-DC-IFS-14: Existing airstrips on NFS lands (Condon, Meadow Creek, Spotted Bear, Schafer Meadows) are maintained to provide for quality recreational opportunities and administrative needs.

GA-SF-DC-03: The Spotted Bear and Meadow Creek Airstrips provide public and administrative access for small aircraft.

FW-DC-REC-04: Recreation facilities, including toilets, cabins, trailheads, river portals, airstrips, developed campgrounds, and visitor centers, are maintained to standard to

protect Forest resources, provide safe access, and provide visitor experiences commensurate with the recreation opportunity spectrum setting. Visitors are very satisfied with the facilities and services on the Forest.

Alternatives B and D—Without Additional Recommended Wilderness

Comment (letter numbers 33, 92, 99, 105, 192, 194, 198, 231, 310, 317, 321, 322, 330, 2574, 2578, 2585, 2592, 2602, 2622, 2635, 2853, 2858, 2870, 2871, 2882, 2887, 2891, 2897, 2909, 2914, 2923, 2940, 3069)

The Forest should adopt alternative B or alternative D, either keeping the recommended wilderness level at that proposed in alternative B or not including any recommended wilderness, and the Forest should continue to allow multiple uses (motorized and nonmotorized) on Alpine Trail #7 and its various feeder trails.

The Forest should not adopt alternative B or alternative D because they support excessive motorized recreation and logging in areas previously protected and because they are premised on removing Endangered Species Act protection from grizzly bears, relaxing habitat protections, and adding “industrial-strength recreation” (in part via focused recreation areas, including Krause Basin) to “industrial-strength logging.”

Response

Thank you for your comments on alternative B and/or alternative D. The alternatives presented in the final EIS provided a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The Forest also recognized the advantages of blending certain elements of the different alternatives in response to public comments.

Alternative B modified has recommended wilderness management area allocations similar to those proposed in alternative B but with additions and reductions as recommended through public involvement. Alternative D has no recommended wilderness and thus provides a level of recommended wilderness less than under alternative A, the current plan.

Alternative B modified would provide the opportunity for multiple uses, including public wheeled motor vehicle use, on about 1,431 miles of designated NFS roads on the Forest. Motorized over-snow vehicle use would be suitable on 31 percent of the Forest, and mechanized transport (e.g., mountain bikes) would be suitable on 52 percent of the Forest. Management area allocations for alternative B modified or D do not change the use of the Alpine Trail #7.

Alternative B modified includes all of the focused recreation areas that were identified in alternative D. The Flathead Valley and surrounding areas continue to experience high population growth and development. With the increasing numbers of recreationists, the Forest faces the task of managing the land in a way that offers a wide spectrum of opportunities while minimizing conflict between different uses and minimizing the effects on the environment. The desired condition for these focused recreation areas, under plan component MA7-DC-01, is: “Focused recreational opportunities are provided in specific areas in response to increasing demand. Local communities can readily access these areas for a variety of motorized and nonmotorized experiences.” Specific desired conditions and other plan components for individual focused recreation areas are found in the geographic area sections of the forest plan, and these sections contain information on how these areas will be managed.

Refer also to the comments and responses under Alternatives—Grizzly Bear and Grizzly Bear Conservation Strategy—Range of Alternatives.

Alternatives—Blend of All Alternatives

Comment (letter numbers 17, 44, 2799, 2879, 2900, 3072, 3087)

The Forest should adopt a blend of the alternatives:

- Blend alternatives B and C to allow for more recommended wilderness because of the growing human population and to ensure the diversity and strength of wildlife populations.
- Adopt recommended wilderness in the Skyline area, as outlined in John Weaver’s past recommendations.
- In addition to the grizzly bear management programs that should and must be carried forward from alternative A into the action alternatives, there are other dovetailed programs to protect water quality and fish. Some of these programs should be merged with the best aspects of alternative C to follow through on promises made in the current forest plan.

Response

Thank you for your support of a blend of alternatives. The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The Forest recognizes the advantages of blending certain elements of the different alternatives. In response to public comments, alternative B modified has been selected as the preferred alternative, and it includes components of alternatives A, C, and D. See also the responses to comments under Alternatives—Grizzly Bear and Aquatics—Forest Plan Components.

The preferred alternative (B modified) does include more recommended wilderness than alternative B, including in the Skyline area. Alternative B modified has eight areas totaling 190,403 acres that are recommended for inclusion in the National Wilderness Preservation System. This alternative includes a plan component that states that mechanized transport and motorized use are not suitable in recommended wilderness areas.

Alternatives—General

Comment (letter numbers 73, 2790, 2910, 2940, 3079)

There is no comparison of effects of alternatives in chapter 2. That is a critical omission that hinders the public review process and violates NEPA.

The action alternatives all represent risky, uncharted territory not based on the best available science. None of the alternatives represent the requisite forest plan revision based on a rational response to the conditions found through forest plan monitoring and evaluation.

The alternatives listed in the draft EIS all seem tilted one way or the other. The Forest should allocate about 288,000 acres to wilderness, including areas in the North Fork and the Bunker-Upper Sullivan Creek areas of the Swan Range north to Jewel Basin.

Alternative C, by proposing all remaining inventoried roadless areas on the Flathead National Forest for recommended wilderness designation, goes a long way toward protecting the Forest’s precious wildlands and wildlife.

Despite recognizing the effects of roads on aquatic ecosystems, the draft EIS does not address the fact that there would be different amounts of roads and open roads under each alternative. This kind of “analysis” is wholly inadequate to meet NEPA’s requirement to provide information about the effects of alternatives.

40 CFR 1507.2 requires agencies to study, develop, and describe alternatives to recommend courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources. The agency has failed to comply with this requirement.

The alternatives provided reflect an arbitrary designation of recommended wilderness area acreage and location without any specialist reports that analyze the eligibility of these areas for wilderness. Suitability studies have not been completed on these areas; arbitrary lines have only been drawn on a map for people to comment on without any documentation of whether these areas would qualify.

The Forest Service did not include an alternative that would increase the amount of timber harvest available, even though it acknowledges that this industry is an important economic driver of local communities.

Response

The Forest recognizes that there are many different ideas and opinions on how the Forest should be managed and how the range of multiple uses of the Forest should be applied across the landscape. The EIS considered a broad range of alternatives that emphasized different combinations of uses, such as one that included more backcountry and recommended wilderness areas (alternative C) and one that included more lands that are suitable for higher levels of timber production (alternative D). All alternatives recognized that vegetation management, including timber harvest, is an important tool to help achieve forest plan desired conditions, including ecological (i.e., wildlife habitat, forest resilience) and social and economic (i.e., providing wood products and employment) benefits. See section 3.2.8, subsection “Effects on water quality and quantity from motorized trails, travel management, and roads,” in the final EIS, which addresses the relationship of roads and aquatic ecosystems by alternative. The responsible official considered all points of view and the desire a combination of multiple land uses for the Forest. A summary comparison of effects by alternatives has been included in the final EIS.

The 2012 planning rule requires the responsible official to use the best available scientific information to inform the development of the plan, including plan components, the monitoring program, and plan decisions. The foundation from which the plan components were developed for the forest plan was the expertise of planning team members who have considerable experience from working on the Flathead National Forest for the past 30 years. This interdisciplinary team of resource professionals compiled and evaluated the relevant information for the assessment of the Flathead National Forest (USDA, 2014a), the draft EIS, and the final EIS, including the best available scientific information and analyses therein. The resource specialists considered what is most accurate, reliable, and relevant in their use of the best available scientific information. The best available scientific information includes the publications listed in the reference sections of the Flathead’s assessment and draft EIS, as well as additional information that was used in the final EIS and the planning record exhibits prior to the record of decision. The reference sections of these documents also include opposing scientific information.

The plan monitoring program (chapter 5 of the forest plan) addresses the most critical components for informed management of the Forest’s resources within the financial and technical

capability of the agency. Every monitoring question links to one or more desired conditions, objectives, standards, or guidelines. However, not every plan component has a corresponding monitoring question. In addition, project and activity monitoring may be used to gather information for the plan monitoring program if it will provide relevant information to inform adaptive management.

The recommended wilderness evaluation followed chapter 70 of the planning directives (USDA, 2012) and carefully considered the inventoried areas, and the decisionmaker has made a reasoned decision on which areas to recommend under alternative B modified. It is also important to note that areas that did not meet the criteria to be included in the initial inventory were not carried through the evaluation process. All areas that were included in the inventory were evaluated (see appendix 4 of the final EIS). See also the responses to comments under Alternative C—Recommended Wilderness.

Under alternative D, the Forest evaluated a feasible alternative that represented an increase in timber harvest and areas available for mechanized treatment. Aspects of this alternative were included in alternative B modified, most notably the allocation of areas within the wildland-urban interface in the Swan Valley to management area 6c. It is also important to note that the selected alternative represents what is considered feasible to implement given the other resource values that must be considered when planning and implementing a timber sale program.

Alternatives—Grizzly Bear

Comment (letter numbers 15, 108, 282, 297, 900, 2622, 2816, 2879, 2889, 2904, 2940, 3005, 3021, 3160)

Many commenters expressed support for alternative 3 (amendment forests) and/or alternative C (Flathead National Forest) because they provide greater habitat security and connectivity for the grizzly bear. One supported alternative 2 with additions. Others commented that the Forest Service should combine alternatives A and C, modify Flathead National Forest management area 6 under alternative 3, and manage zone 2 on the Helena National Forest as a genetic connectivity area.

Response

One commenter expressed support for alternative 2 (alternative B) with the addition of plan components NCDE- KNF Zone 1-DC-02, NCDE-HNF Zone 1&2-DC-02, and NCDE-LNF Zone 1-DC-02 from alternative 3 to better provide for occupancy and connectivity to other ecosystems while still managing for other wildlife species and multiple uses by the public. In response, these desired conditions were incorporated into alternative 2 modified in the final EIS.

Both the no-action alternatives 1 and A and the action alternatives 3 and C are considered in detail in the final EIS. The alternatives are meant to represent a range of possible management options from which to evaluate the comparative merits and respond to the significant issues. The responsible official could select either alternative, or any combination of alternatives, as the selected action. This could include a combination of alternatives 1 and 3 or A and C. Refer also to the comments and responses under Alternatives—Blend of All Alternatives, Grizzly Bear—Habitat Security and Grizzly Bear—Road Density and Security Core Habitat.

One comment suggested modifying the manner in which management area 6 is laid out under alternative C to address significant problems related to connectivity, particularly in the North Fork, Swan Valley, Hungry Horse, and Salish Mountains geographic areas. The Forest is unsure

what “significant problems for connectivity” is referring to. Alternative C includes the most acreage in management area 6a, laid out in a manner specifically designed to contribute to connectivity in key areas identified in the North Fork, Swan Valley, Hungry Horse, and Salish Mountains geographic areas. Refer also to the comments and responses under Wildlife—Modeling and Managing Connectivity and Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest.

Regarding a comment suggesting eliminating the provision allowing temporary public access for activities like firewood gathering from all alternatives, refer to the comments and responses under Grizzly Bear—Road Density and Security Core Habitat.

Regarding the suggestion to manage zone 2 as a genetic connectivity area and provide improved habitat protection for grizzly bears, refer to the comments and responses under Grizzly Bear Conservation Strategy—Helena National Forest Amendment.

Regarding comments that the EIS must consider the effects on the population as a whole and should have included the Beaverhead-Deerlodge National Forest, refer to the comments and responses under Grizzly Bear—Protection, Grizzly Bear Conservation Strategy—Helena National Forest Amendment, and Grizzly Bear Conservation Strategy—NEPA Process.

Alternatives—New Alternatives

Comment (letter numbers 91, 94, 108, 153, 293, 2574, 2940, 3007, 3021, 3076, 3079)

The Forest should consider options E and ER, presented at the Swan Valley Community Council meeting, which represent a better choice and direction for the Swan Valley community.

In the Salish Mountains geographic area in the Salish Divide zone, the Flathead National Forest should designate all existing unroaded areas—however small—as nonmotorized to protect the wildlife corridor offered by the Salish Divide. No alternative offers this.

The Forest should have developed a fourth alternative that attempted to balance the varied points of view and incorporated some of the willingness to compromise that was expressed in the public process instead of the standard “low–medium–high” options.

The Forest should “build a full spectrum Alternative around the Citizen reVision 2014, authored by Swan View Coalition and Friends of the Wild Swan, and supported by over a hundred individuals and organizations including Sierra Club.”

The Forest Service has failed to provide the public with an alternative that complies with Executive Order 12898 by addressing minority and low-income populations. The Forest recognizes the planning area is moving from a resource-based economy to service industry and tourism but fails to recognize its obligation to expand facilities such as campgrounds and recreation areas for these tourism-related opportunities. The Forest Service should provide an alternative that offers an expansion of camping and access facilities.

Response

The alternatives considered in the final EIS reflect the varied points of view expressed during the public process, ranging from the points of view of individuals who wanted no additional wilderness (alternative D) to those who wanted as much recommended wilderness as possible

(alternative C). Alternative B modified was developed to reflect input the Forest received in comments and during the collaborative process.

The Forest considered the proposal from Swan Valley residents with “option E to maximize the area of land available for adaptive management and to maximize the amount of land available for multiple fuel mitigation strategies” as well as option ER, which has a similar approach to option E but provides new management area direction for dispersed recreation. The issues identified in this comment are largely included in the design of alternative D, so a specific alternative reflecting this proposal was not developed in detail. Alternative B was modified in response to comments from residents in the Swan Valley. Specifically, recommended wilderness boundaries were adjusted in this alternative, and much of the valley bottom lands in the Swan that are within the wildland-urban interface were allocated to management area 6c.

The Forest considered the comment about maintaining the wildlife corridor along the Salish Divide (see section 2.4.6, subsection “Alternatives considered but eliminated from detailed study,” in the final EIS). Delineating subunits and applying 19-19-68 motorized access percentages to zone 1 was addressed in alternatives considered but eliminated from detailed study; see the final EIS, section 2.4.6 subsection “Primary conservation area and zone 1 should have the same motorized route standards.” In the Salish Mountains geographic area, standard GA-SM-STD-01 restricts densities of motorized routes open to public use and GA-SM-DC-05 and guideline GA-SM-GDL-01 address elk habitat security areas at least 250 acres in size and at least 0.5 mile from an open road. The Salish Divide area was also considered as management area 6a (general forest low-intensity vegetation management, not suitable for timber production) under alternative C. The importance of connectivity for wildlife is addressed in the final EIS in section 3.7.6. Also see comments and responses under Grizzly Bear Conservation Strategy—Range of Alternatives.

The Citizen reVision 2014 Wildlands Recovery Plan is addressed under alternatives considered but eliminated from detailed study; see the final EIS, section 2.4.6, subsection “Add alternative prepared by Citizen reVision.” However, Citizen reVision core components and recommendations were considered and addressed in the forest plan and its alternatives. For example, roadless lands recommendations were addressed by alternative C. Alternative A has management direction to attain 19-19-68 percentages or amended standards in each grizzly bear subunit and also includes INFISH management direction relative to Citizen reVision’s native fish and water quality recommendations. For soils, forestwide standard FW-STD-SOIL-01 addresses detrimental soil disturbance. Monitoring item MON-SOIL-01 addresses surveys of harvest units and percent of disturbance that meet the soil quality standard post-harvest. Additionally, the forestwide desired conditions consider core components identified by the Citizen reVision proposal. FW-DC-WTR-02 addresses stream connectivity; FW-DC-WTR-04 through 08 and 10 address temperature, large woody material, percent pools, residual pool depth, median particle size, percent fines, and shoreline, bank, and bottom configuration, all with respect to reference conditions and the natural range of variation. Objectives FW-OBJ-WTR-01 through 04 address restoration. Forestwide standard FW-STD-TE&V-01 protects old-growth forest and incorporates criteria in Green et al. (2011). Desired conditions FW-DC-TE&V-10, 11, 12 and 14 address the desire to maintain or increase the area and/or density of the very large live tree component and foster an increasing trend in the amount, patch size, and connectivity of old-growth forest into the future. Desired condition FW-DC-WL DIV 01 specifically addresses key ecosystem characteristics for fisher, described in the final EIS, section 3.7.4, fisher, affected environment. Key ecosystem characteristics would be provided by implementation of coarse-filter plan components for riparian management zones, old growth, and coniferous forests, as detailed in the

final EIS, section 3.7.4, subsection “Old-growth forests, very large live tree habitat, and very large dead tree habitat” and in section 3.3. For lynx and snowshoe hares, FW-DC-TE&V-19 and forest plan appendix A address horizontal cover and mature multistory forests. In addition to individual species discussions, the final EIS, section 3.7.6 summarizes how the alternatives address habitat connectivity and linkage. The following geographic area desired conditions provide emphasis on connectivity, incorporating the Salish demographic connectivity area and putative travel corridors identified by Squires and others (2013): GA-HH-DC-03, GA-MF-DC-04, GA-NF-DC-06, GA-NF-DC-07, GA-SM-DC-01 and 03, GA-SV-DC-09. In the portion of the Forest in the grizzly bear recovery zone/primary conservation area, grizzly bear secure core would provide areas for elk security that are at least 2,500 acres in size. Desired conditions for fire as an ecosystem process is addressed by FW-DC-TE&V-23 through 25 and by FW-DC-FIRE-03 and 04. FW-DC-TE&V-20 through 22 address insects and disease. Consideration of wildlife habitat during salvage harvest is addressed by desired conditions FW-DC-TIMB-05 and FW-GDL-TIMB-01 through 03. Guidelines FW-GDL-WL-04, FW-GDL-WL DIV-04, guideline FW-GDL-E&M-01, and standard FW-STD-E&M-06 address the use of helicopters and listed terrestrial species. Activities involving recurring helicopter use are considered to be a project for purposes of the application of grizzly bear standard FW-STD-IFS-03 (see glossary: project in NCDE, recurring helicopter use). Issues raised are addressed in multiple sections of the final EIS analysis of alternatives.

The Forest followed the 2012 planning rule when developing the action alternatives, all of which support ecological, social, and economic sustainability as a goal for the management of NFS lands and are inclusive of minority and low-income segments of the population. Proposed management direction provides people and communities with a range of social and economic benefits for present and future generations. The benefit to people (i.e., the goods and services provided) are the ecosystem services from the ecosystem. The Forest’s key ecosystem services, as discussed and identified in the assessment, are carbon sequestration and climate regulation; forest products such as wood products and huckleberries; water quality and quantity and flood control; clean air; outdoor recreation; scenery; fish and wildlife, i.e., habitat for these species; cultural and heritage values, inspiration, spiritual values and solitude; hunting, trapping, fishing, and wildlife viewing; and research and education.

Because all of the alternatives include management direction that addresses sustainable recreation and access, having a specific alternative focused on recreation was not developed. The Forest included focused recreation areas (management area 7) in the forest plan, and specific management direction for these areas is detailed in chapter 4 of the final EIS under geographic area direction.

Alternatives—Non Support, Without Rationale

Comment (letter numbers 37, 230, 288, 2620, 2789, 2826, 2838, 2891, 2909, 2941, 3127)

The Forest should not adopt alternative B, C, and/or D. No rationale was provided by the commentors.

Response

Thank you for expressing your views on the alternatives. All views were taken into consideration during the development, evaluation, and selection of the preferred alternative, B modified.

Alternatives—Preferred Alternative

Comment (letter numbers 59, 2574, 2631, 2805, 2940, 2994)

The Forest should have developed a preferred alternative for the public to comment on for the following reasons:

- The Forest should not develop a significantly different decision alternative without giving the public any effective opportunity to have input. The Forest should plan to accommodate substantial objection to the decision simply because there will be no other alternative for involvement. The Forest should consider providing another opportunity for public comment once the draft decision is developed that is not bound by the “cumbersome objection process.”
- The statement that the decision selected may be different than any of those presented would make it impossible for participants to fully understand and then comment on the infinite combinations of the proposed alternatives.

Response

The Forest Service did not identify a preferred alternative at the time of the draft EIS simply because it did not have a clearly identified preferred alternative. Through a careful consideration of the comments received, a preferred alternative (alternative B modified) has been identified that is within the range of alternatives analyzed in the draft EIS.

The objection process gives an individual or entity the opportunity for an independent Forest Service review and resolution of issues before the approval of the plan revision, building on early participation and collaboration efforts and with the intention of resolving concerns before a decision is made.

The responsible official considered all points of view and the desire for an appropriate mix of uses for the Flathead National Forest in making his decision. The preferred alternative identified in the final EIS is alternative B modified. The preferred alternative is based on the detailed proposed action that was published with the notice of intent in March 2015, with modifications in response to comments and refinements of the management area mapping. Alternative B modified is the result of robust public engagement efforts since 2013 and responds to the identified purpose for a revised, integrated set of plan direction consistent with the 2012 planning rule.

Alternatives—Pro Motorized Recreation

Comment (letter number 51)

The draft EIS is lacking in the following ways:

- The draft EIS lacks a reasonable alternative that addresses the public’s need for more motorized access and more motorized recreational opportunities.
- A pro-recreation alternative is viable and needed by the public. Motorized recreationists are the majority of the visitors to the Forest. There is a great need for motorized access and off-highway vehicle recreational opportunities. A pro-recreation alternative would provide additional motorized recreational opportunities in order to meet current and future needs.

In addition, the draft EIS

- lacks a reasonable alternative to address the need for motorized access and motorized recreation for youth;
- lacks a reasonable alternative to address the need for motorized access and motorized recreation for the elderly and disabled;
- fails to adequately address the impacts and benefits of motorized recreation on the human environment;
- overrepresents the public's need for more wilderness;
- improperly considers roadless areas;
- does not adequately consider the cumulative impact of all motorized closures;
- fails to address the requirements of Continental Divide National Scenic Trail laws and past illegal actions;
- fails to adequately identify and address the imbalance of trail opportunities in the Forest;
- does not provide for a reasonable level of multiple use;
- uses climate change unreasonably as a reason to eliminate motorized access and motorized recreation;
- fails to provide adequate coordination with local and state governments;
- fails to adequately recognize and address Revised Statute 2477 route standing;
- includes arbitrary and capricious analysis and decisionmaking;
- fails to adequately address justice issues, NEPA compliance issues, undue influence issues, and executive orders justice issues;
- overstates the impact of motorized access and motorized recreation on fish and wildlife and on the natural environment;
- fails to include motorized recreation references that need to be used in the analyses;
- fails to address funding maintenance and gas tax issues; and
- lacks travel management plans and relevant detailed data regarding off-highway vehicle use.

Response

The Forest did not include a specific pro-motorized-recreation alternative, but a range of alternatives is considered in detail in the final EIS. Each alternative emphasizes specific land and resource uses and de-emphasizes other uses in response to the significant issues. This is primarily done by changing management area allocations, resulting in comparisons of the merits amongst the alternatives. Alternative D emphasizes multiple uses and a more active management approach to achieve or move towards desired future conditions and social, economic, and ecological sustainability. Greater emphasis is placed on the use of timber harvest and other mechanical means to achieve desired conditions. Alternative D has the most acres suitable for timber production and available for timber harvest, as well as for motorized access. It's important to realize that motorized access opportunities are and will be constrained by management requirements that are necessary to ensure that habitat conditions continue to contribute to sustaining the grizzly bear population in the NCDE. Changing motorized access significantly during the non-denning season, as suggested by the commenter, is incompatible with the need to

maintain access conditions per the motorized access baseline conditions. Alternative B modified would allow for an increase in motorized trails in portions of the Salish Mountains geographic area that are outside the demographic connectivity for grizzly bears, subject to site-specific analysis. Motorized trails in this area were increased during the time period when the grizzly bear population was growing and expanding into zone 1, following consultation with the USFWS.

A number of the comments referred to a travel management plan. Travel management decisions are separate, project-level decisions that determine the specific areas and routes for motorized recreation consistent with areas identified in the plan as suitable for motorized recreation use. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan.

See also the comments and responses under the following areas of concern: NEPA—General, IRA/Roadless/Unroaded areas, Recommended Wilderness—Decrease Areas, NRLMD, Grizzly Bear, Recreation, Recreation—Off-Road Vehicles and Motorized Use, Recreation—Multiple Use/Balanced Use, Recreation—Trail Maintenance, Safety, Public Involvement, Travel Management Plan, Socioeconomics—Local Communities and Tourism, Socioeconomics—General, Aquatics—Water Quality, Aquatics—Sedimentation, Access—Seniors and Disabled, Draft EIS—Purpose and Need, Forest Plan—Draft EIS General.

Alternatives—Range of Alternatives

Comment (letter numbers 51, 153, 2904, 2940, 3010, 3079)

The Forest did not provide an adequate range of alternatives. Examples of the comments on this topic include the following:

- The draft EIS fails to consider a reasonable range of alternatives for road management. Under alternative A, the no-action alternative, the Forest Service would still need to reclaim over 500 miles of roads and 57 miles of motorized trails (draft EIS, vol. 2, p. 24). In contrast, alternatives B, C, and D “would continue the baseline system [of] roads and wheeled motorized trails.”
- All the alternatives are designed to “allow for retaining all existing permitted activities and facilities.” The rest of the criteria for the design of alternatives document existing legal requirements, but no rationale is provided for limiting the range of alternatives in this manner.
- The draft EIS fails to provide a meaningful comparison among the alternatives regarding road management.
- The alternatives developed as part of the draft EIS, except for alternative A representing the status quo, provide for a proposed expansion of wilderness, a proposed expansion of backcountry, or an expansion of both wilderness and backcountry. No alternative has been developed that would contribute to reducing proposed wilderness and/or reducing backcountry designation. An informal poll indicated the overwhelming majority of Swan Valley residents want less wilderness and less backcountry management restrictions. The range of alternatives is therefore incomplete.

- The Forest Service did not prepare an alternative that would increase both motorized and mechanized use even though it acknowledges these uses to be both desired and expanding.

Response

After considering the analysis in alternatives A through D, and the alternatives considered but eliminated from detailed study, the Forest believes a reasonable range of alternatives was carefully evaluated in compliance with NEPA. The EIS compares alternatives in section 2.4.7 of the EIS and compares effects of alternatives with respect to road management for a variety of resources, including recreation, wildlife, and fish.

The analysis in the final EIS covered a full spectrum of management intensity ranging from a preservation emphasis in alternative C to a highly managed, commodity output and motorized or mechanized recreation emphasis in alternative D, consistent with the purpose and need, laws and regulations, and/or budget constraints. Alternative D would allow for some increase in motorized and mechanized use.

All the action alternatives are realistic, implementable, and responsive to the revision topics. Permits will be reviewed for compliance with the forest plan. Any permit found to be out of compliance will be brought into compliance as soon as practicable using a variety of tools, including modifications or amendments to the permit.

Alternatives—Support, Without Rationale

Comment (letter numbers 10, 32, 62, 230, 235, 262, 285, 304, 313, 325, 331, 2620, 2789, 2826, 2828, 2895, 2912, 3095, 3301)

The Forest should adopt alternative A, B, C, or D. No rationale was provided by the commentors.

Response

Thank you for expressing your support of one of the alternatives. The alternatives represent a range of possible management options that allowed evaluation of their comparative merits. The Forest has identified alternative B modified as the preferred alternative after reviewing and considering the public comments.

Alternatives—Tribal

Comment (letter number 2821)

The Forest should adopt a tribal alternative that reflects the more indigenous view of the natural world that served these ecosystems so well for thousands of years prior to the last century. Consider developing and including tribal alternatives in this and all future forest plan revision processes.

Response

The Flathead National Forest has consulted with the Confederated Salish and Kootenai Tribes since the beginning of the planning process. The Confederated Salish and Kootenai Tribes did not submit an alternative proposal similar to the commenter's suggestion, but they were involved in discussion surrounding the development of the plan components of the forest plan. Part of preserving our historic and cultural national heritage is recognizing that humans are a natural aspect of our national heritage—humans have utilized the physical and cultural resources offered by the Flathead National Forest for thousands of years. Recognizing that, the Forest finds that the

best way to preserve that heritage, and an environment that supports diversity and variety of choice, is to manage for a national forest that provides for use of the physical resources and the appropriate protection of cultural and historic resources. Based upon the collaborative public efforts, tribal consultation, and the effects of each alternative displayed in the final EIS, the preferred alternative, B modified, best meets this goal.

No effects on American Indian social, economic, or subsistence rights are anticipated as a result of the forest plan. No matter which alternative is chosen for implementation, the Forest Service will be required to consult with the tribes, according to the consultation protocol, when management activities may impact treaty rights and/or cultural sites and cultural uses. Desired conditions for areas of tribal importance, under all action alternatives for the plan revision, would be for the Flathead National Forest to (1) recognize and maintain culturally significant species and the habitat necessary to support healthy, sustainable, and harvestable plant and animal populations to ensure that rights reserved by tribes are not significantly impacted or diminished and (2) to recognize, ensure, and accommodate tribal member access to the Forest for the exercise of treaty rights and to provide opportunities to practice traditional, cultural, and religious activities such as plant gathering and ceremonial activities that are essential to sustaining their way of life, cultural integrity, social cohesion, and economic well-being.

Alternatives—Wildlife

Comment (letter numbers 304, 312, 2580, 2646, 2657, 2786, 2904, 2940, 2985, 3037, 3047, 3106)

Some commenters supported alternative B because it would allow the most active management while also providing for the wildlife habitat needs of elk and other wildlife. Others supported alternatives B, C, or D because they would benefit wildlife by providing specific plan components to maintain or improve the composition of grass/forb/shrub habitats, to control invasive weeds, and to limit livestock grazing in key wildlife habitat areas. Some commenters were concerned that the action alternatives relied on the delisting of the grizzly bear.

Some commenters supported alternative C because they felt it would best provide for the habitat security and connectivity of wildlife habitat.

Some commenters supported combining alternatives A and C in order to continue current habitat protection, provide greater security and connectivity via wilderness, prohibit mountain bikes and motor vehicles from recommended wilderness, prohibit springtime snowmobiling in areas where it is currently allowed, and extend protections beyond the recovery zone.

Response

In developing the alternatives, the Forest sought to provide a range that would be responsive to the purpose and need for the forest plan revision, address the issues identified during scoping, and help to portray a range of effects. The rationale for the plan components that were incorporated into each of the action alternatives, as well as the alternatives that were considered but not given detailed analysis, were presented in the draft EIS and have been updated in the final EIS. The responsible official considers all points of view in making the decision and will strive for an appropriate mix of multiple uses and proper management of all resources.

The action alternatives do not rely on NCDE grizzly bear delisting. Rather, they rely on the best available scientific information regarding the NCDE grizzly bear population, grizzly bear body condition data, and the habitat conditions that support a grizzly bear population in the NCDE that

has increased in number, distribution, and trend (also see the comments and responses under Grizzly Bear—Concerns about Delisting, Grizzly Bear Conservation Strategy—Range of Alternatives).

Alternative B modified incorporates some plan components from each of the other alternatives and is identified as the preferred alternative in the final EIS. It continues some of the grizzly bear habitat protections, increases some of the protections, and modifies some of the protections, considering social, economic, and ecological sustainability and the Forest's multiple-use requirements (36 CFR 219.8 Sustainability; 36 CFR 219.10, Multiple Use). For example, alternative B modified requires no net decrease in the baseline for secure core and no net increase in the baseline for open or total motorized route density in the recovery zone/primary conservation area. Alternative B modified includes management areas where active vegetation management would occur to meet desired conditions, including (but not limited to) production of bear foods, habitat diversity, and forests that are resilient in the face of anticipated future climates. Alternative B modified includes additional recommended wilderness (which is not suitable for motorized or mechanized use, including mountain bikes) and includes a guideline that limits developed recreation sites designed or managed for overnight use within the primary conservation area. Alternative B modified also has standard FW-STD-REC-04 that specifies no net increase in percentage of area or miles of routes designated for motorized over-snow vehicle use on NFS lands in the NCDE primary conservation area during the den emergence time period. Alternative B modified includes additional requirements for motorized access and minerals that would apply in zone 1, which covers the remainder of the Flathead National Forest outside the grizzly bear recovery zone. Alternative B modified also includes plan components that address habitat connectivity on all lands for multiple wildlife species, including the grizzly bear. Guideline FW-GDL-IFS-12 was modified to address connectivity in the Swan Valley. None of the alternatives being considered abandon habitat protections for grizzly bears (also see the comments and responses under Alternatives—Wildlife, Threatened and Endangered).

Some commenters supported alternative C or alternative C along with closing and/or decommissioning approximately 500 more miles of roads and motorized trails on the Forest, which was considered under alternative A. Alternative B modified contains objectives to close some additional roads to meet desired conditions for multiple resources. For example, alternative B modified includes two objectives, FW-OBJ-IFS-01 and GA-SV-OBJ-04, to decommission roads or place them into intermittent stored service. GA-SV-OBJ-04 specifically addresses the thousands of acres of land with many miles of roads that were acquired in the Swan Valley in the last decade as a result of the Montana Legacy Project. See also the comments and responses under Grizzly Bear—Habitat Security.

Alternatives—Wildlife, Threatened and Endangered

Comment (letter numbers 14, 54, 249, 2888)

Alternative C would provide the greatest protection for species such as grizzly bear, lynx, and wolverine.

Modeled wolverine maternal denning habitat may decrease as climate change leads to lower snowpacks and earlier snowmelts and suggested that the Forest Service should consider an alternative that would not allow motorized over-snow vehicle use on any of the currently modeled denning habitat.

Response

The Forest considered a range of alternatives for motorized over-snow vehicle use. In the final EIS section 2.4.6, “Alternatives considered but eliminated from detailed study,” an alternative called “No winter motorized recreation alternative” that would encompass modeled wolverine denning habitat is discussed. Under alternative C, only about 3 percent of modeled wolverine maternal denning habitat would be suitable for motorized over-snow vehicle use, a minor amount. Section 3.7.5, subsection “Cumulative consequences” under wolverine, in the final EIS discusses climate change. Published papers on wolverines make climate change projections for mid-century to the late 21st century, but the anticipated life of the plan is the next 15 years. The Forest does not anticipate substantial changes to wolverine maternal or natal denning habitat over the anticipated life of the plan, but if conditions change in the future or if research or monitoring indicates there is a need to address specific threats that are within the Forest Service’s authority or capability to manage, the forest plan could be amended or revised in the future, if deemed necessary.

Aquatics

Aquatics—Additional Analysis

Comment (letter numbers 290, 2904, 2940, 2994)

Some commenters expressed concern that the draft forest plan does not require watershed analyses. Instead, the draft plan envisions using multiscale analysis to inform decisionmaking. The commenters feel this is problematic because multiscale analysis does away with the data-gathering requirement from watershed analysis, instead choosing to rely on whatever information may already be available, regardless of whether that information is taken from a variety of disparate scales and whether it may no longer reflect reality on the ground. In addition, unlike the requirement to conduct complete watershed analyses in the INFISH standards and guidelines, there are no similar requirements in the draft plan, leaving the Forest Service to complete multiscale analyses.

The Montana Department of Environmental Quality has assessed approximately 5.2 percent of the stream miles within the Forest. To provide perspective for the water quality information presented in the EIS, the final EIS should include a map showing assessed waterbodies, unassessed waterbodies, and impaired waterbodies.

Response

A multiscale analysis and a watershed analysis both rely upon using existing information rather than collecting new information to inform a decision. Multiscale analysis is a key planning principle in the updated Interior Columbia Basin Strategy, Interagency Memorandum of Understanding: A Strategy for Applying Knowledge Gained by the Interior Columbia Basin Ecosystem Management Project to the Revision of Land Use Plans and Project Implementation (USDA-USDI-EPA-NMFS, 2013), which develops an aquatic and riparian framework. The forest plan for the Flathead National Forest incorporates this framework. A multiscale analysis looks at multiple scales and multiple lines of evidence at the reach, watershed, and basin scales when evaluating actions at the project level. It also incorporates conservation strategies and the recovery unit implementation plan for bull trout (USFWS, 2015b).

Montana Department of Environmental Quality has a website (<http://svc.mt.gov/deq/wmadst/>) that displays water quality information across the state. This site provides maps that show the

location and status of water quality assessment units, and a link to this site is provided in the final EIS, section 3.2.

Aquatics—Appendix E

Comment (letter numbers 290, 2869, 2904, 3097)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Appendix E to the draft forest plan should contain a table that clearly lists the streams included in the conservation watershed network, whether they are bull trout or westslope cutthroat trout streams, and their status (functioning at risk, impaired, etc.).

2. It is critically important that the Flathead National Forest provide additional plan components for watershed management in the context of the watershed condition framework to ensure that this becomes a much stronger component of the forest plan. The Flathead National Forest is blessed with an abundance of healthy watersheds as well as wild lands: the watershed condition framework assessment in 2011 determined that 97 percent of all watersheds in the Forest are “properly functioning,” while only 3 percent are “at risk” and none is “impaired” (draft forest plan, p. 16). However, the only draft plan components that directly address the watershed condition framework are two objectives that deal solely with the very small number of at-risk watersheds. The Forest Service should adopt standards and guidelines to maintain the properly functioning condition of the 97 percent of the Forest’s watersheds that are functioning properly, including a requirement to conduct a multiscale watershed condition framework analysis using the best available science before any project.

3. The identification of strongholds for bull trout and westslope cutthroat trout across multiple geospatial scales is extremely helpful in the formulation of the forest plan and is an important means of developing an information-based plan for the management of native fisheries in the face of a changing climate, as recommended by the 2012 planning rule and the Northern Rockies Adaptation Partnership. The Forest Service should use this analysis as the basis for addressing concerns about bull trout. This analysis is very much in line with the recommendations and science provided through the Northern Rockies Adaptation Partnership.

4. The Forest Service appears to have rolled priority watersheds from INFISH and critical habitat into the conservation watershed network, appendix E-9. However, the conservation watershed network is largely managed in the same way as all other riparian areas, namely, through riparian management zones and standards and guidelines, appendix E-1. Specifically, the draft plan provides that riparian management zones provide a buffer between certain activities and the watercourse. Essentially, the Forest is ignoring actual risks created by individual projects as long as they honor the riparian management zone buffers. The conservation watershed network desired conditions, objectives, and guidelines that go beyond the provisions for all riparian management zones do not create mandatory protections and instead offer only flexible and/or aspirational guidance.

5. The draft plan does not require sufficient analysis before actions can be undertaken in riparian management zones or the conservation watershed network. Although the identification of the conservation watershed network was apparently the result of multiscale analysis, the draft plan does not require that another multiscale analysis be undertaken before actions can occur. In addition, even if the Forest Service were to undertake a voluntary multiscale analysis, it would be a weak measure. Multiscale analysis does not require the Forest Service to study the area and thus

create up-to-date data. Instead the Forest Service is free to rely on whatever data it already has, regardless of whether it adequately reflects current conditions. In addition, in its discussion of an example of multiscale analysis that the Forest Service could undertake in relation to a project, the Forest Service says that it would consider the impact on the population at issue in relation to the status of bull trout in the Flathead Basin, appendix C-9. However, the Flathead Basin is not a reasonable reference point as it is already a disturbed area that presents too low a goal.

6. The conservation watershed network for native fish should also include protecting the lakes and streams that are or were originally fishless in order to maintain the original amphibian and aquatic life. This does not seem to be a consideration in the 1986 forest plan, in the draft forest plan, or in the wilderness. This is a gross oversight for natural processes and all associated species.

7. Many of the wilderness and non-wilderness lakes and some streams in the South Fork of the Flathead River had fish introduced to fishless lakes, and this continues to be done. So, non-native fish stocked into originally fishless lakes provided fishing opportunities at the expense of the native amphibians and other aquatic life in those lakes.

Response

1. Appendix E contains a map of the conservation watershed network, and the baselines that you refer to can be found in Van Eimeren and Gardner (2017). The baselines that determine the status calls that you refer to, such as functioning appropriately, functioning at risk, and functioning at unacceptable risk, are automated using GIS runs with various metrics. The baselines were intended as standardized assessments of aquatic habitat conditions for bull trout across individual Bureau of Land Management and Forest Service units. This effort was also intended to allow the USFWS to assess project effects at larger scales—a requirement under the Endangered Species Act for reaching a no jeopardy determination in a timely fashion. Environmental baselines are analyzed at the 6th field watershed (i.e., USGS hydrologic unit code (HUC)) and include information for each of the primary bull trout population and habitat indicators.

2. Healthy watersheds are partly due to protected areas such as designated wildernesses and resiliency associated with the Forest's geology but are also due to the standards and guidelines from INFISH that amended the 1986 plan in 1995. The same standards and guidelines from INFISH are carried forward in the forest plan, with slight modifications for clarity, and the Forest is confident that these plan components will provide for healthy watersheds. Multiscale analysis is detailed in appendix E, and the best available scientific information will be considered for every project. Refer to additional discussion and background on INFISH in the introduction to section 3.2 in the final EIS. Also refer to environmental consequences section 3.2.8 for discussion of effects to watersheds and water quality from the plan components.

3. The Forest used the Northern Rockies Adaptation Partnership report (Halofsky et al., in press) as well as the concept of the cold-water climate shield (Daniel J. Isaak, Young, Nagel, Horan, & Groce, 2015) to help identify strongholds for native fish that will serve as cold water refugia into the future in the face of a warming climate. The Forest rests along the spine of the Continental Divide and thus is positioned to provide cold water for native fish and other organisms; climate modeling indicates that the Forest will be extremely important for the conservation of native fish due to a warming climate.

4. Yes, the riparian areas in the conservation watershed network and those outside the network are being managed the same since the development of plan components related to riparian

management zones are based on best available scientific information, which indicates that protecting the area 100 to 150 feet from the stream bank is largely sufficient to maintain stream habitat and ecological functions. Refer to section 3.2.6 in the final EIS for additional discussion of the science behind the development of minimum riparian management zone widths.

5. Multiscale analysis is an assessment at various scales that considers existing conditions, factors that are limiting aquatic species populations, resource risks, management needs, restoration opportunities, and interagency coordination. If existing data is inadequate or lacking, new data may be collected.

Multiscale analysis provides a basis for integration and prioritization of conservation measures for bull trout. When evaluating a project, consideration should be given to where the project is in relation to the reach, such as above or below bull trout spawning, habitat conditions, riparian conditions; the subwatershed (5th or 6th field hydrologic unit code), such as habitat and riparian conditions in the watershed, non-native species, etc.; and the subbasin (4th field hydrologic unit code), such as size, trend, and status of the core population, influence of Flathead Lake and Swan Lake non-native species interaction, and the importance of bull trout relative to neighboring populations.

6. The forest plan establishes riparian management zones for all waterbodies, whether they contain fish or not. Wetlands, in particular, are afforded relatively high protection by the establishment of 300-foot-wide riparian management zones for wetlands over 0.5 acre in size. Standards and guidelines that direct management activities within riparian management zones are designed to protect the wide range of values associated with the waterbodies, including fish, amphibians, invertebrates, and plant and animal species.

7. Stocking is under the purview of MFWP, and the Forest works closely with MFWP on this program. Stocking of rivers and streams on the Forest has not occurred since 1976, so the fish are produced naturally and wild. Lakes on the Forest do get stocked every three to five years, but no new lakes have been stocked since 1983 that had not already been stocked with fish.

Aquatics—Forest Plan Components

Comment (letter numbers 54, 108, 290, 2574, 2765, 2869, 2875, 2904, 2994, 2996, 3009, 3094)

Note: The Forest received many comments related to aquatic plan components. Responses under this area of concern are located immediately after each specific comment.

For comments addressing riparian management objectives, also see the comments and responses under Aquatics—Riparian Management Objectives.

1. The Forest should retain the riparian management objectives with numeric standards that include a sediment standard. Numeric standards are needed to evaluate whether streams have the appropriate habitat conditions for native fish, including bull trout. **Response:** PIBO monitoring, which compares reference versus managed habitat conditions, is a better approach to determine the condition of fish habitat than set numeric standards, which don't take into account the dynamic and variable nature of stream systems. Hiers et al. (2016) present the argument that more flexible and decentralized approaches may result in more effective management in a changing environment.

2. FW-DC-WTR-01: This forestwide desired condition needs to explicitly acknowledge climate change and the challenges climate change poses to the stated intent of this desired condition.

Response: Climate change is addressed in FW-DC-CWN 01, and the challenges with regards to fisheries are discussed in the final EIS in section 3.2.12.

3. FW-DC-WTR-02: This desired condition should be elevated to a standard in order to ensure that connectivity is accounted for explicitly in project design and implementation. **Response:** FW-GDL-IFS-14 provides for connectivity: “To provide and maintain native aquatic organisms in fish-bearing streams, construction, reconstruction, or replacement of stream crossings should provide and maintain passage for all life stages of native aquatic organisms unless barriers are created or maintained to prevent spread or invasion of non-native species in alignment with fish and wildlife management agencies.”

4. The Forest should include Swan Lake, Haskill Creek, and Stillwater River as impaired because Forest Service activities may be affecting their impairment. Complete all essential work on all of these priority watersheds. **Response:** “Essential work” has a specific meaning under the watershed condition framework. The Forest’s focus will be to concentrate its work in those watersheds (hydrologic unit code 6). The Forest will work closely with partners to improve the water quality of Swan Lake, Haskill Creek and Stillwater River, which have TMDLs.

5. FW-OBJ-WTR-02: “Enhance or restore 50 to 100 miles of stream habitat to maintain or restore structure, composition, and function of habitat for fisheries and other aquatic species. Activities include, but are not limited to, berm removal, large woody debris placement, road decommissioning or stormproofing, riparian planting, and channel reconstruction.” Define stormproofing. Explain why only 50 to 100 miles of streams are to be maintained or restored.

Response: Stormproofing is now defined in the glossary in the final EIS as follows: “A stormproofed road is one where measures have been taken to either upgrade or decommission the road so as to minimize the risk and potential magnitude of future erosion and sediment delivery. It generally consists of reducing hydrologic connectivity; identifying and treating potential road failures (mostly fill slope failures) that could fail and deliver sediment to streams; and reducing the risk of stream crossing failures and stream diversion.” The Forest has lowered the objective to 25-50 miles because a considerable amount of restoration has occurred on the Forest over the past two decades. There is a lack of grazing, mining, and ditches on the Forest relative to other national forests in Montana, which reduces the amount of restoration work that needs to be done. The amount of work is based on what the Forest has accomplished in the past decade.

6. FW-OBJ-WTR-03: “Reconnect 10 to 20 miles of habitat in streams disconnected by roads or culverts where aquatic and riparian-associated species’ migratory needs are limiting distribution of those species.” Explain why there are only 10 to 20 miles of disconnected stream habitat that will be reconnected. Is that all there is on the Flathead? What streams are they? Over what time period will they be reconnected? **Response:** There has been considerable work done over the past two decades to provide for fish passage. There are no human-made barriers blocking bull trout from upstream spawning areas. There is still work to be done to provide fish passage for westslope cutthroat trout, and the sites will be determined during site-specific project analysis. The time period for all work is the life of the plan, which would be about 15 years.

7. FW-OBJ-WTR-04: “Improve soil and watershed conditions on 4,000 to 8,000 acres with an emphasis on priority watersheds under the Watershed Condition Framework and Conservation Network Watersheds.” How many acres are in need of soil and watershed improvement? How will these acres be selected? Over what time period will they be improved? **Response:** It is difficult at this programmatic level to determine the number of acres in need of treatment, so this is an estimate. Site-specific project analysis will determine the locations and amount.

8. FW-GDL-WTR-05: “Existing stream diversions and associated ditches should have screens placed on them as needed to prevent capture of fish and other aquatic organisms.” Include with standard 01. **Response:** This guideline has been combined with the standard.

9. Stormproof needs to be defined and you must explain why this is better for the watershed and attaining riparian management objectives than decommissioning roads. **Response:** Stormproofing is defined above under response 5 and in the glossary. Decommissioning roads will be used in combination with stormproofing, which targets open roads, to benefit watersheds.

10. FW-GDL-CWN-01: “For subwatersheds included in the Conservation Watershed Network, net increases in stream crossings and road lengths should be avoided in RMZs unless the net increase improves ecological function in aquatic ecosystems. The net increase is measured from beginning to end of each project.” Also see FW-IFS-STD-02. Delete this guideline. Increasing road lengths in riparian management zones does not improve ecological function. **Response:** The guideline is designed to avoid net increases in road lengths. It allows for an increase where it would result in an improvement to aquatic ecosystems, such as when a road is relocated to be farther away from a stream bank.

11. Objective FW-OBJ-RMZ-01 is to improve 300 to 1,000 acres of riparian habitat. Define “improve.” How was the acreage determined? **Response:** Riparian habitat for wildlife can be improved in some areas by restoring vegetation diversity, such as hardwood trees and shrubs. The presence of hardwood species on the Forest is relatively low compared to the desired range (see section 3.3.3 in the final EIS). The acreage to be improved is an estimate based upon the amount of riparian habitat treatment that might be accomplished over the life of the plan to increase hardwood components, taking into consideration anticipated budget levels.

12. Comments on the following standards:

- FW-STD-RMZ 02: “Ensure vegetation management activities proposed within riparian management zones and riparian habitat conservation areas are consistent with state law (e.g., Montana streamside management zone law; see appendix C).” The streamside management zone law and other state laws are not sufficient to protect water quality or fish habitat.
- FW-STD-RMZ 03: “Vegetation management can only occur in the inner riparian management zone when necessary to maintain, restore or enhance aquatic and riparian associated resources and to meet riparian management zone desired conditions.” The Forest Service provides no scientific justification for logging in riparian areas.

Response: Alternative B modified includes numerous plan components to protect water quality and fish habitat in addition to streamside management zone law and other state laws. Regarding the widths of management areas next to streams, the interim minimum distances listed for fish-bearing (300 feet) and perennial streams (150 feet) arguably remain the most controversial components of the existing strategies. Numerous studies have been completed since the strategies were first published that investigate how management affects the different ecological processes that are a function of riparian management zones.

Initial studies completed by Chen et al. (Chen, Franklin, & Spies, 1993; FEMAT, 1993) found that streamside buffers of approximately 125 meters were needed to protect ecological processes such as wind speed and humidity near streams, which at the time were thought to be able to increase stream temperature. Based upon this science, the Forest could have some timber harvest beyond 125 meters and not affect stream temperature.

The ecological processes that function within riparian zones are first discussed individually and then in combination in the final EIS because they affect both aquatic and riparian conditions and biota. See the discussions of stream temperature, large wood, sediment and nutrients, and bank stability in section 3.2.6 of the final EIS.

13. FW-GDL-IFS 04: “To reduce the risk to aquatic resources when deciding to decommission roads, make roads impassable, or store roads longer than 1 year, roads should be left in a hydrologically stable condition with all culverts removed and the road rendered impassable.” Hydrologically stable condition is not defined in any of the glossaries. **Response:** This is now defined in the glossary in the final EIS as “a road that has been essentially stormproofed through a series of proactive steps and activities so that further maintenance will not be needed and significant erosion will not occur.”

14. FW-DC-WTR-12 and 18 seem duplicative. **Response:** FW-DC-WTR-18 has been deleted.

15. FW-DC-WTR-15: How is a forest plan going to ensure beavers are active on the Forest? Will there be a beaver transplantation program implemented? MFWP manages the animals and the Forest Service manages the habitat. **Response:** FW-DC-WTR-14 now reads: “Beavers play an important ecological role benefiting groundwater, surface water, stream aquatic habitat complexity, and adaptation to changing climate conditions.” The Forest feels it is important to recognize the ecological role beavers play, wherever they are active. If needed, the Forest will work with MFWP when opportunities arise to relocate or reintroduce beavers.

16. FW-STD-WTR-01 is too specific to be a forest plan standard. This is a project-specific mitigation that may or may not be justified depending on the details of the project. This standard should be deleted or changed to a guideline. **Response:** Placing screens on ditches or diversions is one of the most straightforward actions the Forest can do to protect native fish. Thankfully, the need does not arise often as there is only one diversion on the Forest that is not in fish habitat.

17. FW-STD-WTR-02: This should be listed as a guideline, not a standard. The voluntary nature of best management practices is intentional to allow for the best decisions be made on the most effective practice for the specific application. Adoption as a standard would remove the necessary flexibility in the method of application. **Response:** Best management practices will be applied for each project as a standard and will not be changed to a guideline. The best management practices will be determined site-specifically.

18. FW-STD-WTR-04: This is too specific to be a forest plan standard. Isn't this standard operating procedure? This standard should be deleted or at a minimum changed to a guideline. **Response:** Yes, requiring spill containment provisions for portable pumps is standard operating procedure; it is included as a standard because it is considered an important measure to protect water quality.

19. FW-GDL-WTR-03: It is not the role of the Forest Service to secure instream flows; this guideline should be removed. **Response:** FW-GDL-WTR-03 has been deleted.

20. FW-GDL-WTR-06, 07, and 08: These guidelines are too specific for a forest plan. How are you going to implement this? How will you identify “spawning gravel”? MFWP still allows beaver trapping. Project-level mitigations should identify timing restrictions, not the forest plan. This may be a good operating procedure, but it does not belong in the forest plan. Delete these. **Response:** FW-GDL-WTR-06, 07, and 08 are guidelines that the Forest currently implements on projects. If the Forest can meet the intent of these guidelines to protect spawning fish and beavers,

then an alternative method could be implemented at the project level. Bull trout spawning reaches have been surveyed since 1980, and bull trout return to the same location to spawn. Spawning gravel for bull trout is about 1-3 inches in size.

21. FW-DC-CWN-01: Where and when was the public involvement and NEPA work done on establishing the conservation watershed network and designating entire watersheds with yet another level of potential restriction and management burden? This concept, along with the watershed condition network, was not even included in the proposed action or any of the public collaboration discussions. Adopting these priority tools as part of the forest plan establishes yet another level of management area designations. **Response:** The conservation watershed network was available for comment during the 120-day comment on the draft plan and draft EIS.

22. FW-GDL-CWN-01: This is a broad-reaching and potential extremely restrictive guideline that has been proposed without any third-party review or validation. The reference to FW-IFS-STD-02 makes no sense. **Response:** The reference to FW-IFS-STD-02 has been dropped. The Forest does not see this guideline as being extremely restrictive; it is a way to help protect riparian and stream functions, mostly through the reduction of sediment that may occur from roads.

23. FW-DC-RHCA-04 in the proposed action stated, “In areas where people live, municipal watersheds, critical riparian habitat, impaired waterbodies and in mountainous areas with developments such as resorts, RHCA’s [riparian habitat conservation areas] have rates of wildfire spread that is not higher than the surrounding forest.” This should also be a desired condition in the current forest plan. **Response:** The intent of FW-DC-RHCA-04 is now captured in FW-DC-RMZ-01: “Riparian management zones reflect a natural composition of native flora and fauna and a distribution of physical, chemical, and biological conditions appropriate to natural disturbance regimes and processes affecting the area. In addition to natural processes, vegetation management activities contribute to vegetation conditions that are resilient. The species composition and structural diversity of native plant communities in riparian management zones, including wetlands, provide summer and winter thermal regulation, nutrient filtering and appropriate rates of surface erosion, bank erosion, and channel migration.”

24. FW-STD-RMZ-01 through 06: Commenters had different viewpoints on riparian management zone widths and associated standards. Some stated that the increased size of riparian management zones for intermittent streams and wetlands, in addition to improving fish habitat and water quality, will also provide beneficial habitat connectivity for wildlife species such as marten and fisher, as indicated in FW-DC-WL SOI-01 on p. 54 of the draft plan. This materially advances the role of riparian areas as a riparian connectivity network for climate change adaptation and connectivity to conserve biological diversity, and the increased wetland buffer size apparently reflects coordination with tribal and state plans for climate change and wildlife (draft EIS, vol. 1, pp. 272-273). Others stated that the Forest’s approach is the wrong tactic for implementing riparian management zone management direction. Including this level of detail as a forest plan standard makes no sense and opens the agency up to tremendous risk of legal challenge. These regulations may be appropriate project-level mitigation and may even be appropriate to adopt to comply with other necessary regulation, but they should not be a standard in the forest plan. What happens when there is new science or a site-specific situation that requires modification to these standard procedures? A forest plan amendment will have to be prepared. At a minimum, these standards should be changed to guidelines. A better tactic would be to place them in an appendix and make reference to “adopting appropriate riparian management zones that meet site and project specific needs.” **Response:** Riparian management zone widths are standards because the

science indicates, as discussed in response 12 above, that the first 100-150 feet from the stream is of highest importance in protecting stream function and processes. The Forest has established inner and outer riparian management zones to be more flexible on the degree of protection and the use of different management options to achieve desired conditions for riparian areas. This allows for variable site-specific conditions to be incorporated into project decisions but also emphasizes the ecological value that these zones adjacent to waterbodies provide. On the Flathead National Forest, these areas may be important not only for aquatic and stream functioning but also provide important wildlife habitat and are a key feature of the Forest's strategy to provide connectivity of habitat for a range of species. Increasing the width of riparian management zones around intermittent streams and wetlands is designed to benefit wildlife, fish, and water quality. Site-specific analysis at the project level will determine to what extent management activities will occur within riparian management zones. Refer to the expanded discussion in the riparian management zone section of the final EIS for additional information (sections 3.2.5, 3.2.6, and 3.2.10). Also refer to the riparian area section in appendix C for possible management approaches and strategies associated with management within riparian zones under the forest plan direction.

25. FW-GDL-RMZ-01: This guideline clearly indicates that the intention is to have no management within riparian buffers. The suggestion to leave all trees within the riparian management zone is simply contrary to the concept of land management. It even suggests "moving" trees rather than selling them commercially. Delete this guideline. **Response:** The word "downed" was inadvertently removed in the draft forest plan. The intent of this guideline is to retain downed wood for wildlife and amphibians where it is safe and practical to do so. This word has been added back in so the guideline now correctly reflects the intent.

26. FW-GDL-RMZ-03: Although this would normally sound like a reasonable best management practice, when considering the potential for immense buffer widths that could extend all of the way from valley floor to ridge top, this would be a seriously limiting guideline. It could conceivably limit any cross-slope roads within a drainage. **Response:** This guideline has been deleted and there are restrictions for road building in riparian management zones in the conservation watershed network under FW-GDL-CWN-1.

27. FW-GDL-RMZ-10: Why would you identify a single silvicultural treatment as inappropriate? If the site-specific analysis supports this prescription as the best way to meet all resource objectives, the forest plan should not prevent that from happening or make it harder. This guideline is not needed and should be deleted. **Response:** This guideline no longer applies and has been replaced with the following to address your concern:

- FW-GDL-RMZ-08: "If tree harvest activities occur within riparian management zones, live reserve trees should be retained (if present) to protect water quality and contribute to forest structural diversity for aquatic- and riparian-dependent species (e.g., the clearcut harvest method should not be used). Because site and forest conditions vary considerably, the sizes, species, density, and pattern of reserve trees would be determined at the project level."
- FW-GDL-RMZ-09: "If new openings are created in riparian management zones through even-aged regeneration harvest or fuel reduction activities, each created opening's distance to cover (see glossary) should not exceed 350 feet to provide wildlife habitat structural diversity, connectivity, and cover."
- FW-GDL-RMZ-10: "If harvest activities occur within riparian management zones, all snags greater than or equal to 12 inches d.b.h. should be retained within the harvest area to

contribute towards more diverse forest structure and desired habitat conditions by providing higher snag and downed wood densities (once the snags fall) as compared to areas outside riparian management zones. Exceptions to this guideline may occur where there are issues of human health and safety (i.e., developed recreation sites, sites adjacent to landings) or where decreased amount of wildland fuels are desired to protect communities and community assets (i.e., within the wildlife-urban interface). Due to the high variability in snag and landscape conditions created by wildfire, exceptions may also be considered in areas burned by stand-replacing fire based on a site-specific analysis.”

28. FW-DC-SOIL-01 and 03: These desired conditions talk about stand structure in riparian management zones, yet the ability to manage in the riparian management zone is all but nonexistent due to other standards in the forest plan. How will you meet this objective?

Response: These are desired conditions. Management activities may be applied to maintain or trend towards meeting the desired conditions for riparian management zones. The standards and guidelines under Soils will allow the Forest to meet these desired conditions. Current monitoring by the Forest’s soil scientist indicates that the Forest does meet these conditions.

29. There is no sediment standard. Instead of strengthening the standards contained in the Inland Native Fish Strategy (INFISH), including a standard for sediment since INFISH did not contain one, the draft forest plan has weaker-than-INFISH management direction that probably won’t even maintain the status quo. **Response:** There was no sediment standard under INFISH due to the dynamic manner in which sediment is routed and stored. There is no sediment standard in this plan for the same reason, that natural rates of sediment can vary so much between watersheds, as is found in PIBO data just between reference sites. With that said, many plan components are designed to minimize sediment input to streams because there is a link between sediment and the embryonic survival of fry.

30. The forest plan should include an objective to complete the TMDLs in all of the places for which they have not been carried out yet. **Response:** Fortunately, only eight streams on the Forest are on the 303(d) list, as displayed in table 7 of the final EIS. FW-DC-WTR-06 provides guidance for completing TMDLs: “Water quality, including groundwater, meets or exceeds applicable state water quality standards, fully supports designated beneficial uses, and meets the ecological needs of native aquatic and riparian-associated plant and animal species. The Forest has no documented lands or areas that are delivering water, sediment, nutrients, and/or chemical pollutants that would result in conditions that violate the State of Montana’s water quality standards (e.g., TMDLs) or are permanently above natural or background levels.”

31. FW-OBJ-WTR-03: The goal of reconnecting “10-20 miles of habitat in streams disconnected by roads and culverts where aquatic and riparian-associated species’ migratory needs are limiting distribution of those species” should be increased significantly to ensure that this work occurs on a scale that has biological significance for the maintenance of native salmonids over the long term rather than the extremely limited and ineffective goals stated here. As is the case with many climate adaptation strategies and tactics, management interventions must be implemented strategically at a geospatial scale large enough to move the entire population/metapopulation in the desired direction by creating a high signal:noise ratio. A large body of scientific literature, along with recommendations by the Northern Rockies Adaptation Partnership, provides strong support for this recommendation. For example, “Adaptation tactics include . . . reconnecting and increasing off-channel habitat and refugia, identifying and improving stream crossings that impede fish movement, decreasing road connectivity, and revegetating burned areas to store sediment and maintain channel geomorphology” (Halofsky et al., in press). **Response:** Over the last two decades, a considerable amount of work has been completed to provide fish passage. No

human-made barriers remain on bull trout streams, so fish passage would be primarily for westslope cutthroat streams where culvert removal or replacements often may only provide access for 1-2 miles prior to the gradient increasing to the point where the stream is no longer occupied by trout.

32. FW-DC-WTR-07: A critically important role for Flathead National Forest management in ensuring that “the sediment regime within water bodies is within the natural range of variation” involves decommissioning (i.e., removing) road segments and/or entire roads that contribute sediment to aquatic ecosystems; particularly in areas that constitute strongholds for bull trout and westslope cutthroat trout (e.g., (Al-Chokhachy et al., 2016)). The Flathead National Forest, in particular, has a wealth of options for decommissioning roads and road segments, given it has received significant acreage from Plum Creek during the Montana Legacy Project; these lands have an extremely high density of roads per square mile. **Response:** Yes, the Montana Legacy Project lands in the Swan Valley will be the Forest’s highest priority for decommissioning, as stated in objective GA-SV-OBJ-04, particularly Jim and Cold Creeks since they support bull trout populations.

33. The final plan should provide desired conditions, objectives, and standards that substantively address the road network, in keeping with long-standing and repeatedly emphasized directives from the Washington, DC, office of the Forest Service to significantly reduce the road network across national forest lands. Lands on the Forest have an extremely high density of roads per square mile. **Response:** Objective FW-OBJ-IFS 01 is geared towards reducing the Forest’s road network: “Decommission or place into intermittent stored service 30 to 60 miles of roads. Priorities are roads causing resource damage in priority watersheds and/or roads located within desired nonmotorized recreation opportunity spectrum settings and/or roads within bull trout watersheds.”

34. FW-OBJ-CWN: Explain why the Flathead National Forest has settled on a goal of stormproofing only 15-30 percent of the roads in the conservation watershed network to benefit aquatic species, particularly in light of the significance of these management activities to sustaining native salmonid fisheries in an era of shifting climate. How were these percentages chosen? As is the case with many climate adaptation strategies and tactics, management interventions must be implemented strategically at a geospatial scale large enough to move the entire population/metapopulation in the desired direction by creating a high signal:noise ratio. Also explain how the final percentages effectively address the vulnerabilities identified for native salmonids in the Flathead National Forest assessment and within the context of the Northern Rockies Adaptation Partnership’s recommendations for bull trout and westslope cutthroat trout climate adaptation strategies and tactics. . . . Also, remove the phrase “as funding allows” from the above objective and all other objectives in the forest plan as this language gives the impression that the Flathead National Forest may not, in fact, complete any of this critically important work over the course of the next 15-30 years. It is vital that the Forest Service fully commit to doing the work outlined in the forest plan rather than including phrases that make completion of the work optional. **Response:** The phrase “as funding allows” has been removed. The percentages are a best estimate of the proportion of roads that are close to streams versus those that are on ridge tops within the conservation watershed network. The highest priority would be roads close to streams, given the potential for more direct inputs of sediment if culverts were to fail.

35. FW-STD-RMZ-06: Is it ever appropriate to apply herbicides in riparian management zones? What are the potential negative impacts to aquatic macroinvertebrates, amphibians, and native

salmonid fisheries of doing so? **Response:** This is now addressed in FW-STD-RMZ-04: “Herbicides, pesticides, and other chemicals shall not be applied within riparian management zones. Exceptions may be made if chemical use is necessary to maintain, protect, or enhance aquatic and riparian resources or to restore native plant or animal communities.” Effects upon macroinvertebrates, amphibians, and native fish would be assessed during the site-specific project analysis and would depend upon the rate and type of herbicide being used, among other things. If effects could not be mitigated, then herbicides would not be applied within riparian management zones.

36. The conservation watershed network is an excellent approach to maintaining connectivity for aquatic and semi-aquatic species and ensuring that long-term habitat is available, given the projected impacts of climate change. However, currently it is a guideline in the forest plan (FW-GDL-CWN-01) that no net increases to the road network and road crossings in the conservation watershed network should be allowed in the future. This should be upgraded to a standard in the forest plan. **Response:** This is a guideline because it allows for an exception. An example might be when a road needs to be relocated away from a stream but the road cannot be relocated out of the riparian management zone due to topographic confinement. There would still be benefits to moving it away from the stream, even though it can’t be relocated outside of the riparian management zone, but the road length may increase as a result of this action.

37. FW-GDL-IFS-03 provides that roads and trails “should have a water drainage system that is hydrologically disconnected from delivering water, sediment, and pollutants to water bodies (except at designated stream crossings) to maintain the hydrologic integrity of watersheds.” FW-GDL-IFS-06 provides that roads and trails “should avoid lands with high mass wasting potential” in order to “maintain and/or improve watershed ecosystem integrity, and reduce road-related mass wasting and sediment delivery to watercourses.” FW-STD-IFS-06 directs the Forest Service to not side-cast fill material from new road construction and reconstruction of existing road segments. This does not address side-casting of snow or fill material during maintenance of existing roads, which can also introduce sediment to watercourses. For those situations, FW-GDL-IFS-09 merely provides that for road maintenance activities such as road blading and snow plowing, side-casting should be minimized, “particularly into or adjacent to water bodies.” This is not the same as INFISH’s prohibition on side-casting in riparian habitat conservation areas. These guidelines need to follow a best management practices standard. **Response:** Guideline FW-GDL-IFS-09 addresses side-casting during road maintenance. The second sentence addresses the main concerns for existing roads and considers best management practices. Site-specific analysis at the project level will determine to what extent management activities will occur within riparian management zones. When maintaining forest roads, all attempts are made to prevent side-casting of road material and snow, however, it is nearly impossible to not have some material roll down the road fill, and thus it is a guideline. The Forest works closely with contractors to ensure that they understand this principle to not side-cast.

38. Standards should be incorporated into the forest plan that not only meet but exceed the standards in INFISH and provide for greater protection of riparian management zones and bull trout across the board. Any variation from INFISH standards should be documented by reference to best available science, not vague and unsupported conclusory statements, and information should be given explaining how the variation is more protective than INFISH. Streams with critical habitat for sensitive, threatened, or endangered species should be given an outstandingly remarkable value for fisheries or wildlife as a matter of definition of the words “rare” and “significant,” of which they are both, and the specific eligibility suggestions made by American Rivers et al. in their May 15, 2015, scoping letter regarding stream segments that serve as critical

bull trout habitat should be adopted. **Response:** Bull trout are an outstandingly remarkable value, but not all bull trout critical habitat streams were determined eligible. The strength of the bull trout population was also considered, with the strongest receiving a rating of 4 rather than 3. INFISH standard and guidelines have shown to improve habitat conditions since their implementation in 1995. There is no justification from best available science that standards that exceed INFISH are needed. Refer to sections 3.2 in the final EIS, under the subsection INFISH background, as well as discussions and references to best available science in the environmental consequences sections for riparian areas, water quality and aquatic species (sections 3.2.6, 3.2.8, 3.2.9, and 3.2.10). Thomas (2017) also contains information on INFISH and the associated science.

39. The Forest should include connectivity to groundwater in desired conditions FW-DC-WTR, for example, in 02 as well as 10. **Response:** Connectivity of groundwater has been added to FW-DC-WTR-2 and 10.

40. Guidelines that should be standards include FW-GDL-WTR 01 (sediment and TMDL) and 10 (cleaning equipment to prevent aquatic invasive species introductions). **Response:** This is a guideline because when equipment is operating in the same watershed without moving to a different watershed and aquatic invasive species are not present, there is no likelihood of moving aquatic invasive species and thus no requirement to reinspect or disinfect. Conversely, during fire operations there may be times when disinfection may not be able to occur if there are time constraints related to life and safety. FW-GDL-WTR 01 is a guideline since there may be times when an action may result not in a short-term restoration but instead in a longer-term restoration in a TMDL watershed, such as a culvert removal or road reclamation.

41. FW-STD-RMZ 04: “Long-term” should be defined based on scientific information on the ability of aquatic and riparian conditions to recover from disturbance. **Response:** This standard has been dropped for similar concerns mentioned in a comment about the difficulty of defining “long-term degradation” (item 7 under Aquatics—Riparian Management Zones). The standards and guidelines associated with treatments within riparian management zones and with vegetation treatments in general (such as the direction in the Soils section) are sufficient to protect aquatic and riparian values.

42. FW-GLD-RMZ 01: The Forest should delete this guideline and not allow tree removal in riparian management zones. **Response:** The Forest inadvertently omitted the word “downed”; the Forest’s intent is to leave downed trees to the extent practical to provide large wood for wildlife and amphibians. The word has been added back in.

43. FW-GDL-RMZ-02: The italicized part of this guideline should be deleted: “New landings, designated skid trails, staging or decking should not occur in RMZs [riparian management zones], *unless there are no alternatives, in which case these activities should be of minimum size and be located outside the active floodplain.*” FW-GDL-RMZ 07: Change to a standard that does not allow refueling, equipment maintenance, or storage of fuels and other toxicants in riparian management zones. **Response:** The Forest intends to keep landings, skid trails, and log decks outside of riparian management zones due to their potential to disturb soils and create sediment. Topography may limit the Forest’s ability to do this, however, which is why the exception “unless there are no alternatives” is included in the guideline. Standard FW-STD-RMZ-03 only allows refueling if approved by an aquatic specialist or resource advisor; this activity is often used when running pumps for fire suppression.

44. Change FW-GDL-RMZ-10 to a standard: Clearcut harvest will not occur in riparian management zones. **Response:** This guideline has been dropped and replaced with three guidelines that focus on the forest structure that should be retained in the riparian management zone when harvesting:

FW-GDL-RMZ-08 If tree harvest activities occur within riparian management zones, live reserve trees should be retained (if present) to protect water quality and contribute to forest live tree structural diversity (and future dead standing and down wood) for aquatic- and riparian-dependent species (e.g., the clearcut harvest method should not be used). Because site and forest conditions vary considerably, the sizes, species, density, and pattern of reserve trees would be determined at the project level. Refer to appendix C for approaches that may be used to meet this guideline.

FW-GDL-RMZ-09 If new openings are created in riparian management zones through even-aged regeneration harvest or fuel reduction activities, each created opening's distance to cover (see glossary) should not exceed 350 feet to provide wildlife habitat structural diversity, connectivity, and cover.

FW-GDL-RMZ-10 If harvest activities occur within riparian management zones, all snags greater than or equal to 12 inches d.b.h. should be retained within the harvest area to contribute towards more diverse forest structure and desired habitat conditions by providing higher snag and downed wood densities (once the snags fall) as compared to areas outside riparian management zones. Exceptions to this guideline and development of an alternative snag prescription may be considered where there are issues of human health and safety (i.e., developed recreation sites, sites adjacent to landings) or where decreased amount of wildland fuels are desired to protect communities and community assets (i.e., within the wildlife-urban interface). Due to the high density and variability in snags and landscape conditions created by wildfire, exceptions and alternative prescriptions may also be considered in areas burned by stand-replacing fire based on a site-specific analysis.

45. In addition to editing the text of the final EIS to extend the special water quality considerations to all impaired streams, the Forest should add the following guidelines: (1) Ground-disturbing activities in watersheds that do not have water-quality-impaired waterbodies shall be planned, designed, and implemented to protect and maintain project area watershed conditions and water quality to maintain continued support of beneficial uses. (2) Ground-disturbing activities in watersheds with water-quality-impaired waterbodies (listed under category 4a or 5 on Montana's Clean Water Act Section 303(d) list) shall be planned, designed, and implemented to not cause further degradation of water quality and thereby promote improved watershed conditions and water quality and restoration of full support of beneficial uses.

Response: FW-DC-WTR-06 addresses this: "Water quality, including groundwater, meets or exceeds applicable state water quality standards, fully supports designated beneficial uses, and meets the ecological needs of native aquatic and riparian-associated plant and animal species." The Forest has no documented lands or areas that are delivering water, sediment, nutrients, and/or chemical pollutants that would result in conditions that violate the State of Montana's water quality standards (e.g., TMDLs) or that are permanently above natural or background levels.

FW-GDL-WTR-01 also provides direction related to this: "In order to restore watersheds, sediment-producing activities in watersheds with approved TMDLs should be designed to comply with the Montana Department of Environmental Quality's TMDL implementation plan."

46. The forest plan allows the Flathead National Forest to log for any reason, build roads, and mine within 300 feet of any stream or river. There are no standards for maintaining water quality, large woody debris, shade, etc. **Response:** Numerous plan components, including standards and guidelines, provide direction for the Forest's management activities. These occur throughout the plan; see the sections on riparian management zones, soils, terrestrial vegetation, and infrastructure.

47. Riparian management zone guidelines should prohibit new road construction within 300 feet of category 3 wetlands (p. 23 of the forest plan). **Response:** FW-GDL-RMZ-14 provides direction to avoid construction of new roads in the inner riparian management zone for wetlands (which are now category 4 in the forest plan). Prohibiting construction within 300 feet of wetlands is not considered necessary to provide sufficient protection to wetland features. Refer to the analysis in the riparian management zone section 3.2.10 of the final EIS for details.

48. Rationale is needed for many of the objectives, such as FW-OBJ-WTR 01 through 04, FW-OBJ-CWN 01, and FW-OBJ-RMZ 01. The plan should provide an evaluation of various current conditions so the degree to which the objectives will achieve the desired conditions is clear. Without this information, it is impossible to understand if the objectives and standards are adequate. Although there are some additional standards in the revised draft plan compared to the scoping draft, additional standards and requirements are needed to ensure the plan will protect water quality and sustain other important forest resources. Standards and requirements for minimum stream flows, sediment, tree cutting in riparian areas, etc., were included in the current forest plan and should be retained in the new plan. **Response:** The objectives are based upon the Forest's capacity to complete work as well as what is needed on the ground. For example, FW-OBJ-WTR-03 states the objective of reconnecting 10 to 20 miles of habitat in streams disconnected by roads or culverts. This may seem like a low number (based upon comments the Forest has received), but there is little work left to do on the Forest in terms of providing fish passage for bull trout because no culvert barriers that block spawning reaches remain for this species.

Plan components have been developed to cover the areas of concern in this comment, although they are not always standards:

FW-DC-WTR-08: "In-stream flows are sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows are retained. Streamflow regimes maintain riparian ecosystems, and natural channel and floodplain dimensions. Stream channels transport sediment and woody material over time while maintaining reference dimensions (e.g., bankfull width, depth, entrenchment ratio, slope, and sinuosity)."

FW-STD-RMZ-06: "Vegetation management shall only occur in the inner riparian management zone in order to restore or enhance aquatic and riparian-associated resources. Exceptions may occur as long as aquatic and riparian-associated resources are maintained. Exceptions shall be limited to (1) non-mechanical treatments such as prescribed fire, sapling thinning, or hand fuel reduction treatments; (2) mechanical fuel reduction treatments in the wildland-urban interface within 300 feet of private property boundaries; or (3) treatments that address human safety hazards (e.g., hazard trees) adjacent to infrastructure or within administrative or developed recreation sites."

The forestwide infrastructure guidelines (FW-GDL-IFS) address many sediment concerns:

03 “Roads, skid trails, temporary roads, and trails should have water drainage systems that possess minimal hydrological connectivity to waterbodies (except at designated stream crossings) to maintain the hydrologic integrity of watersheds and protect them from the delivery of water, sediment, and pollutants.”

04 “To reduce the risk to aquatic resources when decommissioning roads, making roads impassable, or storing roads, roads should be left in a hydrologically stable condition, e.g., drainage off roads should be routed away from resources and landslide prone areas and towards stable areas of the forest floor to provide filtering and infiltration.”

05 “Prior to placing physical barriers such as berms on travel routes (e.g., roads, skid trails, temporary roads, or trails), the Forest should ensure that road drainage features are in place to protect aquatic and other resources.”

06 “To maintain and/or improve watershed ecosystem integrity and reduce road-related mass wasting and sediment delivery to watercourses, new and relocated roads, trails (including skid trails and temporary roads), and other linear features should not be located on lands with high mass wasting potential.”

07 “To maintain free-flowing streams, new, replacement, and reconstructed stream crossing sites (culverts, bridges, and other stream crossings) should be designed to prevent diversion of stream flow out of the channel in the event the crossing is plugged or has a flow greater than the crossing was designed for.”

08 “When constructing or reconstructing trail and road fords, measures to harden the stream bed, banks, and approaches for new trail and road fords should be included in project design in order to maintain channel stability and reduce sediment delivery to watercourses.”

09 “To protect water quality, maintenance activities such as road blading and snowplowing on existing roads, should not side-cast into or adjacent to waterbodies. When plowing snow, breaks should be designed in the snow berms to direct water off the road.”

10 When constructing or reconstructing roads, drainage should be routed away from potentially unstable channels, fills, and hillslopes to reduce sediment delivery into streams.

Aquatics—General

Comment (letter numbers 2940, 3097)

A desired condition in the South Fork geographic area, GA-SF-DC-05, cannot be met in that non-native fish populations are not absent. Many of the wilderness and non-wilderness lakes and some streams in the South Fork of the Flathead had fish introduced to fishless lakes, and this continues to be done. So, there are non-native fish stocked into originally fishless lakes that provided fishing opportunities at the expense of the native amphibians and other aquatic life in those lakes.

Vol. 1 of the draft EIS, p. xii: Does the term “wildlife” include fish as a significant issue?

Response

The Forest, in cooperation with MFWP, has been chemically treating high mountain lakes since 2006 to remove non-native fish. This project was completed in September 2017, and although some degree of hybrids may remain in streams below the lakes, hybrid genes will be removed

over time through spawning with genetically pure fish. The only non-native fish population that remains is grayling in Handkerchief Lake.

Yes, the term “wildlife” is inclusive and includes fishery issues.

Aquatics—INFISH

Comment (letter numbers 2904, 3094)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest’s draft plan weakens INFISH’s protections, exacerbating the threats to both the survival and the recovery of bull trout and other native fish. The Forest puts forth mostly guidelines and some standards to maintain riparian management zones and stream processes and function and deemphasizes numerical riparian management objectives. The draft plan also eschews watershed analysis and data collection in favor of multiscale analysis relying on existing data from a variety of management scales.
2. The Forest’s draft plan replaces INFISH’s measurable goals with conditions that are generally not required but merely desired. For example, INFISH provides the riparian goal of having “water quality that provides for stable and productive riparian and aquatic ecosystems” (INFISH, A-1). The draft plan includes a few desired conditions for watersheds that mention water quality, but they do not capture INFISH’s goal of providing for stable and productive riparian and aquatic ecosystems. Because of the focus on long-term water quality impacts instead of short-term water quality impacts, bull trout could go extinct under the draft plan. Furthermore, there is a key distinction between INFISH’s use of the phrase “stable and productive” versus the draft plan’s use of able “to respond and adjust to disturbances.”
3. The Forest’s draft plan largely lacks measurable, mandatory imperatives. It replaces specific riparian management objectives, riparian habitat conservation areas, and standards with vague, primarily discretionary direction. It defines a standard as a “mandatory constraint on project and activity decision making,” whereas a guideline is a “constraint on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met.” This means that the standards are often not mandatory constraints and are instead discretionary goals in disguise. Moreover, the draft plan’s standards and guidelines may fail to ensure that “riparian-dependent resources receive primary emphasis,” as specified in INFISH. None of the standard in the draft plan should provide discretion or flexibility where INFISH provided a mandatory requirement; the draft plan has diluted INFISH’s standards.
4. The Forest Service states that the USDA Forest Service Northern Region’s Aquatic and Riparian Conservation Strategy (ARCS) replaces INFISH for the maintenance and restoration of watersheds in the Forest and that it is incorporated and integrated throughout the Flathead’s forest plan. However, this strategy is not explained or provided anywhere. If it indeed has been incorporated and integrated, it is unclear where that has happened or to what effect.
5. The draft plan does not provide for water quality. INFISH’s riparian goal (1) is to provide for water quality that provides for stable and productive riparian and aquatic ecosystems. The draft plan contains three desired conditions for watersheds that touch on the issue of water quality. However, it lacks the goal of providing for “stable and productive riparian and aquatic ecosystems.” In the draft plan, FW-DC-WTR-01 states that watersheds and aquatic ecosystems should retain “inherent resilience to respond and adjust to disturbances without long-term,

adverse changes to their physical or biological integrity.” FW-DC-WTR-04 is for water quality that is “reflective of the climate, geology, and natural vegetation of the area. Stream habitat features across the forest, such as large woody material, percent pools, residual pool depth, median particle size, and percent fines are within reference ranges as defined by agency monitoring.” FW-DC-WTR-06 states that water quality “meets or exceeds applicable state water quality standards, fully supports beneficial uses and meets the ecological needs of native aquatic and riparian associated plant and animal species.” These desired conditions are significant changes, as “stable and productive” in INFISH likely means more than simply able to respond to disturbances and goes above and beyond simply meeting or exceeding legally required water quality standards. Thus, the draft plan must capture INFISH’s intent of providing for stable and productive habitats for native fish.

6. The draft plan does not provide for the productivity of plant communities. INFISH’s riparian goal is to support the productivity of native and desired non-native riparian plant communities. However, the draft plan does not mention productivity. The Forest should mandate site-appropriate productivity of riparian plant communities to support aquatic and riparian species.

7. Stream temperatures are not being protected for bull trout. The draft EIS determined that temperature is not a concern because “the established RHCAs [riparian habitat conservation areas] have preserved streamside vegetation that shades streams [and because the] Flathead NF [National Forest] does not clear forest within RHCAs and future RMZs [riparian management zones] would also not clear forest canopy along streams” (draft EIS, p. 101). However, this determination is likely incorrect because, as discussed in the section addressing riparian management zones, vegetation management in riparian areas would be allowed in more circumstances under the draft plan than under current management direction.

8. The forestwide direction that applies to the conservation watershed network fails to include standards that are more stringent than those for all other riparian areas.

Response

In addition to the responses to each concern below, refer to section 3.2 of the final EIS for expanded analysis and discussion related to INFISH, best available scientific information, and the effects of the alternatives.

1. Based on the direction of the 2012 planning rule, the Forest is emphasizing desired conditions that project proposals must be consistent with. This approach will improve the Forest’s planning process and, reduces the dependence on standard and guidelines direction. The plan components strengthen riparian protections by extending riparian management zones for wetlands over 0.5 acre in size to 300 feet and for intermittent streams to 100 feet. FW-STD-RMZ-06 restricts management activities within the inner riparian management zone, which is 150 feet for perennial and fish-bearing streams unless activities restore or enhance aquatic or riparian resources. The inner riparian management zone provides for the protection of important stream and riparian processes such as shade, bank stability, and large wood recruitment, and the best available science indicates that these processes are protected within one tree length (Gordon H. Reeves, Pickard, & Johnson, 2016). Multiscale analysis is not a requirement but a tool that considers the evaluation of existing conditions, factors limiting aquatic species populations, resource risks, management needs, restoration opportunities, and interagency coordination. It helps determine the need and scope if vegetation management projects enter riparian management zones.

2. INFISH did not distinguish between standards and guidelines and had eight riparian goals. The forest plan does not have goals but has desired conditions. The Forest's desired conditions for watersheds and riparian management zones capture the intent of the goals that are in INFISH. Desired conditions under the rule have essential cultural, ecological, economic, and social characteristics. The 2012 planning rule does not have goals but has desired conditions. Desired conditions under the rule have essential characteristics: The set of desired conditions are sustainable and:

1a. Describe what is desired for ecosystem integrity; air, soil, and water quality; riparian areas; social and economic sustainability; ecosystem diversity; additional species-specific plan components if needed; and multiple uses (required topics are listed in section 23, exhibit 01 of this Handbook);

1b. Are attainable through integrated resource management for multiple uses (§ 219.10(a)); and

1c. Contribute to social and economic sustainability (§ 219.8(b)); including:

(1) Social relationships, traditions, culture, and activities that connect people to the plan area where they recreate, hunt, visit, or work for their livelihood.

(2) The capability of society to produce and consume goods and services, including jobs, market benefits, and nonmarket benefits derived from the plan area.

As stated in 1b above, desired conditions must be attainable, the same as the INFISH goal that was quoted in the comment. More specifically, for water quality, FW-DC-WTR-06 requires that "water quality be met to fully support designated beneficial uses," which meets State requirements.

3. Under the 2012 planning rule, a standard is defined as a mandatory constraint on project and activity decisionmaking, established to help achieve or maintain the desired condition or conditions to avoid or mitigate undesirable effects or to meet applicable legal requirements (36 CFR 219.7(e)(1) (iii)). There is no flexibility for deviating from a standard unless a site-specific amendment is adopted.

A guideline is a constraint on project and activity decisionmaking that allows for departure from its terms so long as the purpose of the guideline is met (§ 219.15(d)(3)). Guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iv)).

Guidelines serve the same purpose as standards, but they differ from standards in that they provide flexibility in defining compliance, whereas standards are absolute constraints. Guidelines are not absolute; they allow for departure from their terms so long as the underlying purposes are met.

INFISH did not distinguish between standards or guidelines, but the 2012 planning rule does. The riparian management objectives that the Forest carried forward from INFISH, along with indicators the Forest has been measuring using PACFISH/INFISH Biological Opinion (PIBO) monitoring protocol, have been moved to the monitoring section and are based on best available scientific information. The introduction to the monitoring program, chapter 5 of the forest plan,

includes a discussion of how the placement of riparian management objectives in the monitoring section allows for better tracking of trends across the Forest.

4. The USDA Forest Service Northern Region's draft Aquatic and Riparian Conservation Strategy (ARCS) is in the process of being developed. One result of the ARCS has been the inclusion of additional plan components, including 300-foot riparian management zones for wetlands in order to provide greater riparian protection. Although there may be differences between the draft ARCS and the forest plan, the Forest's plan components are aligned with the strategy.

5. As noted in the comment, the draft forest plan does contain several desired conditions that address water quality that are attainable. In addition, standard FW-STD-WTR-02 requires that best management practices be incorporated in project plans to protect beneficial uses. Regarding INFISH direction to provide for stable and productive habitat for all stream reaches at the same time, the current understanding of best available scientific information no longer supports this concept.

6. Although the forest plan does not specifically mention the term "productivity" with regard to plant communities, the Forest believes that the expansion of concepts in the 2012 planning rule that is addressed by the following plan components meets the original productivity intent described in INFISH: FW-DC-WTR-03 states that "habitat and ecological conditions support self-sustaining populations of native aquatic and riparian-associated plant and animal species." In addition, FW-DC-RMZ-01, 03, 04, and 05 provide for plant communities within riparian areas.

7. Stream temperature is addressed by FW-STD-RMZ-06, which restricts vegetation management activities within the inner riparian management zone; the inner zone has been shown to have the most influence on temperature. A study that modeled the effects of riparian reserves on stream temperature in Washington found that the first 10 meters were the most important in protecting stream temperature and that buffers greater than 30 meters did not appreciably lower stream temperatures (Sridhar, Sansone, LaMarche, Dubin, & Lettenmaier, 2004). A study on headwater stream microclimate by Anderson et al. (2007) found that the first 10 meters had the most effect on microclimate above the stream. A review of studies by Moore et al. (2005) suggested that a riparian reserve that was the width of one tree height was likely large enough to protect the ecological processes that control stream temperature.

8. Riparian standards and guidelines are the same under all alternatives across all management areas and for the conservation watershed network. The Forest believes that these plan components are sufficient to provide for riparian habitat and fish habitat conditions based upon the PIBO monitoring related to INFISH since 1995. The conservation watershed network is intended to address the road network within important fish watersheds by stormproofing and replacing culverts on existing roads.

Aquatics—Models

Comment (letter numbers 290, 2765)

Neither the draft forest plan nor the draft EIS analyze how the alternatives will impact the primary constituent elements for bull trout (that will also benefit other native fish).

The Forest has used outdated sediment, watershed, and fish models; it should apply a proper sedimentation model, as well as watershed and fisheries models, both forestwide and to each timber sale and thinning project

Response

Primary constituent elements have been identified for “critical habitat” for bull trout and are addressed in the Forest’s biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) and the USFWS biological opinion (USFWS, 2017b).

The Forest used published temperature modeling utilizing Flathead National Forest data (Daniel J. Isaak et al., 2015) to identify cold water refugia where native fish and cold water are predicted to persist in the face of climate change and also to identify the conservation watershed network. Other models, such as the Water Erosion Prediction Project and the Geomorphic Road Analysis and Inventory Package, are most appropriately used at the project level to determine the effects from proposed activities on water quality and fisheries at a finer scale.

Aquatics—Municipal Watersheds**Comment** (letter number 2994)

Organic loading may occur to waterbodies, so the final EIS should provide an assessment of the potential for organic loading impacts to drinking water supplies associated with municipal watersheds.

Project activities may impact groundwater, and the final EIS should provide additional information characterizing groundwater resources in the planning area as a basis for analysis of potential impact and appropriate protections for groundwater supplies. The final EIS should include a map of all groundwater resources of the Flathead National Forest.

The draft EIS discusses Haskill Basin as a municipal water supply watershed but does not indicate whether this is the only municipal supply watershed on the Forest or what other public drinking water supply sources exist.

Response

Public water supplies and source water assessments can be found on the Montana Department of Environmental Quality website:

<http://svc.mt.gov/deq/wmadst/default.aspx?requestor=DST&type=SWP>.

Groundwater maps can be viewed on Groundwater Information Center websites <http://mbmggwic.mtech.edu/> and thus were not included in the draft EIS. There is only one municipal watershed on the Flathead National Forest, and that is the one in Haskill Basin that provides water to the City of Whitefish. A collaborative working group is currently addressing fuels management as well as protection of water quality in the watershed. A description of municipal watersheds and source water protection areas has been added to the final EIS, along with an analysis of the effects of the forest plan revision on these resources.

Aquatics—Non-Native Invasive Species**Comment** (letter number 2855)

There needs to be forestwide direction for awareness, prevention, and control of aquatic invasive species such as is provided by the desired condition that “the general public has a basic understanding of wetlands, stream ecosystems, and watersheds due to educational and informational programs” and the guideline that “information and preventive measures on aquatic

invasive species should be included at water based recreation sites, e.g., boat ramps to inform the public.”

Response

Thank you for your support.

Aquatics—Riparian Management Objectives

Comment (letter numbers 290, 2601, 2904)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Riparian management objectives from INFISH are not being retained.
2. In the draft forest plan, the Forest Service changed the test by which it determines whether it is meeting its objectives. Under INFISH, to “retard the attainment of RMOs [riparian management objectives]” means “to slow the rate of recovery below the near natural rate of recovery if no additional human caused disturbance was placed on the system” (INFISH Finding of No Significant Impact, A-3). The draft forest plan simply requires that any of the plan’s benefits eventually occur in the “long term” (FW-STD-WTR-03).
3. The standards related to riparian management zones in the draft forest plan are unenforceable. Even the “mandatory” standards are heavily infused with discretion, making them vague and unenforceable.
4. INFISH’s RF-2 directs agencies to meet riparian management objectives to avoid effects to fish by completing watershed analyses prior to road or landing construction in riparian habitat conservation areas in priority watersheds, minimizing road and landing locations in riparian habitat conservation areas, implementing a road management plan or travel management plan with specified elements, avoiding road sediment delivery to streams, avoiding disruption of natural hydrologic flow paths, and avoiding side-casting of soils or snow (prohibited in riparian habitat conservation areas). According to FW-GDL-RMZ-03 in the draft forest plan, the Forest Service should “generally avoid new road construction, including temporary roads, in riparian management zones except where necessary for stream crossings.” Even for subwatersheds in the conservation watershed network, FW-GDL-CWN-01 only provides that “net increases in stream crossings and road lengths should be avoided in RMZs [riparian management zones] unless the net increase improves ecological function in aquatic ecosystems.” The draft plan also entirely does away with the requirement for a road management plan.
5. INFISH’s RF-3 directs agencies to determine each road’s effect on native fish and meet riparian management objectives to avoid adverse impacts. The draft plan does not target existing roads to reduce effects on native fish.
6. INFISH’s RM-3 directs agencies to address riparian management objectives attainment and effects on inland native fish in recreation management plans. The draft forest plan does not mention recreation management plans, despite some forms of recreation, such as off-road vehicle use, that have a potentially huge impact on riparian areas.
7. INFISH’s RA-3 directs agencies to apply herbicides, pesticides, and other toxicants and chemicals in a manner that does not prevent riparian management objectives attainment and that

avoids adverse effects to native fish. The draft plan's FW-STD-IFS-05 prohibits direct chemical application to watercourses during dust abatement applications on roads. FW-GDL-RMZ-04 instructs that "aerial application of chemical retardant, foam, or other fire chemicals and petroleum should be avoided in mapped aerial retardant avoidance areas (see glossary) in order to minimize impacts to the RMZ [riparian management zone] and aquatic resources." No other standards or guidelines address the application of herbicides, pesticides, or other toxicants or chemicals in riparian areas, and these standards and guidelines are less protective than INFISH.

Response

1. The Forest's review of the literature found that applying numerical standards in riparian management objectives as a target for every stream reach to attain at the same time in a basin is no longer supported by the best available scientific information. Streams are very dynamic due to natural events such as fires, flooding, debris flows, and avalanches. Trying to manage them to a set standard creates difficulties.

Values identified by researchers in the late 1980s and early 1990s for stream processes were included as riparian management objectives in PACFISH and INFISH (USDA, 1995a, 1995b). The resulting regulations were also based on protecting these individual processes. Regulatory frameworks in use today (NMFS, 1996; USFWS, 1998) identify the matrix of pathway indicators and set numerical ranges describing what healthy habitat should be. Several of the pathway indicators correspond to PACFISH/INFISH riparian management objectives. The portion of numerical ranges that correspond with professional opinion concerning high-quality habitat is called "proper functioning condition" in the regulatory frameworks. Over time, an expectation has been created that all watersheds can be managed to achieve proper functioning condition at the same point in time (G. H. Reeves & Duncan, 2009). A review by Kershner and Roper (2010) discussed the results of monitoring eight riparian management objectives and their related matrix of pathway indicators rankings and noted that many locations in unmanaged watersheds do not meet proper functioning condition. Several years into this PIBO monitoring effort, Kershner and Roper (2010) also disclosed that the eight riparian management objectives monitored in 726 reference and managed subwatersheds had never all been properly functioning in one watershed at the same time.

Managing for a single process with seemingly simple-to-achieve objectives can have undesirable consequences. Holling and Meffe (1996) discussed the concept of "command and control" to deal with the pressures of increasing human populations on declining natural resources. They describe this outlook as follows: "The expectation is that the solution is direct, appropriate, feasible, and effective over most relevant spatial and temporal scales." They go on to say,

The command-and-control approach implicitly assumes that the problem is well-bounded, clearly defined, relatively simple, and generally linear with respect to cause and effect. But when these same methods of control are applied to a complex, nonlinear, and poorly understood natural world, and when the same predictable outcomes are expected but rarely obtained, severe ecological, social, and economic repercussions result. (p. 329)

The authors caution that dependence on the command-and-control approach leads to ever greater dependency but rarely creates sustainable solutions.

If the command-and-control approach does not work, what will? Hiers et al. (2012) discuss the challenges of ecological restoration from the standpoint of "past as prologue" and the possibility that the approach will not be effective with the current and future conditions of climate change,

exotic introductions, and broad human perturbations. They discuss a method of restoration planning that quantifies changes in reference conditions and at the same time measures change in restoration sites. This method of using dynamic reference conditions provides a method to guide restoration when there is no longer an analogue. In Hiers et al. (2016), the authors ask the question, “Can precision be a prescription for failure?” Like the concerns raised by Holling and Meffe, Hiers et al. (2016) raise concerns about restoration actions that are precisely designed to meet an idealized condition regardless of nearby natural conditions that are different. Specifically, they speak to the widespread implementation of naturally designed channels, often built to exact standards at significant expense, that have in turn failed to perform as expected. Of greater concern to Hiers et al. (2016) is the possibility that overly specific targets can reduce variability at different scales and that, in turn, the loss of variability can reduce environmental resilience. Reeves et al. (2016) discuss the concept of ecological tradeoffs. They address the reality that ecological processes on the landscape are inextricably linked and that by maximizing attainment for one process, restoration practitioners could diminish the conditions for other processes.

Based upon the science, the Forest has chosen not to retain numerical standards as objectives. Instead, the Forest will monitor the metrics to determine trends in habitat condition.

2. FW-GDL-WTR-09 is specific to source water areas such as Haskill Basin, which supplies water to the City of Whitefish, and it discusses short-term versus long-term effects. Riparian management objectives are no longer applicable; see the comments and responses under Aquatics—Riparian Management Zones.

3. Standards are designed to be enforceable and thus the word “shall” is used.

4. The Road Management Rule was published in the Federal Register on January 12, 2001. The rule “removes the [prior rule’s] emphasis on transportation development and adds a requirement for science-based transportation analysis. . . . The intended effect of this final rule is to help ensure that additions to the National Forest System network of roads are those deemed essential for resource management and use; that construction, reconstruction, and maintenance of roads minimize adverse environmental impacts; and finally that unneeded roads are decommissioned and restoration of ecological processes are initiated” (66 Federal Register 3206).

Subpart A of the Road Management Rule pertains to the administration of national forests’ transportation systems. In part, subpart A requires each unit of the NFS to (1) identify the minimum road system needed for safe and efficient travel and for the protection, management, and use of NFS lands (36 CFR 212.5(b)(1)) and (2) identify roads that are no longer needed to meet forest resource management objectives (36 CFR 212.5 (b)(2)). In determining the minimum road system, the responsible official must incorporate a science-based roads analysis at the appropriate scale. According to Forest Service policy (Forest Service Manual 7710.3), the travel analysis process defined in Forest Service Handbook 7709.55, chap. 20, serves as the “science-based roads analysis” required by 36 CFR 212.5 (b)(1). Travel analysis is not a decisionmaking process. Rather, travel analysis informs decisions related to the administration of the national forest transportation system and helps to identify proposals for change (Forest Service Manual 7712).

The Flathead National Forest completed its Travel Analysis Report in 2014 (USDA, 2014c), and it was considered in the development of plan components. This broad-scale analysis encompasses all existing NFS roads on the Forest. The report provides an assessment of the road infrastructure and a set of findings and of opportunities for change to the transportation system. This report does not change or modify any existing NEPA decisions but should help to inform Forest managers as

they identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of NFS lands.

5. The Forest's Travel Analysis Report (USDA, 2014c), which addresses the effects of road segments on fish, and FW-OBJ-CWN-01 will both help address existing roads within important fish watersheds. FW-OBJ-CWN-01 reads as follows: "The conservation watershed network is the highest priority for restoration actions for native fish and other aquatic species. The stormproofing of 15 to 30 percent of the roads in the conservation watershed network is prioritized, as funding allows, to benefit aquatic species (e.g., bull trout)."

FW-OBJ-IFS-01 also addresses existing roads to benefit bull trout: "01 Decommission or place into intermittent stored service 30 to 60 miles of roads. Priorities are roads causing resource damage in priority watersheds and/or roads located within desired nonmotorized recreation opportunity spectrum settings and/or roads within bull trout watersheds."

6. In response to comments on the attainment of riparian management objectives, see the comments and responses under Aquatics—Riparian Management Zones. Also, FW-GDL-REC-06 addresses recreation facilities within riparian areas to prevent impacts on riparian and aquatic resources: "To protect fishery resources and riparian-associated plant and animal species, new developed recreation sites should not be located within the inner riparian management zone except when it is health and safety or water-related, such as boat ramps and fish platforms. Structures should be developed with an aquatic specialist so that fishery and riparian-associated plant and animal species are protected."

7. FW-STD-RMZ-04 provides the requested guidance: "Herbicides, pesticides, and other chemicals shall not be applied within riparian management zones. Exceptions may be made if chemical use is necessary to maintain, protect, or enhance aquatic and riparian resources or to restore native plant or animal communities."

Aquatics—Riparian Management Zones

Comment (letter numbers 264, 290, 324, 2574, 2855, 2869, 2875, 2901, 2904, 2940, 3009, 3021, 3094)

Note: The Forest received many comments related to riparian management zones. Responses under this area of concern are located immediately after each specific comment.

1. The Forest should protect and conserve riparian areas. Water and riparian habitats must also be protected. The forest plan should retain the INFISH nomenclature of riparian habitat conservation areas. Riparian areas are sensitive and should be "conserved," not "managed." The forest plan needs riparian management areas. The importance of riparian areas and wetlands cannot be emphasized enough. Montana, part of the arid West, frequently faces drought, and yet riparian areas and wetlands provide the greatest biological diversity of any habitats, and so these species habitats must be conserved. The Forest Service states that riparian ecosystems are "rich in bear foods such as skunk cabbage and other herbaceous plants with nutritious bulbs" and notes that grizzly bears and other species of concern are often associated with riparian habitats (draft EIS, p. 56). Given that many of the historic foods of grizzly bears are on the decline or have vanished, aquatic ecosystems must be conserved for grizzly bears and other species. Failure to do so will add to the ongoing threats the Forest Service must consider as part of its grizzly bear recovery criteria. **Response:** The original intent of establishing riparian habitat conservation areas was to restrict management that degraded riparian processes and conditions and to begin restoration. Because both professionals and the general public were confused by the meaning of riparian

conservation habitat area, the Forest changed the name to riparian management zone to clarify the original intent. The Forest has also added a literature review to discuss the kinds of processes that take place in a management area, how restoration activities could interact with those processes, and what activities might be appropriate within the riparian management zone with respect to distance from the water's edge. See section 3.2 in the final EIS.

Riparian areas are protected through the standards and guidelines under riparian management zones. The expansion of riparian management zone wetlands to 300 feet is partly due to the importance of these areas for grizzly bears, Canada lynx, and other wildlife, especially to the need for habitat connectivity across the landscape. The Forest uses the concept of an inner and outer zone because critical functions related to streams and wetlands mainly occur in the inner zone, whereas activities in the outer zone have less of an influence. The inner and outer zones also provide key benefits for wildlife. The plan components for riparian management zones conserve the value of these areas as grizzly bear habitat. Riparian management zones are not suitable for timber production, but if vegetation treatments are proposed to achieve desired conditions, the effects on grizzly bears would be assessed at the project level. Riparian areas do not have their own management area because they will be delineated on the ground during site-specific project analysis, with their minimum widths defined under FW-STD-RMZ-01.

2. The draft EIS fails to analyze the impacts of reducing shade and cover in riparian areas and how that exacerbates the climate change impacts the streams will already be subjected to.

Response: Potential effects from management activities on temperature and shade can be found in section 4.2.10 of the final EIS, subsections "Effects of forestwide direction on riparian areas" and "Effects on riparian areas from timber and vegetation management."

3. Although the Forest may have been trying to allow for greater management flexibility within the riparian management zones, the standards as currently written do the opposite and likely will ensure no management within riparian management zones. The concept of an "inner" and "outer" buffer zone with more restrictions on the inner and less on the outer makes sense. In order for managers to have the flexibility needed to implement this management scheme, the riparian management zone management process cannot be adopted as standards because that would be too restrictive. **Response:** The riparian management zone definitions are standards because of the importance of riparian areas in the landscape to maintaining desired conditions for both aquatic and terrestrial species and habitats. The type of management and its extent within riparian management zones will be determined at the site-specific project level, and the standards and guidelines in the riparian management zone section will set the boundaries for these decisions. Also see the response to comment 1 above.

4. The proposed action provided for some flexibility in applying the appropriate mitigation for the site-specific conditions, but the draft forest plan does not allow for any flexibility and is lacking scientific review of the proposed buffer widths. The way this is written, the buffer width on category 1, 2, and 4 streams is indefinite on slopes over 35 percent unless there is an "inner gorge slope break." This term is not defined in the glossary, so how will it be identified on the ground? Buffers could extend all the way to the ridge top regardless of the distance. A 100-foot riparian management zone on a disconnected intermittent riparian area is unnecessary and would create huge logistical complications to project implementation. The proposed buffer widths are two to three times that of any other land management agency. **Response:** Regarding the widths of riparian management zones next to streams, the interim minimum distances listed for fish-bearing (300 feet) and perennial streams (150 feet) arguably are the most controversial components of the existing strategies. Numerous studies have been completed since the strategies were first

published that investigate how management effects the different ecological processes that are a function of riparian management zones. See the additional discussion and the references to the best available scientific information in the final EIS, section 3.2, subsection “INFISH background,” and also section 3.2.6. Also refer to Thomas (2017) for a discussion of the science associated with INFISH.

Riparian management zones for streams are almost identical to the original riparian habitat conservation area widths that have been in place since 1995, and guidance has been added to clarify the original intent to help project interdisciplinary teams plan and disclose activities within riparian management zones that are consistent with desired conditions and riparian processes. The Forest’s riparian management zone widths are greater than those of Montana Department of State Lands, for example, because the missions of these two agencies are quite different.

5. The concept of the conservation watershed network is a very good concept. FW-GDL-CWN-01 should be rewritten as a standard, stating that “net increases in crossings and road lengths will be avoided in RMZs [riparian management zones].” **Response:** This plan component will remain a guideline because there may be a situation where relocating a road away from a stream may still have to occur in the riparian management zone due to confinement issues. This could lead to an increase in road length, which is the reason for the exception in the guideline.

6. Additional standards and guidelines should be developed to ensure that management activities achieve the desired conditions and objectives for the conservation watershed network, including requiring a watershed analysis prior to constructing roads or landings in riparian management zones within a conservation watershed network. Scientifically based evidence should be part of any decision to allow fire in a riparian management zone within a conservation watershed network. Management activities in the network should not result in any long-term impacts to aquatic habitat. **Response:** The standards and guidelines throughout the water, riparian, infrastructure, and other sections of the forest plan will help achieve the desired conditions for the conservation watershed network. A multiscale analysis during the site-specific planning process will assist in making the determinations mentioned in this comment.

7. The draft plan has a standard stating that vegetation management in the outer riparian management zones cannot result in long-term degradation to aquatic and riparian conditions, but this standard should be written to ensure that it is not subjective and that it includes scientifically based evidence demonstrating that the activity can occur without creating additional risk. Additionally, this standard should be reworded to state that vegetation management can only have short-term effects (effects that occur during, or immediately following, implementation of the activity) and only when management activities support long-term benefits to riparian habitat conservation areas and wildlife and aquatic resources. This will help ensure that shifting from to riparian management zone retains a similar degree of protection as under riparian habitat conservation area and will still allow for some management flexibility. **Response:** The draft forest plan had standard FW-STD-RMZ-04 that addressed long-term versus short-term degradation, but it was difficult to define “degradation” and the time frames. The Forest believes that the standards and guidelines associated with treatments within riparian management zones and with vegetation treatments in general (such as the direction in the Soils section) are sufficient to protect aquatic and riparian values. The Forest has also developed new components that provide direction for vegetation treatments within riparian management zones, such as the following guidelines, all of which are under FW-GDL-RMZ:

08 If tree harvest activities occur within riparian management zones, live reserve trees should be retained (if present) to protect water quality and contribute to forest structural

diversity for aquatic- and riparian-dependent species (e.g., the clearcut harvest method should not be used). Because site and forest conditions vary considerably, the sizes, species, density, and pattern of reserve trees would be determined at the project level.

09 If new openings are created in riparian management zones through even-aged regeneration harvest or fuel reduction activities, each created opening's distance to cover (see glossary) should not exceed 350 feet to provide wildlife habitat structural diversity, connectivity, and cover.

10 If harvest activities occur within riparian management zones, all snags greater than or equal to 12 inches d.b.h. should be retained within the harvest area to contribute towards more diverse forest structure and desired habitat conditions by providing higher snag and downed wood densities (once the snags fall) as compared to areas outside riparian management zones. Exceptions to this guideline may occur where there are issues of human health and safety (i.e., developed recreation sites, sites adjacent to landings) or where decreased amount of wildland fuels are desired to protect communities and community assets (i.e., within the wildlife-urban interface). Due to the high variability in snag and landscape conditions created by wildfire, exceptions may also be considered in areas burned by stand-replacing fire based on a site-specific analysis.

The following guidelines apply to the entire riparian management zone for category 1, 2, and 3 streams and for fens/peatlands:

- 12** Vegetation management activities should be designed to include one or more of the following measures to avoid ground disturbance that may deliver sediment and reduce the risk of alteration of hydrologic processes:
- ◆ No ground-based logging equipment unless occurring during suitable winter logging periods;
 - ◆ Full suspension yarding;
 - ◆ Falling and yarding methods that promote retention of understory vegetation and other groundcover
- 13** If prescribed fire activities occur, ignition should take place outside the riparian management zone and fire allowed to naturally spread into the riparian management zones. The intent is to allow fire to enter and cross the zone at predominantly low to moderate intensity, and create vegetation conditions consistent with natural fire regimes.

The following guidelines apply only to the inner riparian management zone for categories 4a and 4b (except fens/peatlands):

- 14** To reduce the risk of sediment input and to protect the integrity of aquatic and riparian ecosystems, new landings and new roads (including temporary roads) should not be constructed. Exceptions for temporary roads and landings may be considered only where site-specific analysis and implementation of mitigation measures are determined to be appropriate by an aquatic resource specialist to protect aquatic and riparian resources.
- 15** If vegetation treatments occur in the inner riparian management zones, they should be designed to include one or more of the following measures to avoid ground

disturbance that may deliver sediment to wetlands and reduce the risk of alteration of hydrologic processes:

- No ground-based logging equipment unless occurring during suitable winter logging periods;
- Full suspension yarding;
- Falling and yarding methods that promote retention of understory vegetation and other groundcover

8. The riparian management zone width for category 2 streams that are hydrologically connected to fish-bearing streams should be the same as category 1 streams because these channels can potentially deliver significant amounts of sediment to connected fish-bearing reaches and can also affect thermal conditions in the fish-bearing reaches. Therefore, the sediment filtering and shade benefits of wider riparian habitat conservation areas in category 2 streams can benefit fish in connected reaches. A fish-bearing stream is only as healthy as its entire watershed; this approach would be more consistent with the watershed context of the draft forest plan and the 2012 planning rule. **Response:** The Forest agrees with this concern about perennial streams. Although the Forest is not increasing the overall width of the riparian management zone to the 300-foot distance of category 1 streams, as recommended in the comment, the Forest is classifying the entire width of category 2 streams as “inner,” so a proposed project will need to meet the direction for the inner standard provided in FW-STD-RMZ-06.

9. The draft forest plan (p. 17) states that “Vegetation management within RMZs [riparian management zones] is allowed . . . RMZs are not ‘no management zones.’” The underlying premise of this management direction appears to be looking for reasons to apply treatments to vegetation in riparian areas. The Forest should use caution and restraint here because these areas are critically important for many species of terrestrial wildlife. Connectivity is also important for aquatic species. Increasing riparian habitat conservation area width is a positive step if the buffers remain inviolate. It is clear, however, that this is not the intent. The intent is to create inner and outer zones, thereby decreasing the currently protected riparian habitat conservation areas. This is a step in the wrong direction for the protection of connectivity. These buffers also provide crucial habitat for terrestrial species; logging or thinning them can have negative consequences for species like the fisher. **Response:** Regarding wildlife connectivity, see section 3.7.4, subsection “Aquatic, wetland and riparian habitats,” and section 3.7.6, subsection “Wildlife habitat connectivity,” in the final EIS for discussion of the importance of riparian management zones to wildlife and habitat connectivity. The Forest agrees that riparian areas are important areas, and thus the forest plan has many standards and guidelines designed to protect them. Caution as well as the purpose and need to enter riparian management zones will be the focus during site-specific project planning.

10. The draft EIS (p. 80) discusses the completion of multiscale analyses prior to the construction of new roads or landings within riparian habitat conservation areas and prior to salvage cutting in riparian habitat conservation areas as if this is already a requirement for the Forest Service, when, in fact, it is not. The Forest Service should add a standard that requires multiscale analyses in these situations in the future. **Response:** There is no standard for a multiscale analysis to be completed for riparian areas. A multiscale analysis is a tool that will help inform any decision related to entering a riparian management zone. The concept is not to only look at the reach level but to look at a broader scale to consider the importance of that riparian area to the watershed for species such as bull trout or grizzly bears. There are many factors and scales to consider; see a more detailed discussion of this in appendix C of the forest plan.

11. Given that riparian areas are natural corridors that often encompass broad elevational gradients, they are an important component of landscape connectivity. The Forest's choice of increasing the protection for riparian management zones along its flowing waters so that all intermittent streams receive 100-foot-wide protection zones and all wetlands, lakes, and ponds are categorically 300-foot riparian management zones is a good decision, as is the forest plan's limit on future road crossings and total road lengths in riparian management zones. The increase in riparian management zones and increased emphasis on vegetation structure and composition will be beneficial to the Forest's resources. **Response:** Thank you for your commendation.

12. The draft plan narrows the descriptions of the categories of riparian management zones from INFISH's categories of riparian habitat conservation areas in the following ways, potentially making each category smaller: it removes "or to the outer edges of riparian vegetation" language from the category 1 riparian management zone description; it removes "or to the outer edges of the 100-year floodplain" language from the category 2 riparian management zone description; and it removes "or to the extent of moderately and highly unstable areas" language from the category 3 riparian management zone description. **Response:** This language is in the forest plan under FW-STD-RMZ-01.

13. The draft EIS (vol. 1, p. 110) asserts that the greatest effects on riparian resources are in alternative C because of the "amount of acres in the suitable base" and that alternative D would have the least risk. This is counterintuitive and squarely contrary to figure 15 (draft EIS, vol. 1, p. 148), which shows that alternative C has the fewest acres of regeneration harvest and alternative B has the greatest acreage disturbance. **Response:** It is indeed counterintuitive because one would think that the alternative that has the most wilderness would be the best for riparian resources. However, the text quoted is from the section on the effects from timber and vegetation management, and in that section the effects were based on the assessment that more acres would be harvested under alternative C than alternative D but at less intensity. This is because one of the objectives of the Spectrum model (which is the model that projects vegetative treatments and timber volume outputs, see appendix 2 of the final EIS) is to provide a sustainable level of timber products in a cost-efficient manner. Less intensive harvest methods (for example, a commercial thin) typically produce less timber volume per acre than more intensive harvest methods (for example, a seed tree harvest). Thus, it would require more acres of treatment to produce the same output of timber volume. Ultimately, decisions on the methods of treatment would be made at the site-specific level. It is difficult to assess the impacts on riparian areas as well as other resources at the programmatic level since project-level proposals may or may not enter riparian management zones, and the types of treatments applied are site-specifically determined.

14. The proposed plan falls short in the case of the northern bog lemming. The draft EIS does an adequate job of delineating areas where the bog lemming has been located. The plan, however, relies again on riparian management zones to provide connectivity for this species. Nowhere is there an analysis of how many bog lemming populations are connected by continuous riparian management zone areas. Nothing is said about the potential for widely dispersed populations to be connected. The 2012 planning rule and NEPA demand more. These analyses should be completed and either the riparian management zone rules should be added to in support of bog lemming connectivity or the extent and strength of the current strategy should be evaluated. **Response:** The 2012 planning rule and NEPA require the Forest to consider the best available scientific information. The Forest knows of no specific information concerning what bog lemmings may require for connectivity and does not know of any scientific evidence demonstrating that bog lemming populations must be connected by continuous riparian management zone areas. Their distribution is apparently spotty even in the center of their range in

central Canada. Their home ranges may be quite small, but at least some species of small murid rodents exhibit good dispersal ability that may take them several kilometers from their natal area (Maier, 2002) (data summarized in NatureServe Explorer at <http://explorer.natureserve.org> October 2015).

15. The new riparian management zones envisioned in the draft EIS, formerly known as riparian habitat conservation areas, contain some important improvements but also some serious retreats that could negatively impact grizzlies and other wildlife (see vol. 1, pp. 56-57). The Forest's decision to designate 427,320 acres (over the current 327,787 acres) as riparian management zones is a sound management decision and should be retained. **Response:** Pages 56-57 of volume 1 of the draft EIS say nothing about serious retreats that could have negative impacts on grizzlies and other wildlife, so the Forest is not able to respond to this comment.

16. Degraded riparian areas and wetlands on the Flathead National Forest harm habitats and, therefore, indirectly harm grizzly bears. As a result of human manipulation over the past 100 years, including changing stream channels, timber cutting, road building, dams, changing fire regimes (draft EIS, pp. 50-51), and livestock grazing, the water quality on the Forest has been degraded, harming fish and other aquatic species and resulting in sand, silt, sedimentation, and pollution (draft EIS, p. 52). Pollutants on the NCDE include PCBs, mercury, nitrogen, and phosphorus. Wetlands and riparian corridors are key habitats that support grizzly bears. Because these are degraded in places on the Forest and portions of the NCDE, the Forest Service must account for these ongoing threats to grizzly bears as part of its recovery criteria. **Response:** The Forest does not know of any scientific evidence demonstrating that the condition of riparian areas and wetlands on the Forest is harming the NCDE grizzly bear population. As stated on pages 272-280 and 400 of volume 1 of the draft EIS, the Forest recognizes the importance of riparian areas and wetlands for wildlife, including for grizzly bears. Plan components for riparian management zones in the forest plan support their function as key habitats.

17. The proposed riparian management zone widths will help protect clean water, healthy habitat, native fish and wildlife populations, and additional functions provided by riparian areas, streams and rivers, lakes, ponds, and wetlands. However, some of the management activities proposed to be allowed in riparian management zones will compromise their health and functions, so the Forest should include additional riparian management zone objectives for water temperature, woody debris, bank stability, and sediment. **Response:** The riparian management objectives carried forward from INFISH, along with indicators that the Forest has been measuring using PIBO monitoring protocol, are included in chapter 5 of the forest plan (the monitoring section), based on the best available scientific information. See section 3.2 for an explanation of how the Forest's placement of riparian management objectives in the monitoring section will help in tracking trends across the Forest. The forest plan does not contain riparian zone objectives for water temperature, woody debris, bank stability, and sediment, but it does have FW-DC-WTR-04: "Instream habitat conditions for managed watersheds move in concert with or towards those in reference watersheds. Aquatic habitats are diverse, with channel characteristics and water quality reflective of the climate, geology, and natural vegetation of the area. Stream habitat features across the Forest, such as large woody material, percent pools, residual pool depth, median particle size, and percent fines, are within reference ranges as defined by agency monitoring." In addition, FW-DC-WTR-07 states, "The sediment regime within water bodies is within the natural range of variation. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport," and FW-STD-RMZ-06 addresses temperature: "Vegetation management shall only occur in the inner riparian management zone in order to restore or enhance aquatic and riparian-associated resources."

Exceptions may occur as long as aquatic and riparian-associated resources are maintained. Exceptions shall be limited to (1) non-mechanical treatments such as prescribed fire, sapling thinning, or hand fuel reduction treatments; (2) mechanical fuel reduction treatments in the wildland-urban interface within 300 feet of private property boundaries; or (3) treatments that address human safety hazards (e.g., hazard trees) adjacent to infrastructure or within administrative or developed recreation sites.”

Aquatics—Riparian Management Zones, Wetland Buffer

Comment (letter numbers 44, 108, 186, 187, 234, 304, 2574, 2761, 2855, 2888, 2984, 2985, 3021, 3087, 3271)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Various commenters expressed support for the increase in buffer sizes. For example, one commenter noted that maintaining large areas of undisturbed habitat adjacent to water bodies would support terrestrial habitat for amphibians and other wetland-dependent species and would also function to provide essential habitat for species of management concern. The promotion of large old-growth trees, especially red cedar and cottonwood, within the riparian management zones would help to maintain potential fisher habitat should efforts be made to reestablish fisher populations, as well as the habitat of other species associated with old growth. Limiting trail development in riparian management zones might reduce human-grizzly bear conflicts because grizzly bears select and frequent these habitat types.

2. The Forest should incorporate both the current (1986) forest plan’s riparian management objectives and the proposed plan’s 300-foot wetland buffers and 100-foot intermittent stream buffers.

3. Including riparian management zones with specific buffer widths and direction in the forest plan as standards makes no sense because the forest plan will have to be modified to respond to better methods of implementing projects or changes in policy direction.

4. Establishing standards for the riparian management zone (formerly called riparian habitat conservation area) and thereby ensuring adherence to these protective buffers is beneficial. However, because the draft plan proposes to create “inner” and “outer” riparian management zones, with more active management allowed in outer riparian management zones, this could result in a net reduction in protection from the previous riparian habitat conservation area widths. For instance, while the width for the old riparian habitat conservation areas and new riparian management zones is the same—300 feet for fish-bearing streams—under the draft plan it might possible that activities could occur in the outer riparian management zone (150-300 feet) that otherwise would not have been allowed in a riparian habitat conservation area.

Apply silvicultural practices for riparian habitat conservation areas to achieve desired vegetation characteristics where needed in order to attain riparian management objectives. Apply silvicultural practices in a manner that does not retard the attainment of riparian management objectives and that avoids adverse effects on inland native fish.

Response

1. Thank you for your support. The Forest agrees that riparian areas are important and thus has continued to provide riparian management zones for inland fish, habitat for amphibians and other

riparian habitat associates, wildlife security, and habitat connectivity and to support stream functions and processes. The Forest would like to reiterate that riparian habitat conservation areas, which are now called riparian management zones, were never intended to be hands-off “buffers” where no management was allowed to occur. As an example, silvicultural practices for riparian management zones to achieve riparian management objectives have been allowed ever since INFISH was published in 1995, so long as the methods did not retard the attainment of riparian management objectives and avoided adverse effects on inland native fish (USDA, 1995b, p. E-7).

2. Since INFISH was adopted on the Flathead National Forest, the Forest has found that four of the six interim riparian management objectives categories listed in INFISH are applicable to the Flathead; these are the ones that apply to forested systems. These four riparian management objectives are pool frequency, water temperature, large woody debris, and width/depth ratio. Temperature data has been included in the NorWEST temperature database (Daniel J. Isaak et al., 2015) that helped to identify the conservation watershed network for the forest plan.

A Columbia Basin-wide monitoring effort known as PIBO systematically collects data that is mostly comparable to the data collected for the large wood and pool riparian management objectives across the USDA Forest Service Northern, Intermountain, and Pacific Northwest Regions. In addition, the PIBO monitoring effort also collects sediment data, which was not included in the INFISH riparian management objectives.

After over a decade of consistently collected data and improvements in data analysis, PIBO data can now be used to compare managed and reference watersheds on the scale of individual national forests. PIBO monitoring best meets the original intent of INFISH riparian management objectives by providing rigorously collected local data that can be statistically compared to reference conditions in the same geophysical province.

The forest plan includes monitoring of aquatic habitat and desired conditions using two of the original riparian management objectives indicators contained in INFISH along with two added sediment indicators. The indicator monitoring is completed by a PIBO interagency monitoring group whose methods have been consistently adjusted to consider scientific advancements. Applicable riparian management objectives contained in INFISH have been retained and moved to the monitoring components when they apply to the Forest landscape to more accurately describe trends at the scale of the forest plan. See section 3.2 in the final EIS on riparian management objectives and monitoring.

3. The riparian management zone widths are defined by standard FW-STD-RMZ-01, and they provide for guidance for project implementation. The Forest anticipates that mapped riparian management zones will be verified at the project level based upon the criteria listed in the standard. Riparian management zones do allow for management within the zones without requiring a plan amendment. There may be reasons to enter riparian management zones, such as to reestablish hardwoods or other desired species and stand structures. Standard FW-STD-RMZ-06 says that vegetation management shall only occur in the inner riparian management zone to restore or enhance aquatic and riparian-associated resources (with some exceptions), and FW-GDL-RMZ-12 says that vegetation management activities within categories 1, 2, and 3 riparian management zones should be designed to include one or more of the following measures to avoid ground disturbance that may deliver sediment to streams or wetlands:

- No ground-based logging equipment unless occurring during suitable winter logging periods;

- Full suspension yarding;
- Falling and yarding methods that promote retention of understory vegetation and other groundcover

These and other standards and guidelines throughout the plan (such as in the Soils and Terrestrial Vegetation sections) provide direction that will allow the Forest to implement projects to meet management objectives while protecting the important roles and functions of riparian areas.

4. Under INFISH, standard and guideline TM-1(b) allowed silvicultural practices for riparian habitat conservation areas to acquire desired vegetation characteristics where needed to meet riparian management objectives. The concept of having greater protection for the inner riparian management zone than the outer riparian management zone is derived from the latest science that has emerged since INFISH was adopted in 1995 indicating that management activities that occur beyond about 100 feet from the stream will maintain stream function and processes. Refer to section 3.2.6 of the final EIS for a discussion of the science associated with the development of riparian management zones.

Aquatics—Sedimentation

Comment (letter numbers 51, 290, 324, 2765)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. It is not reasonable to use sediment as a basis for closing motorized recreational opportunities, even though the impacts from “let it burn” and other management policies are a million times greater and are considered acceptable. A sense of magnitude must be used when making decisions about road closures based on indicators such as sediment production.
2. The Forest has violated NEPA’s “hard look” requirement by failing to disclose the amount of sedimentation that would result from more road miles and increased road use during and after project implementation. Cumulative effects on water quality and wild trout were not adequately analyzed. In addition, there is no provision for reducing road densities in the forest plan, and this should be addressed.
3. Meeting the TMDLs for sediment should be a standard rather than a guideline.

Response

1. Sediment from roads is one of several factors considered when making a decision on the status of a road segment and its availability for use. Road design, maintenance funding, public interest, and security for grizzly bears and elk are examples of other factors that are considered. Roads are closed to protect a variety of resource values when effects are determined to be substantial enough to warrant closing.
2. The forest plan is programmatic in nature and does not make any decisions regarding which roads to close; those decisions are made after site-specific NEPA analysis. Analysis of sedimentation and cumulative effects is also site specific and, therefore, most appropriately addressed at the project level. Objective FW-OBJ-IFS-01 is to decommission or place into intermittent stored service 30-60 miles of road, and objective FW-OBJ-IFS-03 is to maintain 1,000 miles of road, both of which will address sediment concerns.

3. FW-GDL-WTR-01 is a guideline to design projects in TMDL watersheds to comply with the Montana Department of Environmental Quality's TMDL implementation plan. It is the Forest's intent to delist waterbodies, and the Forest has a good track record of doing this, but delisting some waterbodies may be beyond the Forest's control. This is currently the case with Coal Creek, where beneficial uses such as fisheries are being impacted by factors related more to the interaction between bull trout and lake trout in Flathead Lake than to the habitat conditions in Coal Creek (based upon McNeil core sample data).

Aquatics—Threatened and Endangered Fish (Bull Trout)

Comment (letter numbers 46, 108, 201, 290, 2869, 2888, 2904, 2940, 2984, 2996, 3009, 3051, 3097)

Note: The Forest received many comments related to bull trout. Responses under this area of concern are located immediately after each specific comment.

1. Bull trout should be considered an outstandingly remarkable value for wild and scenic river eligibility. **Response:** Bull trout were considered when streams were assessed for outstandingly remarkable values for wild and scenic river eligibility. Not every bull trout stream was determined to warrant outstandingly remarkable value status, but those with the most robust populations were included. The eligibility determination process is described in appendix 5 of the final EIS.

2. The Forest should acknowledge the critical connection to Canada (British Columbia) for wildlife connectivity, both for aquatic and terrestrial organisms. The majority of the genetically pure populations of bull and cutthroat trout breed in Canadian headwaters. Terrestrial connectivity allowed wolves to naturally recolonize the U.S. North Fork. Recognition of the North Fork geographic area as part of the existing international wildlife corridor is important. The Forest should include the following plan component: "The [North Fork geographic area] provides essential terrestrial and aquatic connectivity for fish and wildlife species across the international frontier as part of an acknowledged international wildlife corridor." **Response:** A statement similar to the recommended language has been added to the section on the North Fork geographic area.

3. The draft EIS does not incorporate the 2015 USFWS biological opinion Effects to Bull Trout and Bull Trout Critical Habitat from Road Management Activities on National Forest System and Bureau of Land Management Lands in Western Montana. The forest plan must implement this biological opinion. **Response:** This biological opinion on road management (USFWS, 2015a) still applies, and the Forest will continue to use this programmatic biological opinion for certain projects. Other projects may be addressed through site-specific consultation.

4. There is no consistency between the forest plan and the USDA Forest Service Northern Region's conservation strategy. The Conservation Strategy for Bull Trout on USFS Lands in Western Montana (USDA-USFWS, 2013) determined that the baseline condition in these watersheds was not in good condition. All of the core areas (with the exception of the Hungry Horse Reservoir core area) have at least 50 percent of the core area rated as functioning at unacceptable risk. Although areas as large as an entire 6th level hydrologic unit code do provide high-quality habitat, the overall indication of the conditions is that bull trout are clearly threatened by habitat limitations across most of their range in western Montana. **Response:** The baselines for the USDA Forest Service's Conservation Strategy for Bull Trout on USFS Lands in Western Montana have been updated by the USDA Forest Service Northern Region office and

can be found in Van Eimeren and Gardner ((2017). Considering road locations and how the strategy is modeled, conditions are degraded in some subwatersheds compared to pre-European settlement. For that reason, the Forest has identified a conservation watershed network where bull trout habitat conditions are deemed important, based on expected stream temperature and connectivity to other local populations. Objectives have been identified to improve road and watershed interactions over the life of the forest plan.

5. The forest plan prioritizes “stormproofing” some roads, but this term is not defined and there is no analysis in the draft EIS of whether stormproofing or decommissioning would provide the most benefit to native fish. **Response:** Stormproofing is now defined in the final EIS glossary as follows: “A stormproofed road is one where measures have been taken to upgrade the road so as to minimize the risk and potential magnitude of future erosion and sediment delivery. It generally consists of reducing hydrologic connectivity; identifying and treating potential road failures (mostly fill slope failures) that could fail and deliver sediment to streams; and reducing the risk of stream crossing failures and stream diversion.” Stormproofing and decommissioning will both be used as tools to benefit native fish; it is not an either/or approach because some roads will remain open for public access and management.

6. The primary constituent elements for bull trout were not analyzed. Neither the draft forest plan nor the draft EIS analyzes how the alternatives will impact the primary constituent elements for bull trout (that would also benefit other native fish). **Response:** The primary constituent elements for bull trout “critical habitat” are analyzed in section 3.2.4 in the final EIS, subsection “Bull trout,” in the Forest’s biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017), and in the USFWS biological opinion (USFWS, 2017b).

7. The forest plan does not include habitat standards to meet the primary constituent elements. **Response:** INFISH also did not contain habitat standards. Instead, it had riparian management objectives to use in comparing stream reach conditions in a project area to the reference conditions measured in streams across the western United States. See the response to comment 6 above.

The Forest’s biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) contains a cross-reference of the primary constituent elements and the framework for consultation, which has habitat indicators. These indicators, such as temperature, bank stability, large wood, etc., are provided for by many of the desired conditions, standards, and guidelines throughout the water, riparian, and infrastructure sections in the forest plan. For example, FW-STD-RMZ-06 is designed to protect stream habitat and provide for these indicators by restricting vegetation management within the inner riparian management zone, with a few exceptions such as nonmechanical treatments or fuel reduction within 300 feet of private property boundaries.

8. The draft EIS fails to analyze an alternative that includes standards and guidelines that actually conserve and recover native fish, improve water quality so watersheds are no longer impaired on the 303(d) list, or reduce road densities so they are not degrading water quality and fish habitat. **Response:** Objective FW-OBJ-IFS-01 is designed to reduce roads on the Forest. Various plan components are focused on improving native fish habitat and water quality in specific conservation watersheds. Standards and guidelines are provided throughout the plan, such as in the sections on watersheds, riparian management zones, and infrastructure, to conserve native fish and improve water quality.

9. The draft forest plan does not identify those road culverts that are confirmed to be partial or total barriers to westslope cutthroat trout during some part of the year. It is equally important to

identify those culverts that are undersized as a focus for management intervention, particularly because the negative impacts of undersized culverts on native salmonid populations are expected to increase as climate change accelerates. **Response:** Objective FW-OBJ-CWN-01 is designed to stormproof roads to reduce potential culvert failure of undersized culverts. In addition, roads are reviewed and inventoried at the project level, and project-level decisions will determine which actions are needed to provide passage for fish or reduce sediment.

10. Because native fish are migratory, it is crucial to protect all of these waterbodies in order to conserve and recover bull trout and westslope cutthroat trout. **Response:** All watersheds that have been designated as critical habitat by the USWS are part of the conservation watershed network, as well as all westslope cutthroat trout watersheds in the South Fork of the Flathead drainage. These watersheds are part of the conservation watershed network to conserve native fish that have been identified through modeling by Isaak et al. (2016) to provide cold water into the future, and thus they serve as refugia.

11. Many of the factors that have led to a decline of native fish will persist, and thus these threats will continue under the current revision proposals. **Response:** PIBO monitoring has shown that habitat conditions have improved in many streams across the Forest. The number of 303(d) impaired streams, as reported by the Montana Department of Environmental Quality, has decreased. Much of this improvement is likely due to the riparian standards and guidelines from INFISH. Similar standards and guidelines and riparian widths are included in the forest plan, and this will provide for the protection of stream and riparian function.

12. Without riparian management objectives, the plan components no longer provide the ecological conditions necessary to contribute to the recovery of bull trout or maintain a viable population. **Response:** See response to comment 6 above. Also, the Forest will work cooperatively with MFWP and other agencies to address the impact that non-native fish such as lake trout have on native fish, which will contribute to the recovery of bull trout.

13. The priority watersheds under the watershed condition framework will not provide additional protection for bull trout. Despite the fact that the draft forest plan has identified these priority watersheds, it provides no further protections for bull trout in those watersheds. The draft plan provides no heightened standards or objectives for category 2 “functioning at risk” watersheds and at best provides a few objectives that give these watersheds an unquantified “prioritization” in their general management guidelines. Even under the weak INFISH, there were additional standards designed to protect bull trout in priority watersheds. **Response:** The 2012 planning rule requires priority watershed delineation. This represents tactical direction to focus active restoration on some of the most important watersheds on the Forest during the life of the plan. Identified priority watersheds may be bull trout watersheds, but they do not need to be, as allowed by the 2012 planning rule. The forest plan has another plan component topic, the conservation watershed network, that does provide additional protection for bull trout by limiting road development in riparian areas and prioritizing aquatic restoration activity such as stormproofing.

14. Regardless of which type of analysis it uses, the Forest Service should consider certain core areas important for bull trout recovery. Much of the Flathead National Forest falls within the Columbia headwaters recovery unit for bull trout. See figure D-1 in the Columbia Headwaters Recovery Unit Implementation Plan for Bull Trout (USFWS, 2015b), which is a map of the Columbia headwaters recovery unit for bull trout. This recovery unit includes 35 bull trout core areas, only one of which is considered at low risk. To address habitat threats in the Flathead Lake core area, the USFWS recommends continuing “to strengthen connectivity and consolidate habitat gains in headwater SR [spawning and rearing] tributaries while seeking to secure sources

of cold water in the SR tributaries” as a way to address climate change and water quality issues.

Response: The Forest has identified a conservation watershed network that is closely aligned with the USFWS recovery recommendations for bull trout in the Columbia headwaters recovery unit.

15. The draft forest plan does not provide measures for bull trout protection. The Forest must revisit the draft plan and provide measurable, science-based, mandatory management imperatives in order to make any real progress towards ensuring the survival and recovery of bull trout. Furthermore, the Forest must engage in consultation with USFWS under section 7 of the Endangered Species Act in order to ensure that its actions do not jeopardize the continued existence of bull trout and do not adversely modify bull trout critical habitat. **Response:** The Forest consulted with the USFWS. See the Forest’s biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) and the USFWS biological opinion (USFWS, 2017b).

16. It is not clear how either the Bull Trout Recovery Plan or the Bull Trout Conservation Strategy have been incorporated. The final EIS should include a cross-reference between these and the plan components. Any differences should be acknowledged in the environmental effects analysis. **Response:** The bull trout conservation strategy completed for national forests in western Montana in 2013 (USDA-USFWS, 2013) describes the actions needed to advance the recovery of bull trout on national forest lands. The forest plan considered this strategy and identifies a conservation watershed network that limits road development in riparian management zones. Objectives for restoration in the associated conservation watersheds, primarily stormproofing, have also been identified.

Although the Flathead National Forest is included in the Columbia Headwaters Recovery Unit Implementation Plan (USFWS, 2015b), the highest priority actions identified by the USFWS address non-native fish in the Flathead River system, especially lake trout. The recovery unit implementation plan calls for passive restoration and continuing “to strengthen connectivity and consolidate habitat gains . . . to secure sources of cold water.” Although no primary habitat threats are listed on the Flathead National Forest, the Flathead’s forest plan will continue to improve portions of the road system through stormproofing to lessen the effects of sediment on bull trout, westslope cutthroat trout, and water quality.

17. The Forest should continue to implement the riparian management recommendations, standards and guidelines, and riparian habitat conservation areas that are in the Inland Native Fish Strategy and the PACFISH/INFISH biological opinion, with the following additions and changes based on various studies. Fine sediments < 6.4 millimeters in diameter must be limited to less than 20 percent in spawning habitat, and standards must be developed to maintain groundwater. All streams should average 90 percent bank stability, and cobble embeddedness should be < 30 percent in summer rearing habitat and < 25 percent in winter rearing habitat. Additional indices related to channel morphology include large woody debris, pool frequency, volume, and residual pool volumes. Stream temperatures in current and historic spawning, rearing, and migratory corridor habitats should not exceed 6-8 °C for spawning, with the optimum for incubation from 2-4 °C; for rearing habitat from 10-12 °C, with 7-8 °C being optimal; and for migratory stream corridors, 12 °C or less. Establish a total and open road density standard that protects and restores native fish habitat by reducing sediment, restoring hydrologic upwelling, and eliminating barriers. **Response:** The riparian management objectives from INFISH have not been carried forward in the same context that they originally had in the PACFISH and INFISH strategies. Instead, those riparian management objectives most likely to respond to management have been moved to the monitoring section of the forest plan and will be used to track trends across the Forest. A road

density standard has not been proposed because within the primary conservation area for grizzly bears, the 2011 baseline road level will be frozen, so there will be no net increase in roads. Also, see the discussion on the best available scientific information related to riparian management objectives contained in section 1.4.3 of the final EIS. Several plan components are designed to protect groundwater and source water protection areas: FW-DC-WTR-06 and 10 and FW-STD-WTR-02 and 03.

18. Critical habitat is not currently being provided for. Critical habitat requires additional protections beyond those contained in INFISH. For example, upland influences must specifically be considered. Thus, the area of protection around critical habitat is a much more elastic concept than INFISH, which relies on simple linear distance measurements. **Response:** The forest plan does consider impacts from outside the stream and riparian management zones that may influence critical habitat, such as sediment from roads. The biological assessment (Kuennen, Van Eimeren, Trechsel, & Shelly, 2017) contains a cross-reference of the primary constituent elements and the framework for consultation, which has habitat indicators. These indicators, such as temperature, bank stability, and large wood, are provided for by many of the desired conditions, standards, and guidelines throughout the water, riparian, and infrastructure sections of the plan. Appendix G in the plan provides a cross-reference of plan components that are pertinent to bull trout and other aquatic species.

19. The Forest should monitor bull trout. Even if bull trout critical habitat designation were removed and the bull trout were delisted, the Forest Service would still be required to protect and monitor bull trout as a “species of special concern.” **Response:** As funding allows, the Forest will continue to monitor bull trout by counting their nests, known as redds, in spawning reaches in cooperation with MFWP. Habitat conditions important to bull trout will be monitored by PIBO monitoring.

20. The Forest should consider the impacts of climate change. The Forest Service has an obligation to display the potential impacts of climate change on bull trout distribution and survival. Thermal barriers are a known obstruction to bull trout movements and have the capability to fragment and isolate populations, limiting or eliminating the migratory form of bull trout and increasing the threats from genetic isolation and the ability to re-establish after extreme landscape events. Bull trout become fragmented into low populations lacking minimum viable population size (B. E. Rieman & Allendorf, 2001). Rising watershed air temperatures are cited by Rieman et al. (2007) as a prominent threat to bull trout survival. **Response:** The Forest considered climate change using state-of-the-art stream temperature monitoring (Daniel J. Isaak et al., 2015), and this informed the Forest’s selection of subwatersheds included in the conservation watershed network for cold-water refugia. The effects of climate change on fish are discussed in the final EIS (see appendix E).

Aquatics—Water Quality

Comment (letter numbers 2765, 2836, 2855, 2901, 3094, 3283)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Coal Creek, Goat Creek, and Jim Creek contain bull trout and are in need of restoration. Recovery areas are not meeting state water quality standards or are failing to meet beneficial uses due to identified, and preventable, human causes. The Forest Service uses Big Creek as an example of a restoration success (draft EIS, p. 52). But Coal Creek, which is an occupied bull

trout tributary in the North Fork of the Flathead River, is on Montana's 303(d) list of impaired waterbodies. How long will it take for Swan Lake, Flathead Lake, Whitefish Lake, and the Stillwater River meet state water quality standards, as well as Jim Creek, Goat Creek, and Logan Creek? No projections are made, and no additional funding can be guaranteed to replicate the watershed-scale restoration effort comparable to Big Creek. If restoration is a priority, then there should be dedicated funding and a scheduled date for the expected cleanup and removal from the 303(d) list of these listed waterbodies.

2. Water quality should be protected, and one means is by the proposal to manage recommended wilderness areas to preserve their wilderness values, including excellent water quality that is vital for the future of the watershed. The quality and quantity of water resources must be protected by wise watershed management. Keep water sources clean for native fish.

3. Alternative C provides the greatest amount of protection for maintaining watershed and fisheries health. This is largely driven by the increased amount of recommended wilderness compared to the other alternatives. As noted in the draft EIS, "The overall effect of recommended wilderness areas, especially in Alternative C, is expected to be beneficial to water quality and quantity" (vol. 1, p. 83). Alternative C provides the best protection for water quality and aquatic system function (draft EIS, pp. 81-83, 99, 101).

4. The PIBO data referred to in the draft EIS and appendix E are mainly based on surface fine measures. Cobble embeddedness is a better measure for stream health.

5. The focus on understanding the cumulative effects of forest management programs on water quality downstream to Flathead Lake, as well as within the Forest, is important. Objectives and guidelines for how this will occur are needed.

Response

1. A decision was signed for the Chilly James Restoration Project in 2016 requiring the improvement of habitat conditions in Cold and Jim Creeks. The Forest has worked cooperatively with MFWP to restore conditions in Coal Creek by adding large wood. Beneficial uses were determined by Montana Department of Environmental Quality as not being fully met due to low numbers of bull trout redds, which is most likely due to impacts from lake trout in Flathead Lake since McNeil core samples show that sediment levels have improved since the mid-1990s. It is difficult to predict when streams will be delisted as this is highly dependent upon funding, but under the watershed condition framework, priority watersheds (which these are) will receive the highest priority.

2. Plan components for water quality are addressed throughout the plan components and more specifically under FW-DC-WTR-06.

3. Thank you for your support for alternative C. The Forest will consider your input in the decisionmaking process.

4. The Forest uses several metrics to determine stream health with regard to sediment, and all have strengths and weakness. The metrics are D50, percent surface fines, McNeil core samples, substrate scores, and embeddedness.

5. One of the Forest's main concerns is sediment, and there are numerous plan components in the water, riparian, soils, and infrastructure sections of the forest plan that are designed to minimize sediment delivery to streams and thus reduce the cumulative impacts on Flathead Lake.

Monitoring item MON-WTR-6 requires the monitoring of water quality to determine whether nutrients are being delivered to Flathead Lake.

Aquatics—Watersheds

Comment (letter numbers 55, 233, 2875, 2879, 3009, 3037, 3131, 3271)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Important wetlands identified by the Montana Natural Heritage Program are not protected.
2. Stream connectivity may not be sufficient because in the Flathead National Forest's draft forest plan, the extent to which the proposed 10-20 miles of reconnected streams would address the problem of stream network fragmentation across the Forest was unclear; would this level of effort solve the problem, or would it be largely inconsequential?
3. The Forest should secure additional nonmotorized and roadless areas that will aid in landscape restoration goals well into the future, such as the Beaver Creek road decommissioning and restoration.
4. Added stream protection is of course critical to this entire effort. The upper 2 miles and lower 11 miles of Swan River and the Lion Creek (11 miles), Elk Creek (10 miles), and Glacier Creek (6 miles) stream segments proposed in alternative C need to be attended to. The Crown of the Continent provides the precious resource of water to the entire northwest part of the country. Protecting our watersheds should be a high priority—once we've ruined our waterways, it's difficult and expensive to fix them. The Forest should adopt alternative C because it provides maximum watershed protection, which is essential for a clean and healthy environment, particularly the protection of the headwater tributaries to all three forks of the Flathead River system.

Response

1. All wetlands and fens greater than 0.5 acre will have a 300-foot riparian management zone, and wetlands less than 0.5 acre will have a 50-foot riparian management zone; these are designed to protect riparian processes and functions. Certain standards and guidelines apply that limit activities within riparian management zones for both wetlands and streams. Riparian management zone maps are based upon the best available scientific information and will be further refined based upon field conditions as site-specific projects are implemented.
2. Great strides have been made over the last two decades in providing connectivity for native fish by removing or replacing culverts on the Forest. For example, there are no culverts blocking adult bull trout from accessing their spawning streams or reaches. The Forest is using the conservation watershed network to prioritize where road work will occur to benefit native fish.
3. The inventoried roadless areas are not altered by the forest plan and will continue to provide cold, clean water downstream to important fishery areas. Restoration by reducing roads is identified in plan objectives and will occur in certain areas that will benefit multiple species such as grizzly bears and bull trout.
4. Rivers and streams that are determined to be eligible will have protections in place to ensure that their outstandingly remarkable values will be protected until the rivers are designated wild

and scenic by Congress. These protections generally limit activities but do not necessarily restrict all activities within 0.25 mile of the banks. Water and watersheds are keystones of the management of the Forest, and the Forest has designed numerous plan components throughout the plan to protect them and the biota within them.

Availability of Information

Comment (letter numbers 51, 3068, 3079)

The Forest did not provide specialist reports and some data was not up to date.

Response

The resource specialists on the planning team did not write separate specialist reports but rather authored the EIS and the forest plan, following the requirements for those documents and the 2012 planning. In some cases, additional supporting information and analyses are provided as exhibits in the planning record. The most current data was used for the draft EIS, and it has been updated as appropriate in the final EIS.

Backcountry

Comment (letter numbers 258, 2798, 2865, 2917, 3035, 3116)

The Forest should not expand the backcountry areas (recommended wilderness) because more backcountry would further restrict management on the Forest and would impede search and rescue efforts. Areas allowing motorized use and snowmobiling should be expanded.

The Forest should expand the backcountry designation (management area 5a) to allow mechanized users to experience the backcountry without the disruption caused by motorized users.

Response

Alternative B modified allocates 316,770 acres to backcountry management (management areas 5a-5d). The decisionmaker carefully considered a range of recommended wilderness areas as well as other allocations to determine the mix of land and resource uses that would best meet public needs. The areas recommended in this decision are an appropriate land use designation for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments. Search and rescue is allowed in designated and recommended wilderness as well as in backcountry management areas.

Alternative B modified decreases opportunities under the draft forest plan for backcountry nonmotorized and mechanized use by 6,576 acres to 149,528 acres (management area 5a). The decisionmaker carefully considered a range of backcountry areas as well as other allocations to determine the mix of land and resource uses that would best meet public needs. Alternative B modified increases recommended wilderness under alternative B in the draft EIS by 2,662 acres.

Best Available Scientific Information

Best Available Scientific information—Amendment 19

Comment (letter numbers 73, 162, 332, 2888, 3021)

The draft EIS section on grizzly bears needs to be improved to better address best available science on amendment 19 and the effects of motorized road use as well as motorized and nonmotorized trail use.

The 20 years of monitoring the implementation of amendment 19 indicate that it may take more than a decade to adequately revegetate a reclaimed road so it no longer functions as a road or trail, and this requires that the security core remain in place longer than the amendment 19 minimum of 10 years. NEPA and the planning rule require that this be addressed through planning that is consistent with the results of monitoring and the best available science.

The forest plan is abandoning the best available science, which is the 1990 Interagency Grizzly Bear Committee meeting summaries and the 1995 Flathead land and resource management plan amendment 19. The Forest should identify which information it considers the best available science to explain the basis for determinations and explain how that information is applied to the issues being considered.

Statements in the draft EIS regarding the effects of nonmotorized use of trails on grizzly bears are not correct, and adjusting this component of amendment 19 is not based upon best available science. By comparing the maps in figures 1-37 through 1-42, it appears that grizzly bear security core is greatly increased in alternative B in such areas as the Jewel Basin Hiking Area and the Bob Marshall Wilderness, when it is actually the result of no longer buffering grizzly bear security core within 500 meters of high-use nonmotorized trails.

The draft EIS used old-school methods of calculating road densities as the best available science (Boulanger & Stenhouse, 2014) in the Salish and other demographic connectivity areas rather than the more precise “moving window” GIS methods adopted by amendment 19 and the Interagency Grizzly Bear Committee.

Response

Section 3.7.5 of the final EIS, on the grizzly bear and the consequences of alternative A, discloses the effects of continued implementation of amendment 19. The final EIS has been refined and clarified with additional discussion of amendment 19 and what appendix TT says about reclaimed roads and security core remaining in place for 10 years. The 10-year time period used in appendix TT is not based upon the time it takes to revegetate a road; it is based upon the approximate time it takes for a female grizzly bear to reach reproductive age and raise a generation of offspring (also see comments and responses under Grizzly Bear—Road Density and Security Core Habitat, Best Available Scientific Information—Grizzly Bear, and Grizzly Bear—Support for Amendment 19 Standards).

Section 219.3 of the 2012 planning rule requires that the responsible official use the best available scientific information to determine what is most accurate, reliable, and relevant. For the best available scientific information, the Forest used available peer-reviewed articles and data for which accurate and reliable statistical or other scientific methods have been used to establish the accuracy or uncertainty of any findings (Forest Service Handbook 1909.12 chap. Zero Code sec. 07.12), if available. For relevancy, the Forest used local data or studies and studies that occurred in the western United States in habitat conditions similar to those that occur in the Flathead National Forest, if available. If these were not available, articles that considered ecological processes or conditions relevant to the plan area were selected. The Forest attempted to avoid relying on professional opinion when studies from peer-reviewed journals were available. However, in accordance with section 07.13 of the 2012 planning rule directives (Sources of

Scientific Information), scientific information that may be considered best available scientific information includes expert opinion, panel consensus, inventories, or observational data prepared and managed by the Forest Service, other Federal agencies, universities, national research networks, other reputable scientific organizations, and data from public and governmental participation. This information may include monitoring results, information in spatially referenced databases, data about the lands and resources of the planning unit, and various types of statistical or observational data. The reference sections in the final EIS include the best available scientific information and also opposing scientific information, in conformance with NEPA.

For the grizzly bear, one of the best sources of information is the response of the NCDE grizzly bear population to existing conditions and trends in the NCDE. Extensive monitoring of the NCDE grizzly bear population indicates that the current population size substantially exceeds the goal stated in the Grizzly Bear Recovery Plan (USFWS, 1993) and that the population is expanding in distribution (Costello et al., 2016; Mace et al., 2012), even though the Forest does not meet the 19-19-68 percentages of amendment 19 in every grizzly bear management subunit.

Amendment 19, enacted in 1995, was based upon the best available scientific information at the time, which was a study of habitat use by grizzly bears in the Swan Mountains. Today there is a much more extensive body of knowledge about the grizzly bear population in the NCDE. Existing conditions for the grizzly bear population and its habitat security on the Flathead National Forest are discussed in section 3.7.5 of the final EIS, subsection “Affected environment.” The analysis of effects on the NCDE grizzly bear population is discussed in the two biological assessments and biological opinions related to the forest plan and amendments (Kuennen, Van Eimeren, & Trechsel, 2017; USFWS, 2017a, 2017b; Warren et al., 2017) and in the final EIS.

The Forest used the moving window analysis method for analysis in the recovery zone/primary conservation area because this allowed a comparison of conditions in bear management subunits by alternative and because the draft Grizzly Bear Conservation Strategy recommended this method for use in determining the baseline for the recovery zone/primary conservation area. Section 3.7.5, subsection “Affected environment,” of the draft EIS explains how the methods used to assess the effects of human uses on grizzly bears and their habitat security have evolved over the years. The final EIS explains that amendment 19 was based upon Interagency Grizzly Bear Committee recommendations, revised in 1998 (IGBC, 1998) and explains how this information is applied to the issues and alternatives being considered.

Mace and others published their results in 1996 and stated that most grizzly bears did not avoid and even selected for areas within 0.5 kilometer of closed roads or roads receiving use by less than 10 vehicles per day but avoided areas within 0.5 kilometer of roads receiving use by more than 10 vehicles per day. Few bears exhibited selection towards habitat near roads receiving use by more than 60 vehicles per day. The authors stated that spatial avoidance and grizzly bear mortality would increase as traffic levels, road densities, and human settlement increased. The published results of Mace and others, and subsequent discussions of effects of roads on grizzly bears, was based upon telemetry data from 18 total grizzly bears, including 13 or 14 adult female grizzly bears, that were located twice each week with fixed-wing aircraft. As stated by Mace and others (1996):

We maintain that road density standards and road closure programs should incorporate seasonal habitat requirements of grizzly bears. A properly implemented program would minimize road density and traffic volume in watersheds having highly preferred habitats such as those with avalanche chutes during spring. Based on local knowledge of grizzly

bear habitat selection patterns, road density standards could be relaxed in somewhat less suitable habitats, allowing increased public use while minimizing threats to the local grizzly bear population. . . . Road closure programs in the NCDE are extremely controversial because traditional access by vehicle for recreation and resource extraction is reduced. An important balance must be met between grizzly bear security and survival, and human sociological and economic concerns. (p. 1403)

Regarding the supporting rationale for adjusting components originally contained in amendment 19, such as deducting an influence zone for nonmotorized trails from grizzly bear security core, the discussion has been refined and clarified in the two biological assessments (Kuennen, Van Eimeren, Trechsel, et al., 2017; Warren et al., 2017) and the final EIS (sections 3.7.5 and 6.5.5). Where warranted, the final EIS provides additional discussion of effects and new literature citations. Information on uncertainty or opposing scientific viewpoints is included for the responsible official to consider when making a decision.

With respect to the comment on the draft EIS, figures 1-37 through 1-42, the Forest added additional explanation of the differences in the maps in section 3.7.5 of the final EIS. A figure showing NCDE trails that are considered to be high use can also be found in the biological assessments (Kuennen, Van Eimeren, Trechsel, et al., 2017; Warren et al., 2017). See also the comments and responses under Grizzly Bear—Impacts of Motorized and Nonmotorized Recreation.

In response to public comments, the analysis and discussion of open road and route densities in relation to the objectives for grizzly bears in zone 1, the demographic connectivity areas, and zone 2 have been refined and clarified in the final EIS. The recent findings of Boulanger and Stenhouse (2014) were used to assess the effects of the alternatives outside of the NCDE recovery zone/primary conservation area for several reasons. In these zones, bear management subunits for grizzly bear habitat have not been delineated. Furthermore, portions of grizzly bear management zones 1 and 2 are dominated by private lands. Prior to conducting its analysis on the effects of roads and trails on grizzly bears outside the recovery zone/primary conservation area, the Forest Service discussed its analysis methods with the grizzly bear recovery coordinator. He stated that Boulanger and Stenhouse (2014) provides the best available scientific information on the effects of open roads on grizzly bears of various sex and age classes in environments such as those found in portions of NCDE zones 1 and 2. As stated in the EIS, Boulanger and Stenhouse published their findings in a peer-reviewed publication and based their conclusions on telemetry data from 142 grizzly bears in Alberta. These grizzly bears live in an area of the northern Rocky Mountains that has industrial uses such as timber harvest and mining, similar to portions of the NCDE in zones 1 and 2. Their study used very accurate data from global positioning system (GPS) radio collars that were programmed to acquire a location every 1-4 hours. In addition, very high frequency (VHF) ear tag transmitters (ATS) were fitted on all captured bears. This information enabled the authors to relate road densities to occupancy by and mortality of the marked bears.

In summary, the final EIS acknowledges that human uses can have detrimental effects on grizzly bears but explains that scientific methods for analysis of effects have changed from the 1990s to the present. The draft EIS and the final EIS explain the rationale for the Forest's choice of methods and provide quantitative as well as qualitative information to support its conclusions as to how the alternatives could be expected to affect individual grizzly bears and the NCDE grizzly bear population as a whole. In addition to models of road density, the best available scientific information includes extensive monitoring of the NCDE grizzly bear population over the last few decades. Habitat conditions and management actions on the national forests have contributed to

the increased population size, increased distribution, increased genetic diversity, and improved status of the grizzly bear across the NCDE (Costello et al., 2016; Mickle, Graves, Kovach, Kendall, & Macleod, 2016), even though 19 percent open motorized access density, 19 percent total motorized access density, and 68 percent security core have not been achieved in all bear management subunits.

Best Available Scientific Information—Aquatics

Comment (letter numbers 290, 2765, 2869, 2888, 2940)

Sediment, an important indicator of bull trout habitat according to the best available science, is not included as a standard in spite of the fact that it is measurable and based on local science.

The best management practices do not protect fish habitat and are only applied on a small portion of roads.

The draft EIS offers no scientific justification for delineating inner and outer riparian management zones. The forest plan allows short-term degradation through “management” in riparian areas, which is unacceptable.

The forest plan offers only one scientific study to justify logging in riparian areas, Benda et al. 2015 (which was not included in the literature cited). Allowing logging in riparian areas must be based on the best available science, not one study. In addition, existing early successional openings in riparian areas are in the middle of the natural range of variation, at 24,000 acres, so logging in riparian areas is unnecessary. Include the 2015 work by Benda et al. in the literature cited and present the best available scientific information for riparian harvest.

All of INFISH, published in 1995, is still considered best available science and therefore should not be changed in any way.

The standards and guidelines from INFISH are being weakened. Disclose any and all scientific literature (best available science) that overturns the science used to establish the “terms and conditions” contained in the INFISH biological opinion.

The plan should provide criteria for the kinds of places where active vegetation management within riparian management zones would be desirable to improve aquatic conditions.

Response

Sediment is important to monitor but is not appropriate as a standard. See section 3.2 in the final EIS. Sediment is an important indicator of bull trout habitat, according to best available scientific information, and is rigorously monitored through the PACFISH/INFISH biological opinion monitoring program. Sediment is not included as a standard, nor was it included as a standard under INFISH, due to the dynamic nature of how sediment is produced, routed, and stored in a stream. It is best to look at trends in sediment rather than at a numerical standard. The Forest cooperates with MFWP on long-term sediment monitoring and has McNeil core samples dating back to 1980 on selected bull trout streams. Sediment will continue to be monitored according to best available scientific methods under the forest plan.

The Forest participates with the Montana Department of Natural Resources and Conservation’s monitoring of forest practices for best management practice implementation every two years. In 2014, 42 review sites were evaluated for best management practice application. Results showed

that across all ownerships, best management practices were properly applied 97 percent of the time. Although many harvest sites had at least one instance where a best management practice was inadequately applied, a majority of the departures were minor and did not cause erosion or deliver material to a stream. Of all sites, 5 percent had one or more major best management practice departures in application. In the 2012 reviews, 7 percent had major best management practice departures in application.

The field review teams also evaluated the same 42 sites for best management practice effectiveness. Results showed that, across all ownerships, best management practices were effective in protecting soil and water resources 98 percent of the time. Of the 42 sites, 31 percent had one or more minor departures in best management practice effectiveness. This compares with 48 percent in 2012. Minor departures in effectiveness produce minor impacts to soil and water resources; for example, eroded material reaches a draw but not a stream. Major departures for best management practice effectiveness were found on 7 percent of the sites compared to 12 percent in 2012. High-risk best management practices were effective in providing adequate protection to soil and water resources 94 percent of the time (Ziesak, 2015).

A 2016 report summarizes the effectiveness of best management practices related to NFS roads as follows: “Based on the results of most of these studies, the case can be made that most BMPs [best management practices] result in some level of effectiveness in terms of reduced sediment generation or transport” (Edwards, Wood, & Quinlivan, 2016, p. 136)

The final EIS has additional text citing best available scientific information and describing the purpose of delineating inner and outer riparian reserves.

Benda et al. (2016) has been added to the references. It was incorrectly cited as a 2015 document in the draft EIS. See additional discussions and inclusions of the best available scientific information for riparian areas, aquatics, and the relationship to INFISH in the final EIS under sections 3.2 and 3.2.6, and in Thomas (2017).

Section 219.3 of the 2012 planning rule requires the responsible official to use best available scientific information and to determine what is most accurate, reliable, and relevant. By and large, the aquatic components in the proposed plan were carried forward from INFISH, except when best available scientific information indicated that modification was prudent. Also, some original INFISH components have been edited to be consistent with 2012 planning rule requirements. The most significant group of components that has been edited for consistency are the standards and guidelines. In INFISH, they were not differentiated. In the forest plan, standards and guidelines are separate and have unique definitions, based on the 2012 planning rule direction. The Forest determined which component type would be most effective in guiding the Forest towards achieving a desired condition when developing the plan components for the forest plan.

Regarding the most accurate best available scientific information, the Forest used available peer-reviewed articles and data for which “reliable statistical or other scientific methods have been used to establish the accuracy or uncertainty of any findings” (Forest Service Handbook 1909.12 chap. Zero Code sec. 07.12). When the Forest was aware of a difference of opinion in refereed journals, opposing viewpoints were included for the deciding official to consider when making a decision. For relevancy, the Forest used studies that occurred in the West in habitat conditions similar to those that occur on the Flathead National Forest, if available. When such articles were not available, articles that considered ecological processes relevant to the plan area were selected. The Forest attempted to avoid relying professional opinion when peer-reviewed journals were available. However, in accordance with section 07.13 of the 2012 planning rule directives

(Sources of Scientific Information), scientific information that may be considered best available scientific information includes expert opinion, panel consensus, inventories, or observational data prepared and managed by the Forest Service, other Federal agencies, universities, national research networks, other reputable scientific organizations, and data from public and governmental participation. This information may include monitoring results, information in spatially referenced databases, data about the lands and resources of the planning unit, and various types of statistical or observational data. Regarding the rationale for adjusting components originally contained in INFISH, substantial analysis and literature citations supporting the Forest's approach have been added to the final EIS under section 3.2.

Science is not static, and much has been published on changes in the Forest's understanding of aquatic systems since INFISH was published. Between the draft and final EIS, the Forest has reviewed and disclosed best available scientific information. The Forest contends that by and large it has retained and carried forward most of the components from INFISH. As an example, the Forest has retained such features as the widths of the original riparian habitat conservation areas, which are now called riparian management zones. The Forest has added additional components, such as inner and outer riparian management zones, in order to clarify the needs for management that were implied but not explicitly described in INFISH. As another example, the forest plan retains riparian management objectives but has moved them to monitoring based on the findings of best available scientific information, which are disclosed under section 3.2 in the final EIS.

The draft forest plan contained components that guide the types of activities that are generally appropriate for inner and outer portions of riparian management zones. Exactly where vegetation management within riparian management zones may occur would be determined at the site specific level, taking into account conditions within and outside of the riparian management zones as well as the purpose and need for the proposed project. Additional text that discloses the best available scientific information regarding the need for active management in riparian management zones has been added to the final EIS under section 3.2. Additional examples of strategies to help clarify component implementation, specifically as it relates to where activities would be appropriate in the inner riparian management zone, have been added to the plan in appendix C.

Best Available Scientific Information—General

Comment (letter numbers 188, 2888, 0904, 3002, 3102)

The Forest does not rely on the best available science, did not provide all citations in the literature cited section of the draft EIS, cited draft documents, and did not provide all of the sources to the public. The Forest did not cite in the draft EIS the literature provided in scoping comments .

Response

The Forest reviewed the list of literature provided in the scoping comments (Kuennen, 2014). The literature cited section in the draft EIS did omit some citations; the final EIS corrects these omissions and has complete reference sections for each document. When available, the citations include url addresses and/or doi's (digital object identifiers, which are unique alphanumeric strings used to provide a permanent link to a document's location on the Internet). The planning record contains copies of documents that may be more difficult for the public to obtain, such as unpublished reports.

In some instances, draft documents did need to be referenced. The forest plan, amendments, final EIS, and records of decision reflect the finalized documents if they are available. If new scientific information becomes available in the future, the Forest will evaluate its applicability and adjust management direction if deemed necessary. Resource specialists considered what is most accurate, reliable, and relevant in their use of the best available scientific information. The best available scientific information includes all or portions of the publications listed in the reference sections of the Flathead's draft EIS, as well as any additional information that was used and is included in the reference sections of the final EIS or in the planning record prior to the final record of decision. These documents also include reference to and discussion of opposing or incomplete scientific information, as appropriate under NEPA. Refer to the draft record of decision for additional discussion of the use of best available scientific information.

Best Available Scientific Information—Grizzly Bear

Comment (letter numbers 153, 246, 249, 306, 2888, 2894, 2904, 2940, 2984, 3002, 3160, 3181, 3220)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The best available science on grizzly bear habitat security and motorized access route density is amendment 19. Or, the best available science is the restoration components of the Citizen reVision in the Hungry Horse, South Fork, Middle Fork, Swan Valley, and other areas on the Flathead National Forest. Weakening or eliminating road density standards runs counter to the best available science.
2. The Forest Service should base the forest plan on the final grizzly bear conservation strategy, not the draft document, and should wait for habitat-based recovery criteria. References to a “recovered population” of grizzly bears should be removed.
3. Using 2011 as the baseline year for the NCDE grizzly bear population has no scientific basis.
4. The analysis fails to take a “hard look” at the impacts to grizzly bears from logging and other vegetative management projects and does not rely upon the best available science, thus violating the requirements of NEPA.
5. The Forest Service should recognize the need for a comprehensive strategy for the entire regional metapopulation of grizzly bears, not just the NCDE in isolation.
6. Without long-term, ecosystem-wide grizzly bear habitat research, it is impossible to determine whether the amendments are sufficient to protect important habitat components (including sufficient home ranges and habitat connectivity), key food sources, or genetic health, or to protect grizzly bears against conflict with humans and human-caused mortalities.
7. The best available science indicates that the standard under alternative 3 for the “expanded grizzly bear distribution zone” on the Helena National Forest, which limits open motorized routes to a road density of 2.4 miles/square mile, is too high to support bear use of the area.
8. The Forest Service fails to consider relevant science (Bader, 2016) indicating that the most recent population estimates for the NCDE (Costello et al., 2016) are almost certainly too high; that crucial aspects affecting the grizzly bear have not been assessed; that estimates should not be used as a basis for removing Endangered Species Act protections, reinstitution of hunting, or for

land management planning (including Flathead and Lolo National Forest plan revisions and the four national forest amendments).

Response

1. One commenter said the Forest used outdated research but did not specify what research they believe is outdated. The final EIS provides extensive review of and references to peer-reviewed scientific literature that documents the status, habitat relationships and responses to management activities of grizzly bears. As required by NEPA, the Forest reviewed and discusses scientific consensus as well as opposing scientific information. Regarding the comment that the best available scientific information on grizzly bear habitat security and motorized access route density is amendment 19, see Grizzly Bear—Draft EIS Analysis, Best Available Scientific Information—Amendment 19, and Grizzly Bear—Support for Amendment 19 Standards. With respect to the Citizen reVision, prepared by Friends of the Wild Swan and Swan View Coalition, see comments and responses under Alternatives—New Alternative.

The approach taken in the forest plan revision and amendments, which is informed by the draft NCDE Grizzly Bear Conservation Strategy, is to maintain on-the-ground habitat conditions in the recovery zone/primary conservation area that have been in place during the time period that the NCDE grizzly bear population has been stable to increasing (Costello et al., 2016). Road density standards are included in the infrastructure and Salish Mountains geographic area sections of the forest plan and in the access and recreation section of the amendments and will not be eliminated.

2. Regarding the comment that the forest plan amendments should not rely on the draft Grizzly Bear Conservation Strategy and should not be prepared before habitat-based recovery criteria are completed, this is discussed in the final EIS in section 5.6.5, subsection “Alternatives considered but eliminated from detailed study.” The USFWS is continuing its work on the NCDE conservation strategy and habitat-based recovery criteria. The Forest Service has shared information with USFWS but is not in control of the process or schedule for completion of those documents. It is not necessary for the Forest Service to wait until the conservation strategy and habitat-based recovery criteria are finalized before revising or amending its plans. The Forest Service is using the best available scientific information for the plan revision and amendments. When the USFWS finalizes its documents, the Forest Service will be able to assess the conservation strategy and the habitat-based recovery criteria to determine whether there are substantive differences from the Flathead National Forest plan and amended forest plan direction and, if so, will follow established procedures to make any needed changes. Statements referring to the NCDE grizzly bear population as “recovered” have been removed. See also comments and responses under Grizzly Bear Conservation Strategy—NEPA Process and Grizzly Bear Conservation Strategy—Range of Alternatives

3. The draft NCDE Grizzly Bear Conservation Strategy explained the rationale for selecting 2011 as the baseline year (USFWS, 2013, p. 19). The basis was information showing that between 2004 and 2011, the NCDE grizzly bear population was increasing at a rate of 3 percent per year (Mace et al., 2012). Motorized route density decreased between 2004 and 2011, so, to be conservative, 2011 was selected as the baseline year for measuring levels of human activities. Subsequent research and monitoring of the NCDE grizzly bear population indicates that the population continues to be stable to increasing; that it is expanding in distribution; and that in accordance with the criteria established in the Grizzly Bear Recovery Plan (USFWS, 1993), all bear management subunits are occupied by female bears and the mortality limits are being met (Costello et al., 2016). Population and habitat monitoring will be ongoing to ensure that baseline

habitat conditions translate to the desired population trend (see the monitoring sections of the revised Flathead National Forest plan and the amendments).

4. The analysis of effects of the alternatives in the final EIS and the biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017) did consider the effects of vegetation management on the grizzly bear to the degree possible in a programmatic document. The final EIS and biological assessments include extensive citations of the published literature on grizzly bear habitat use and response to vegetation management. As required by NEPA, additional analysis will occur as site-specific vegetation management projects are proposed. The analyses for the forest plan and amendments provided in the final EIS and biological assessments satisfy the “hard look” required under NEPA.

5. The habitat management direction that would be incorporated into the forest plans under the action alternatives is intended to contribute to sustaining the recovery of the NCDE grizzly bear population within the primary conservation area and to contribute to connectivity with neighboring grizzly bear recovery zones. It does not address habitat management within the other recovery areas. The final EIS provides information about the other recovery areas and the potential for the NCDE population to serve as a source population to other recovery areas (see final EIS, section 6.5.5). In response to the comment that the entire regional metapopulation should be analyzed, additional information has been incorporated into the final EIS about the relationship between the NCDE population and the other recovery zones.

6. Substantial scientific information is available concerning grizzly bear home ranges, food sources, grizzly bear body condition, genetics, grizzly bear-human conflicts and mortalities, and habitat connectivity that was collected in the NCDE or is pertinent to the NCDE, as can be seen in the extensive reference sections of the final EIS, biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017), and biological opinions (USFWS, 2017a, 2017b). USFWS conducted a five-year status review of the grizzly bear in 2011 (USFWS, 2011) that synthesized and interpreted available information from across the range of the grizzly bear in the conterminous United States. Monitoring conducted across the NCDE includes population data compiled by MFWP and USGS and habitat data compiled by the Forest Service and other land management agencies. The plan revision and amendments would update and add to the forest plan monitoring items for the grizzly bear. Sufficient information exists to allow for the development and analysis of a reasonable set of alternatives, and continuing monitoring efforts will provide the necessary information to identify whether any changes are needed in the future.

7. Alternative 3 includes the standard NCDE-HNF Zone 1&2-STD-02 referred to in this comment. The motorized route density of 2.4 miles/square mile was based on the threshold identified in Boulanger and Stenhouse (2014). The research by Boulanger and Stenhouse provides the best available scientific information on the effects of open roads on various sex and age classes of grizzly bears and was conducted in similar environments to the NCDE. In response to public comments, the discussion in the final EIS of open road and route densities in relation to the objectives for grizzly bears in zone 1, the demographic connectivity areas, and zone 2 have been refined and supplemented (see final EIS, section 5.6.3). See also the comments and responses under Grizzly Bear—Road Density and Security Core Habitat and Grizzly Bear Conservation Strategy—Helena National Forest Amendment.

Zone 2 is not considered necessary to the recovery of the NCDE grizzly bear population. The objective for zone 2 is to allow the movement of grizzly bears, particularly males, to provide genetic interchange from the NCDE to the Greater Yellowstone Ecosystem. Additional information has been added to section 5.6.3 of the final EIS to better explain the different

objectives and rationale for each of the management zones. The direction in current Forest Service and Bureau of Land Management land management plans has not precluded grizzly bears from occupying zone 2 at low densities. Therefore, no additional habitat standards were proposed for zone 2 in the draft Grizzly Bear Conservation Strategy (USFWS, 2013, p. 91). Under all the action alternatives, desired condition NCDE-DC-WL-02 and standard NCDE-STD-WL-02 state that bear attractants will be stored in a manner that reduces the risk of grizzly bear-human conflicts and that food/wildlife attractant special orders shall apply to all NFS lands in the primary conservation area, zone 1 and zone 2. In the area to the west of Interstate 15 on the Helena National Forest, NCDE-HNF Zone 1&2-DC-02 encourages consolidation of NFS lands adjacent to highways and other efforts that reduce barriers to the genetic connectivity of grizzly bear populations. The alternative that would extend plan components, such as a limit on developed recreation sites to zone 2, was addressed in the final EIS section 5.6.5, alternatives considered but eliminated from detailed analysis. Refer to the final EIS for the rationale. See also the comments and responses under Grizzly Bear Conservation Strategy—Connectivity.

8. Regarding the comment that the Forest failed to consider findings by Bader (2016), this is referring to an unpublished report that was furnished as an attachment to a comment letter. The author questioned several methods and assumptions used by Costello et al. (2016) to estimate grizzly bear population size, trend, density, and distribution, and recommended that additional research and analysis be completed. In this unpublished report, Bader (2016) cited his published paper (Bader, 2000a) and a special report presented at a Society for Conservation Biology meeting (Bader, 2000b). Bader (Bader, 2000a) recommended that the recovery zones for grizzly bears be enlarged and linkage corridors identified, that distribution be assessed annually, and that more systematic, uniform, and unbiased methods of recording grizzly bear observations be adopted. Bader (2000b) recommended a larger habitat network for grizzly bear recovery of 190,777 square kilometers. Although Bader (2000a) stated a concern that lands outside the recovery zones receive no special management consideration as grizzly bear habitat in land management planning, the action alternatives for the Flathead National Forest and the amendment forests would provide management direction for grizzly bears in zone 1, including the Salish and Ninemile demographic connectivity areas, and also would identify zone 2, where NFS lands would be managed to provide the opportunity for grizzly bears to move between the NCDE and the Greater Yellowstone Ecosystem. Grizzly bear distribution across the NCDE is now being assessed using a systematic, unbiased method that can be updated frequently (Costello et al., 2016). The final EIS discusses habitat protection and connectivity, mortality risk, and climate change related to the NCDE and also provides information about the relationship of the NCDE to other recovery zones (see the “Grizzly bear” sections 3.7.5 and 6.5.5 in the final EIS for more details).

Best Available Scientific Information—Timber

Comment (letter numbers 290, 2940)

The forest plan and draft EIS should consider new science regarding thinning and mountain pine beetle that does not support the use of such treatments as thinning to address bark beetle outbreaks.

The forest plan and draft EIS should provide justification and the science used to develop the desired conditions related to tree density. The desired conditions to reduce density do not seem to be supported by the statements that current densities are generally at levels within the range of natural variation.

The Forest should develop a desired condition for unlogged complex early seral forest resulting from high- and moderate-severity fires, which should be within the natural range of variation for this ecosystem type (defined in the forest plan). Unless the plan provides this plan component for ecological integrity, it needs to reject intensive salvage logging in burned areas except as needed for public safety and infrastructure protection. In any case, the plan must acknowledge the adverse effects of any salvage logging that the plan allows, in accordance with the best available scientific information.

Response

The forest plan provides programmatic direction, with the broad desired conditions of creating or maintaining resilient or resistant forests in the face of potential future disturbances, including the influence of climate change. The forest plan does not dictate specific types of treatment to achieve these desired conditions. These decisions would be made at the project level and would be based on site-specific conditions and resource objectives. Relevant science would be evaluated at the project level, as appropriate, in order to conduct the analysis and determine effects of possible treatments. For example, this might include evaluation of the information cited in the publication referenced in this comment, if treatments in lodgepole pine addressing mountain pine beetle hazard are proposed. Forest service entomologists acknowledge that thinning in lodgepole pine is less effective during periods with high levels of beetle populations.

Regarding the comment related to the use of canopy cover as an indicator of forest density, first, forest densities (or other key characteristics/indicators) can be within the range of natural variation, yet it may still be desirable to reduce them in portions of the Forest. This does not imply that the Forest would reduce them to the point where they would be outside/below the natural range of variation. Maintaining conditions within the desired range is the goal for all key ecosystem characteristics. Second, the forest plan desired condition for forest density has been refined for the final plan for several reasons, some of which are related to the concerns raised in the comment. For the most part, based on current knowledge, forest densities on the Flathead appear to be within the natural range of variation at a broad, programmatic scale. Rather than focusing on the quantitative side, the desired condition instead focuses on the aspects of forest density that, when integrated with other ecological, social or economic factors, are considered most relevant and meaningful for the Flathead, such as the role that density plays in achieving resilient forests, providing desired wildlife habitat, lowering fire hazard, or maintaining vigorous, productive forest conditions. Refer to the analysis of forest density in section 3.3.5 of the final EIS and to Trechsel (2016, 2017b) for additional details about development of plan desired conditions and the changes to the desired condition for forest densities in the final plan.

Also, to address the concern that a desired condition for large amounts of forest at low densities could be met by “vast amounts of clearcutting,” the desired proportions of the early successional forest size class that would be created by clearcutting (or more likely by fire) are guided by the forest plan components related to forest size class and seedling/sapling size class in particular (FS-DC-TE&V-10 and 11). As the analysis in the final EIS indicates, wildfire has created most of the early successional forest on the Flathead, which comprises most of the forests at lower density/low canopy cover, because of the small tree sizes and crown widths of seedling trees. Fire is anticipated to be the factor that creates most of the early successional forest in the foreseeable future as well. The desired conditions for forest density is only one of many plan components that guide the harvest of trees across the Flathead.

The plan includes components for burned forest conditions (FS-DC-TE&V-25) and the habitat for associated species. Whether salvage would occur within portions of burned forest would be

evaluated at the site-specific level and would be guided by the appropriate plan components. The majority of the Flathead National Forest is in wilderness, recommended wilderness, or inventoried roadless areas, where harvest, including salvage, would be prohibited or greatly limited. Unsalvaged burned areas are currently present due to the large areas of recent fire (over half of the burned areas are within existing wilderness), and unsalvaged burn areas are expected to be present in the future at varying levels. If a burned area is potentially available for salvage harvest (dictated by a number of factors, including accessibility), then analysis at the project level would determine where, how much, what treatments, etc., would occur, with the deciding officer weighing ecological, social, and economic factors in making his or her decision. Refer also to the comments and responses under Forest Products—Salvage.

Best Available Scientific Information—Wildlife Lynx Connectivity Management Area

Comment (letter numbers 2762, 2904, 2940)

The forest plan did not use the best available science because it failed to consider Kosterman's (2014) thesis. The NRLMD is outdated, so the Forest must carefully review and incorporate updated information, including the Lynx Conservation Assessment and Strategy (ILBT, 2013) and the report by the species status assessment team (Bell et al., 2016).

The forest plan should identify and designate a corridor management area for Canada lynx consistent with the best available science information, including Squires et al. (2013).

Response

See also responses to comments under Canada Lynx—Vegetation Management and Canada Lynx—Draft EIS Analysis, Alternatives, and Standards.

The Forest reviewed and considered Kosterman, the Lynx Conservation Assessment and Strategy (ILBT, 2013) and the report by the species status assessment team (Bell et al., 2016). The Forest considered an alternative for a connectivity management area (see final EIS section 2.4.6, subsection "Alternatives considered but eliminated from detailed study," Wildlife habitat connectivity). Putative travel corridors for Canada lynx identified by Squires and others (2013)) were considered for the wilderness evaluation, management area allocations, and desired conditions for key connectivity areas in the forest plan (Kuennen, 2017a). For example, the preferred alternative, B modified, includes management areas supportive of Canada lynx habitat connectivity along the Canadian border in the transboundary region, the Whitefish Divide, Jewel Basin, and along the west face of the Swan Divide. These areas include recommended wilderness (management area 1a), backcountry (management area 5), and general forest low-intensity vegetation management (management area 6a). The preferred alternative also includes areas along the southern boundary of the Swan Valley geographic area and near the confluence of the North Fork of the Flathead River, Middle Fork of the Flathead River, and South Fork of the Flathead River as management area 6a to emphasize wildlife habitat connectivity, including lynx. Key connectivity areas are identified and addressed in desired conditions for the Forest's geographic areas (see figure B-54), along with desired conditions for highway crossings, highway approaches, and lands. The Forest reviewed the NRLMD. All alternatives include standards LINK S1 and ALL S1 and guideline ALL G1, which require the forest to maintain habitat connectivity for Canada lynx (see forest plan, appendix A). These plan components support habitat connectivity for Canada lynx. Canada lynx standards apply irrespective of management

area. See the Forest's biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) and the USFWS biological opinion (USFWS, 2017b) for more details.

Best Management Practices

Best Management Practices—Aquatics

Comment (letter numbers 290, 2765, 2855, 2904)

The Forest may not have incorporated best management practices for water quality. The Forest cites these best management practices in its section on infrastructure, but it is unclear whether and to what extent the agency incorporated these practices into the actual plan components.

Response

Best management practices are discussed in a standard under water quality:

FW-STD-WTR-02: Project-specific best management practices (including both Federal and State of Montana best management practices) shall be incorporated in land use and project plans as a principle mechanism for controlling non-point pollution sources, in order to meet soil and watershed desired conditions and to protect beneficial uses.

One of the ways the Forest addresses the Clean Water Act is by implementing the iterative best management practices process outlined in the Soil and Water Conservation Handbook (Forest Service Handbook 2509.22) at the project level of analysis and implementation. Best management practices are mechanisms to develop and apply detailed, site-specific prescriptions and solutions.

Best Management Practices—Motorized Over-Snow Vehicles

Comment (letter numbers 2879, 2904)

The Forest should locate motorized over-snow vehicle routes, trails, and areas to minimize conflicts, as required by the executive orders and the travel management rule.

Response

See the draft record of decision for a discussion of how the Forest meets the minimization criteria set forth in Executive Order 11644 as amended by Executive Order 11989 for motorized over-snow vehicle use.

Canada Lynx

Canada Lynx—Analysis by Lynx Analysis Unit

Comment (letter numbers 290, 2762, 2888, 2904)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should reevaluate the lynx analysis unit size so the units reflect the home range of female lynx in order to determine whether changes to the NRLMD need to be made.

2. The Forest should analyze the impacts of NRLMD vegetation standard exceptions in the individual lynx analysis units.
3. The Forest should address how the project's adverse modification of denning and foraging habitat will affect lynx distribution by lynx analysis unit. This is important because the agency readily admits that the lynx analysis units already contain a "relatively large percentage of unsuitable habitat." The NRLMD record of decision states, "The national forests subject to this new direction will provide habitat to maintain a viable population of lynx in the northern Rockies by maintaining the current distribution of occupied lynx habitat, and maintaining or enhancing the quality of that habitat" (p. 40).
4. The Forest should address how motorized access (both summer and winter) into areas occupied by lynx directly, indirectly, and cumulatively impacts the species.
5. The Forest should discuss whether areas designated suitable for motorized over-snow vehicle use may constitute lynx denning habitat.
6. The Forest should specify that various monitoring questions for lynx would be analyzed per lynx analysis unit.

Response

1. The rationale for the use of lynx analysis units is discussed in 3.7.5, Canada lynx, subsection "Methodology and analysis process," in the final EIS and on pages 442-443 in volume 1 of the draft EIS. The Flathead's lynx analysis units are consistent with guidance in the Lynx Conservation and Assessment Strategy (ILBT, 2013):

The size of the LAU [lynx analysis unit] reflects female home range size in the geographic unit. A sufficient amount of habitat must be present within the LAU to support a female lynx. For example, in the western United States, it appears that at least 26 km² (10 mi²) of primary vegetation (e.g., spruce/fir) must be present. The arrangement of habitat within the LAU should take into consideration the daily movement distances of resident females. . . . Since the LAU represents a hypothetical female home range, and is the basis for analysis, it can be larger and contain more lynx habitat than an actual home range. (p. 87)

As part of the forest plan revision process, the Forest conducted a GIS analysis to verify that lynx analysis units on the Forest contain at least 10 square miles capable of producing primary vegetation (e.g., spruce/fir forest). The Forest also considered movement distances, specifically those reported by Squires et al. (2013). Using global positioning system (GPS) collars programmed to record locations every 30 minutes every other day for 33 individual lynx during winter and 28 lynx during summer, the average daily movement rate of those lynx in Montana was 6.9 kilometers/day (4.2 miles/day) (Squires et al., 2013).

2. The Forest's biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) discusses (and figure B-11 displays) the distribution of projects using NRLMD vegetation standard exceptions in the individual lynx analysis units. The forest plan is a programmatic framework for site-specific management. Future projects will be designed to be consistent with the forest plan. Impacts in each lynx analysis unit are analyzed at the site-specific project level. In section 3.7.5, subsections "Canada lynx" and "Canada lynx critical habitat," it is stated that the Forest does not know exactly where future effects would occur. However, as discussed in the final EIS, section 3.7.5, Canada lynx, subsection "Consequences of alternatives," standards VEG S1 and VEG S2 provide

limits on treatments in each lynx analysis unit. In addition, the biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) provides a more detailed discussion of anticipated treatments that could occur under VEG S5 and VEG S6 by lynx analysis unit. The biological assessment includes detailed sections on Canada lynx and the critical habitat primary constituent elements, as well as a discussion of viability. The Forest consulted with the USFWS on the effects of the forest plan. Their findings are contained in the biological opinion (USFWS, 2017b). Also see the comments and responses under Canada Lynx—Vegetation Management.

The Lynx Conservation and Assessment Strategy (ILBT, 2013) defines “lynx habitat currently in an unsuitable condition.” As explained in the Canada lynx subsection of 3.7.5 in the final EIS, under natural conditions, lynx habitat goes through a stage where it is temporarily unsuitable following activities or events such as wildfire or regeneration harvest. In section 3.7.5 of the final EIS, subsection Canada lynx, “Affected environment,” the effects of past wildfires and regeneration harvest are quantified for each lynx analysis unit for comparison with NRLMD vegetation standards VEG S1 and VEG S2. Some lynx analysis units contain a relatively large percentage of habitat that is currently in an unsuitable condition, mainly due to wildfire. Modeling indicates that all the alternatives would provide lynx habitat within the natural range of variation. The natural range of variation is also discussed at the lynx analysis unit scale. The final EIS discusses how these activities have contributed to the existing condition of lynx habitat and critical habitat on the Flathead National Forest. If a project such as timber harvest or thinning is proposed in Canada lynx habitat or critical habitat, the site-specific effects on habitat quality would be assessed at that time and section 7 consultation would be completed as appropriate.

3. As discussed in section 3.7.5, Canada lynx, “Affected environment—Canada lynx population” of the final EIS, the current distribution of occupied lynx habitat, based upon radiotelemetry research by Squires and others as well as DNA samples, occurs across the Forest’s portion of critical habitat unit 3. Squires has collected satellite telemetry data in the North Fork, Middle Fork, and South Fork of the Flathead River watersheds, and these watersheds are all known to be occupied by Canada lynx. The Flathead National Forest has confirmed DNA of additional lynx, collected during non-invasive monitoring efforts, including lynx in the Swan Valley and Salish Mountains geographic areas. More specific scientific information on the distribution of lynx by lynx analysis unit is not available. The 2012 planning rule does not have the same requirements for assessing viability as the 1982 planning rule. The 2012 planning rule does not state that habitat must be “well distributed.”

4. See the comments and responses under Wildlife—Impacts on Lynx from Motorized Access.

5. See the comments and responses under Wildlife—Impacts on Lynx from Motorized Access.

6. As clarified in chapter 5 of the forest plan, monitoring indicators are applicable to each lynx analysis unit.

Canada Lynx—Consultation with USFWS

Comment (letter numbers 2762, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Flathead National Forest’s forest plan is in violation of the Endangered Species Act, the National Forest Management Act, the Administrative Procedures Act, and the National Environmental Policy Act because it does not have a take permit from the USFWS.

2. The Forest Service should work with the USFWS informally and through the section 7 consultation process to ensure that the aggregate forest plan components constitute a conservation program that promotes recovery, not merely a mechanism that reduces adverse effects and prevents jeopardy decisions. The draft EIS does not indicate that the Forest Service has communicated with the USFWS about how special management for critical habitat will be incorporated into the forest plan or that the Forest Service has begun consultation to determine whether proposed activities constitute adverse modification. It is uncertain whether the “protections” (i.e., the plan components from the NRLMD) are adequate to protect critical habitat and whether “special management” beyond the NRLMD may be required. This project will adversely affect lynx critical habitat in violation of the Endangered Species Act; the biological assessment/biological evaluation needs to be rewritten to reflect this information.

3. The analysis does not meet the requirements of the USFS/USFWS conservation agreement.

Response

1. In March 2007, the USFWS issued a biological opinion and incidental take statement regarding the effects of the NRLMD on lynx (USFWS, 2007), which was extended in March of 2017. The Flathead National Forest submitted a biological assessment to the USFWS on its forest plan (Kuennen, Van Eimeren, & Trechsel, 2017). The USFWS issued its biological opinion (USFWS, 2017b) on the forest plan, including an incidental take statement, in November 2017.

2. The Forest began meeting with other agencies (including the USFWS) to discuss the forest plan revision process in December 2013. The Forest informally consulted with the USFWS on the forest plan revision beginning in August 2016, as documented in the Forest’s biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017). The biological assessment was submitted for formal consultation in March 2017. The biological assessment analyzes the effects of the forest plan on Canada lynx as well as its critical habitat. The Forest’s biological assessment made a determination that the programmatic framework of the forest plan *may affect, is likely to adversely affect* Canada lynx and its critical habitat. The USFWS biological opinion (USFWS, 2017b) addresses jeopardy, Canada lynx recovery, incidental take, and adverse modification of critical habitat. The Forest’s biological assessment and the USFWS biological opinion are posted on the Forest’s forest plan revision website (www.fs.usda.gov/goto/flathead/fpr) so that they will be available to the public at the start of the objection period. The forest plan is not a project. Additional consultation will occur as site-specific projects are implemented. 3. The USFS/USFWS conservation agreement was in effect only until the forest plans were amended to provide guidance to conserve lynx, which was accomplished by the Northern Rockies Lynx Management Direction in 2007 (USDA, 2007a) and is incorporated into the forest plan (see appendix A).

Canada Lynx—Draft EIS Analysis, Alternatives, and Standards

Comment (letter numbers 108, 2574, 2762, 2824, 2869, 2875, 2888, 2904, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The habitat mapping process for lynx should be reviewed, improved, and opened up to the public. The Forest should consider a grading system for quality of lynx habitat within lynx analysis units based on presence, habitat elements, and ability to manage habitat. The District Court of Montana ruled this year that the USFWS acted illegally when it excluded lynx habitat in the designation of critical habitat. The designation should be made based on where lynx were

when they were listed in 1999. Lynx habitat should be based on project-level analysis and not the current faulty lynx map.

2. Retaining some flexibility to manage lynx according to the latest science is necessary, and the NRLMD makes changes cumbersome. The proposed “guidelines” for recreation in occupied lynx habitat and critical habitat should become enforceable standards. The standards included in the Northern Rockies Lynx Management Direction are now outdated and are no longer consistent with the best available scientific information, including but not limited to Kosterman (2014), Squires and others (2010), the Lynx Conservation and Assessment Strategy (2013), and recommendations from the Species Status Assessment team.

3. The EIS needs to meet NEPA’s “hard look” requirements to consider how the plan will directly, indirectly, and cumulatively impact the Canada lynx and its critical habitat. The Interagency Lynx Biology Team’s Lynx Conservation and Assessment Strategy and recommendations from the Species Status Assessment team should be included.

4. The final EIS should include an analysis of effects to lynx, lynx habitat, and habitat connectivity due to vegetation treatments and other management in the wildland-urban interface. Connectivity areas are needed that are clearly delineated and that include standards and guidelines for these locations to protect lynx movement. Existing wilderness areas and recommended wilderness areas are critical for sustaining populations and for providing permeable habitat and linkage zones for Canada lynx.

5. The Forest Service’s analysis that its alternatives will not adversely impact lynx habitat based on an assertion of no “permanent loss” of boreal forest is insincere; the analysis should incorporate the best available science, avoid adverse modifications to the primary constituent elements that make up lynx critical habitat, and provide ecological conditions necessary to contribute to the recovery of lynx.

6. The section “alternatives considered but eliminated from detailed study” (draft EIS, volume 1, p. 30) should be rephrased. This section rejected from consideration an alternative that would prohibit vegetation management and other activities in lynx critical habitat. The draft EIS states that “commenters suggested that management in lynx critical habitat is illegal” (p. 33), which is different from commenters suggesting that management prohibitions in critical habitat should be considered as an alternative.

Response

1. The habitat mapping process for lynx was reviewed and updated and is open to the public. The updated lynx habitat map was published in the draft forest plan (May 2016). Pages 442-443 of the draft EIS explain the process used to update the map in 2013, cite the planning record document that explains the process in more detail, and reference the map of lynx habitat (figure B-17). Thus, the public had an opportunity to comment on the mapping process. Section 3.7.5, Canada lynx, “Methodology and Analysis Process” in the final EIS also discusses the mapping process. Appendix C to the biological assessment submitted to the USFWS (Kuennen, Van Eimeren, & Trechsel, 2017) describes the map updates in detail, and this document is available to the public on the Forest’s forest plan revision website. Habitat mapping is verified at the project level. The designation of critical habitat on the Forest encompasses the area believed to be occupied by lynx when the lynx was listed under the Endangered Species Act, as confirmed by more recent research and monitoring. See the comments and responses under Canada Lynx—Analysis by Lynx Analysis Unit for a discussion of occupied habitat.

The lynx habitat map is not based upon an arbitrary 4,000-foot elevation, it is based upon local snow depth data and habitat types with the potential to provide boreal forests capable of supporting lynx. Squires and others are working on a new model of lynx habitat based upon existing conditions and quality, but it is not yet available, so it is not possible for the Forest to establish a grading system for the quality of lynx habitat within lynx analysis units. The Forest cited Squires and others (2013), which includes a coarse map of lynx habitat quality based upon a resource selection function, and this map was considered when developing plan components.

Critical habitat unit 3 encompasses the current distribution of lynx identified by Squires et al. (2013). In its ruling, the District Court of Montana did not find fault with the USFWS designation of critical habitat for the Flathead National Forest.

2. As stated in the NRLMD record of decision (USDA, 2007a, p. 2), the purpose of the management direction is to conserve and promote the recovery of Canada lynx by reducing or eliminating adverse effects from land management activities on National Forest System lands while preserving the overall multiple-use direction in the existing plans. The Forest also considered these purposes in developing the Flathead's forest plan, and this is described in the biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017), the forest plan, and the final EIS. Publications by Kosterman (2014), Squires and others (2010), the Lynx Conservation and Assessment Strategy (ILBT, 2013), and recommendations from the Species Status Assessment team were considered in the final EIS (see section 3.7.5 subsection Canada lynx). Carrying forward management direction from the NRLMD does not preclude making future changes if warranted. The forest plan is intended to be adaptive and can be amended or revised as needed in the future to consider the best available scientific information as well as changing environmental conditions. Also see the comments and responses under Wildlife—Impacts on Lynx from Motorized Access for a discussion of recreation and lynx.

The forest plan includes management direction from the NRLMD but is not limited to that. The Forest's forest plan is updated based upon requirements of the 2012 planning rule and a wealth of new scientific information (cited in the final EIS and contained in the planning record). In developing the forest plan, the responsible official considered Kosterman (2014), Squires and others (2010), the 2013 Lynx Conservation Assessment and Strategy (ILBT, 2013), and recommendations from the Species Status Assessment team on Canada lynx in the Expert Elicitation Workshop Report. These documents are discussed in detail and cited in the Forest's biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017). The biological assessment also addresses effects on the primary constituent elements (PCEs) that make up lynx critical habitat. The USFWS biological opinion (USFWS, 2017b) addresses adverse modification to critical habitat and discusses how the forest plan will contribute to the recovery of lynx. The USFWS biological opinion is summarized in the draft ROD and is available to the public on the Forest's forest plan revision website, along with the biological assessment (www.fs.usda.gov/goto/flathead/fpr).

3. The Interagency Lynx Biology Team's Lynx Conservation and Assessment Strategy (ILBT, 2013) and recommendations of the Species Status Assessment team were considered and are discussed in section 3.7.5, subsections "Affected environment—Canada lynx population" and "Cumulative effects—Canada Lynx Critical Habitat Unit 3" of the final EIS and in the biological assessment for the forest plan (Kuennen, Van Eimeren, & Trechsel, 2017). The final EIS meets NEPA's "hard look" requirements because it is firmly grounded in science that is referenced in the affected environment section of the biological assessment, the final EIS, and other plan documents: (1) the final EIS discloses both beneficial and negative effects; (2) it considers how

the forest plan will indirectly and cumulatively impact the Canada lynx and its critical habitat; (3) it considers a reasonable range of alternatives; (4) methodologies, uncertainties, assumptions, and opposing scientific views are disclosed; (5) alternatives include plan components that would contribute to ecological, social, and economic sustainability while reducing environmental impacts; (6) the final EIS includes qualitative and quantitative analysis of anticipated effects as well as maps and tables illustrating the potential distribution of effects; and (7) it includes additional alternatives based upon public comments that were considered but eliminated from detailed study, along with the Forest's rationale.

4. The effects to lynx and lynx habitat of vegetation treatments in the wildland-urban interface, including actions on other land ownerships, are examined and disclosed in section 3.7.5 of the final EIS and on pages 451-453, 456-457, 468, and 470 in volume 1 of the draft EIS. Lynx standard ALL S1 applies to vegetation management projects in lynx analysis units. Flathead National Forest lynx analysis units include the wildland-urban interface, and therefore standard ALL S1 protects lynx and lynx habitat connectivity in the wildland-urban interface. Projects must comply with standards. Additionally, plan components for geographic areas have connectivity areas that are clearly delineated, and the final EIS indicates which areas correspond to putative travel corridors identified by Squires and others (2013) to protect lynx movement.

The responsible official will consider the importance of existing wilderness areas and recommended wilderness areas in sustaining the northern Rockies Canada lynx population and providing linkage for Canada lynx when making the final administrative recommendation. The wilderness evaluation considered recommended wilderness (management area 1a) providing linkage with Canada and considered putative travel corridors identified by Squires and others (2016). Under alternative B modified, recommended wilderness would include, but would not be limited to, the Tuchuck-Whale recommended wilderness area along the Canadian border, the Jewel Basin recommended wilderness area, and the Swan Front recommended wilderness area. Standards associated with management area 1a contribute to connectivity for Canada lynx, as discussed in section 3.7.5 of the final EIS. See also the comments and responses under Wildlife—Modeling and Managing Connectivity for discussions of specific areas identified for connectivity for multiple species.

5. The Forest's final EIS and biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) address the primary constituent elements in detail. These documents as well as the USFWS biological opinion (USFWS, 2017b) document how the forest plan would provide ecological conditions necessary to contribute to the recovery of lynx and would avoid adverse modification of critical habitat. These documents are available on the Forest's forest plan revision website (www.fs.usda.gov/goto/flathead/fpr).

6. The title and description of this suggested alternative have been modified in the final EIS in response to public comment.

Canada Lynx—Habitat

Comment (letter number 2762)

The forest plan needs to improve lynx management so that the Forest is maintaining and improving lynx habitat to provide for the recovery and viability of lynx and their necessary habitat elements, including but not limited to standards that protect key winter habitat.

Response

The Forest consulted with the USFWS on the effects of the forest plan. The USFWS biological opinion (USFWS, 2017b) explains how the forest plan would provide for the recovery and viability of Canada lynx and their necessary habitat elements, including winter habitat. Also see the comments and responses under Canada Lynx—Vegetation Management and Canada Lynx—Draft EIS Analysis, Alternatives, and Standards.

Canada Lynx—Impacts from Grazing

Comment (letter number 2888)

The final EIS should improve the analysis of the potential impact of grazing on Canada lynx. One study, for example, that found that snowshoe hares (*Lepus americanus*) decreased with grazing, probably through lack of suitable cover in summer, and that white-footed mouse (*Peromyscus spp.*) and red-backed vole (*Clethrionomys gapperi*) populations appeared to be lower in grazed areas, likely due to reduced protective and nesting cover.

Response

As stated in section 3.7.5 of the final EIS, subsection “Canada lynx,” the Forest knows of no existing research indicating that grazing or browsing by domestic livestock on Federal lands would reduce the snowshoe hare prey base or would have a substantial effect on lynx (ILBT, 2013). However, because it is possible that the limited livestock browsing or grazing that occurs in two geographic areas on the Forest could reduce the forage and dense horizontal cover needed by snowshoe hares, all alternatives include NRLMD plan components for grazing GRAZ O1, GRAZ G2, GRAZ G3, and GRAZ G4 (see forest plan appendix A). With these components in place, the effect of livestock grazing on lynx and lynx habitat was judged to be minimal across the Forest and the Northern Rockies analysis area (USFWS, 2007). Based upon the best available scientific information, there would continue to be little or no effect on lynx attributable to livestock grazing so there is no need for additional analysis.

Canada Lynx—Lynx Trapping

Comment (letter numbers 2904, 2940)

The Forest should make it clear that the Forest has the authority to regulate trapping on National Forest System lands based upon Forest Service Manual 2643.1. The final EIS should include an alternative that controls trapping of other species to reduce the effects of incidental trapping within the Forest on lynx. The number of miles of roads and trails open to motorized use within mapped lynx habitat should be analyzed for effects on incidental trapping of lynx.

Response

Forest Service authority to regulate trapping on NFS lands is clarified in the final EIS. Although the Forest has the authority to restrict hunting and trapping on NFS lands, the Forest generally does not do so unless state fish and wildlife laws or regulations conflict with Federal laws or State laws and regulations would permit activities that conflict with the land and resource management responsibilities of the Forest Service. Montana is closed to the trapping of Canada lynx. The Forest does not know of scientific evidence indicating that impacts to Canada lynx would warrant additional restrictions other than those already imposed by the State of Montana. Section 2.4.6 of the final EIS has a section entitled “Alternatives considered but eliminated from detailed study.” This section includes an alternative to “Close National Forest System lands to trapping and/or hunting.” Because trapping seasons occur in the winter, the final EIS analyzes the areas and miles

of routes open to motorized over-snow vehicle use and the effects of incidental trapping within lynx habitat in section 3.7.5, subsection “Canada lynx.”

Canada Lynx—Road Impact

Comment (letter numbers 2812, 2904)

Montana is the only state that allows lynx trapping. The Forest Service should include plan components that reduce the size of the road system to better protect Canada lynx and should include infrastructure plan components that address adverse impacts from off-road vehicles, especially in relation to Canada lynx and indirect or cumulative effects. The forest plan should give particular attention to roads threatening connectivity with lynx populations in Canada, if recreation opportunity spectrum settings along the border permit motorized vehicle use.

Response

As stated in the Lynx Conservation and Assessment Strategy (ILBT, 2013), “Few studies have examined how lynx react to human presence. Some anecdotal information suggests that lynx are quite tolerant of humans, although given differences in individuals and contexts, a variety of behavioral responses to human presence may be expected” (Staples 1995, Mowat et al. 2000)” (p. 80).

Montana does not allow lynx trapping. The forest plan includes infrastructure plan components that pertain to roads and motorized trails (where off-road vehicle use is allowed). As stated in section 3.7.5 of the final EIS, although standards FW-STD-IFS-02 and GA-SM-STD-01 encompass the whole Forest and are intended to benefit the grizzly bear, they also minimize the risk of potential indirect or cumulative effects on Canada lynx (including connectivity within and between home ranges, connectivity with Canada, and mortality by vehicles, incidental trapping, and illegal shooting). The forest plan also includes forestwide guideline FW-GDL-REC-03, which limits motorized over-snow vehicle use in lynx habitat, thus reducing potential risks. The forest plan includes a large area of recommended wilderness (management area 1b) along the Canadian border where motorized and mechanized use is not suitable and the recreation opportunity spectrum is “primitive.”

As stated in the Lynx Conservation and Assessment Strategy (ILBT, 2013, p. 78), a 2005 study by Alexander et al. suggested that traffic volumes between 3,000 and 5,000 vehicles per day may be the threshold above which successful crossings by carnivores are impeded. This is the kind of traffic level found on highways, not on backcountry NFS roads on the Forest.

Canada Lynx—Supplemental EIS and Kosterman Thesis

Comment (letter numbers 2762, 2940)

The Forest Service should write a supplemental EIS for the Northern Rockies Lynx Management Direction and reinstate consultation with the USFWS to publicly disclose and address the findings of the Kosterman thesis (2014), asserting it is now the best available science. The Forest Service should not reject incorporating new science from Kosterman into an action alternative considered in the EIS.

Response

The Forest Service met with Kosterman regarding her findings (see Marten, 2016). She is continuing to work on a paper for publication in a peer-reviewed journal. If Kosterman or other

scientists develop a more refined classification of lynx habitat, this science will be considered when it is available. As stated in section 2.4.6 of the final EIS under “Alternatives considered but eliminated from detailed study,” the Forest considered Kosterman’s (2014) thesis and provided sufficient rationale for eliminating the findings as an action alternative. See also Canada Lynx—Vegetation Management.

Canada Lynx—Vegetation Management

Comment (letter numbers 290, 2574, 2762, 2888, 2904, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should clarify how much (if any) vegetation management is permissible in lynx designated critical habitat and how it would affect lynx recovery. The 2014 final rule (79 FR 54825) states, “Timber harvest and management are dominant land uses (68 FR 40075); therefore, special management may be required depending on the silvicultural practices implemented. Timber management practices that provide for a dense understory are beneficial for lynx and snowshoe hares.”
2. The Forest should take steps to ensure that lynx winter habitat on the Forest is properly managed and conserved based upon new papers on the importance of providing horizontal cover for lynx. The Forest fails to adequately identify, manage, and recruit mature, multistory forest stands that are important for lynx winter habitat and lynx conservation. The Forest does not properly analyze the direct, indirect, and cumulative impacts of the forest plan and its vegetative prescriptions on winter lynx habitat. Old-growth should not be equated to winter lynx habitat. Timber harvest, salvage logging, and precommercial thinning in lynx habitat *would not* benefit lynx or hares, especially in the long term; conversely, they *would* benefit lynx and/or hares in the long term. Limitations on precommercial thinning are shortsighted (especially in post-fire areas). The forest plan and final EIS should be improved to better address the effects of vegetation management (in both green and dead forests) on Canada lynx and their critical habitat. The focus of the NRLMD is on foraging habitat provided by early seral regeneration areas alone.
3. The estimated acres for exceptions to standards VEG S5 and VEG S6 in the draft EIS appear to be arbitrary. It is not clear why the Forest reported a range of exception acres. The Forest should identify the maximum extent of NLRMD vegetation standard exceptions. The draft EIS discussion of exceptions and exemptions to NRLMD vegetation standards is not clear. Any exceptions to plan standards beyond what is allowable in the standard must go through the plan amendment process; such decisions cannot be made through USFWS agreements.
4. The draft EIS discussion of NRLMD vegetation standards was based upon faulty science; the Forest should change the standards. The Forest failed to consider Kosterman’s 2014 thesis. The Forest failed to consider Griffin and Mills’s 2007 article. The Forest failed to consider Squires’s September 27, 2002, comments on the lynx management direction.
5. The NRLMD does not have any connectivity criteria. The Forest should use Squires (2013) for identification of travel corridors. Travel corridors must have 60 percent canopy cover.

Response

1. Vegetation management is permissible in critical habitat, and the critical habitat final rule recognizes that it can benefit lynx. As stated in the 2014 critical habitat final rule (USFWS, 2014a):

Exactly how much of each of the physical and biological features must be present and specifically how each must be spatially arranged within boreal forest landscapes to support lynx populations over time is unknown. In considering lands for designation as critical habitat, the USFWS focused on boreal forest landscapes of sufficient size to encompass the temporal and spatial changes in habitat and snowshoe hare populations to support interbreeding lynx populations over time. (p. 54815)

As stated in the Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx (USFWS, 2014c):

The boreal forest landscape is naturally dynamic. Forest stands within the landscape change as they undergo succession (transition from one stage in the development of a mature forest to another) after natural or human-caused disturbances such as fire, insect epidemics, wind, ice, disease, and forest management (Elliot-Fisk 1988; Agee 2000). As a result, lynx habitat within the boreal forest landscape is a shifting mosaic of habitat patches of variable and continually changing quality. That is, boreal forests contain stands of differing ages and conditions, some of which provide lynx foraging or denning habitat (or may provide these in the future depending on patterns of disturbance and forest succession) and some of which serve as travel routes for lynx moving between foraging and denning habitats (McKelvey et al. 2000c; Hoving et al. 2004). (p. 8)

The forest plan takes into consideration the landscape changes described above. At the project level, silvicultural and timber management practices comply with plan components, including standards and guidelines that are beneficial for lynx and snowshoe hares.

2. Habitat used by lynx in winter is described in the final EIS, section 3.7.5, Canada lynx, subsection “Affected environment,” and on page 445 in volume 1 of the draft EIS and is based on Squires and others (2010). The importance of providing horizontal cover for lynx has been known for some time and was incorporated in NRLMD standards for young (standard VEG S5) as well as for multistory mature forests (standard VEG S6) (see the forest plan, appendix A). Old-growth and winter habitat for lynx are *not* synonymous. To provide winter habitat for lynx, there must be a dense understory that provides snowshoe hare habitat. Not all old growth is in lynx habitat, nor does all old growth have a dense understory. Multistory forests with dense understories providing winter hare and lynx habitat are protected by NRLMD standard VEG S6, with specific exceptions and exemptions identified and analyzed in the NRLMD’s final EIS (USDA, 2007b) and in the Forest’s final EIS. As explained in the Forest’s biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) and final EIS, the programmatic framework of the forest plan provides direction to identify, manage, and recruit mature, multistory forest to benefit lynx. The location of existing multistory forest is identified at the project level because the Forest does not have the ability to identify forest with a dense understory at the forestwide scale. For the forest plan, the Forest has analyzed the effects of the vegetation standards and their exceptions in a programmatic way, but additional analysis appropriately occurs at the project level, as required by NEPA, the National Forest Management Act, and the Endangered Species Act. The amount, distribution, and timing of vegetation management (including timber harvest, salvage logging, and precommercial thinning) goes through consultation for site-specific projects to ensure that lynx habitat (including winter habitat) on the Forest is properly managed and conserved, based upon the best available scientific information, recognizing that conditions change over time. The final EIS discusses

limitations on precommercial thinning in post-fire areas and the path forward to address site-specific conditions on the Forest.

3. The discussion of exceptions and exemptions is clarified in the final EIS. VEG S5 and VEG S6 (see appendix A of the forest plan) are standards, with exceptions and exemptions allowed for specific purposes. The Forest would like to clarify that the estimated exception and exemption acres (as well as the 6 percent analyzed in the NRLMD) are not standards. These are programmatic estimates made by the Forest Service that are used by the USFWS for estimating the anticipated level of incidental take. The Forest has consulted with the USFWS on the forest plan. The Forest reported a range of exception acres; the upper end of the range would be the maximum extent of NRLMD vegetation standard exceptions. Until the Forest goes through site-specific analysis on a project, it is not possible to know the exact acreage or specific locations or specific effects of areas to be treated because this depends upon a wide variety of factors. For example, some areas the Forest anticipates treating may not have the dense understory conditions that provide hare and lynx habitat, or a wildfire may burn areas that the Forest had planned to treat, or the Forest may not have the budget to conduct some treatments. The Forest has described the effects of potential vegetation treatments in lynx habitat or critical habitat to the best of its ability at the programmatic level. Additionally, the Forest consults with the USFWS on the use of exceptions or exemptions at the site-specific project level and discloses effects to the public through the site-specific NEPA process. The Forest monitors the acres/locations of exceptions and exemptions, and this information will be made available to the public in the Forest's biennial forest plan monitoring report.

The estimates for exceptions and exemptions to VEG S5 and VEG S6 in the draft EIS were not arbitrary; they were based upon the Forest's best estimate at the time. Between the draft EIS and the final EIS, the Forest conducted a detailed GIS process to refine the estimated acres by exception category and lynx analysis unit location as much as possible given the programmatic nature of a forest plan. In the biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) and final EIS, the Forest has refined and clarified information on where activities could occur based upon management areas, location of the wildland-urban interface, and exemptions or exceptions by lynx analysis unit, to the best of its ability at the forest plan level. Some commenters stated that the proposed new exception to NRLMD standard VEG S6 may lead to less understory in lynx habitat. Section 3.7.5 of the final EIS, in the sections on the consequences of alternatives B modified, C, and D, acknowledges that the proposed changes to the NRLMD could have short-term adverse effects on Canada lynx for this reason.

4. Kosterman's (2014) thesis is cited in the final EIS. Vegetation desired condition FW-DC-TE&V-19 incorporates information from Kosterman's thesis in a general sense by describing the desired landscape pattern for the cool-moist and cold broad potential vegetation types. As stated in the final EIS in section 2.4.6, subsection "Apply information in Kosterman's 2014 thesis," and 3.7.5, subsection "Canada Lynx," although Kosterman's 2014 thesis provides valuable new information with the potential to inform changes in Forest Service management of lynx and lynx habitat, the relationships between vegetation composition and lynx reproductive success described in the thesis are not well enough understood to determine whether specific changes in NRLMD management direction are warranted or what they should be. Some of the analysis or findings in the original thesis may change prior to publication in a peer-reviewed publication. Also see the comments and responses under Canada Lynx—Supplemental EIS and Kosterman, Best Available Scientific Information—Wildlife Lynx Connectivity Management Area, and Canada Lynx—Draft EIS Analysis, Alternatives, and Standards.

The Griffin and Mills (2007) article is cited on page 445 of the draft EIS, and the Forest incorporated this and other science into its draft EIS discussion of VEG S5 exception 3.

The Forest used and cited several Squires publications that were published in peer-reviewed journals after 2002. Information in these publications was used to inform the Forest's plan components and to analyze effects in the draft EIS and the final EIS.

5. The NRLMD and forest plan have standards for connectivity (see appendix A), and these are applied at the project level based upon analysis of existing conditions and proposed activities. The Forest used Squires and others (2013) to identify and analyze travel corridors. This was clarified in section 3.7.5 of the final EIS. However, the Forest did not include a requirement that travel corridors have at least 60 percent canopy cover. A distinction needs to be made between lynx home range selection and modeled travel corridors. Squires and others (2013) discussed both and stated that connectivity is a function of movement between patches and the likelihood that patches are suitable for resident populations. Their model for putative travel corridors combined resource selection, step selection, and least-cost path models to define movement corridors for lynx and to create a broad-scale resource selection model that predicted probable lynx habitat across the species' distribution in the northern Rocky Mountains. Canopy cover greater than or equal to 60 percent was used to describe patches that contribute to a lynx home range but was not used to define putative travel corridors between patches.

Climate Change

Climate Change—Analysis and Science

Comment (letter numbers 73, 179, 201, 2601, 2865, 2869, 2904, 2994, 3028, 3295)

The Forest has not provided an adequate analysis in the draft EIS of the effects of climate change on plants and wildlife, and it should also incorporate the final Council on Environmental Quality guidance (August 1, 2016) when considering the effects of greenhouse gas emissions and climate change with implementation of the forest plan. The forest plan does not provide adequate direction for the protection of forests and habitat in the face of future climate change. The Forest should outline more clearly and definitively how forest management proposals will contribute or ameliorate anticipated climate change. A strategy and list of adaptation tools should be defined that will maintain ecological integrity into the future in the face of the changing climate.

The Forest should read and incorporate the journal article by Warner, Mass and Salathe (2015) titled "Changes in Winter Atmospheric Rivers along the North American West Coast in CMIP5 Climate Models." The upper Columbia River Basin will experience a marked increase in weird weather and extreme precipitation events. In particular, the Flathead will be susceptible to increased frequency and intensity of extreme Pacific atmospheric river events. Avoiding disruption to watersheds and implementing restoration activities in watersheds should be a high priority, such as through implementation of alternative C's recommended wilderness designations.

Response

The forest plan has adequately taken into account the potential impacts due to climate change, to the degree that programmatic plan components and management approaches can or should incorporate concepts related to the issue. Climate change is recognized as a potential stressor and is integrated into the discussion of affected environment and environmental consequences to

aquatic and terrestrial resources in the final EIS, such as soils (section 3.2.7), aquatic species and watersheds (sections 3.2.9, 3.2.12), vegetation and plants (section 3.3), and fire trends (section 3.8.3). Vegetation management and wildlife habitat direction in the forest plan addresses future uncertainties, such as climate change, by focusing on the development of landscapes and forest conditions that are resilient and resistant to disturbances and stressors (for example, see Trechsel, 2016 on development of vegetation desired conditions). Vegetative modeling incorporated future climate scenarios that reflected best estimates of climatic trends over the next five decades (Henderson, 2017; final EIS appendices 2 and 3). Appendix C of the plan suggests potential management approaches to address resilience. Appendix 7 of the final EIS provides a summary of the climate change adaptation strategies incorporated in the plan. Also, to clarify and respond to these public concerns, the documentation and analysis in the final EIS related to the subject of climate change and carbon sequestration has been expanded; refer to the carbon sequestration discussion in the final EIS (section 3.4) for additional information that addresses this issue.

The Forest reviewed the suggested article by Warner et al. (2015) and has added it to the references. The Forest agrees with the statement about anticipating larger fall rain events and has created the conservation watershed network partly in response to climate change and has also added the following desired condition and objective in anticipation of potential future changes in climate and rain events:

FW-DC-CWN-01: The Conservation Watershed Network has high-quality habitat and functionally intact ecosystems that are contributing to and enhancing the conservation and recovery of specific threatened or endangered fish species or aquatic species of conservation concern and provide high water quality and quantity. The watersheds contribute to the conservation and recovery of native fish and other aquatic species and help make habitat conditions more resilient to climate change.

FW-OBJ-CWN-01: The Conservation Watershed Network is the highest priority for restoration actions for native fish and other aquatic species. The stormproofing of 15 to 30 percent of the roads in the Conservation Watershed Network is prioritized, as funding allows, to benefit aquatic species (e.g., bull trout). See appendix C for specific strategies for treatment options and for prioritization, such as of roads paralleling streams vs. ridgetop roads.

Climate Change—Forest Management

Comment (letter numbers 12, 179, 233, 2615, 2821, 2842, 2904, 2996)

The Forest should actively manage its forests to counteract the effects of climate change. Forest management should include thinning and other harvesting methods to grow large trees, reduce fire hazard, maintain forest diversity and fully stocked stands that sequester carbon, and provide for clean air and water. The production of non-traditional products (such as forest biomass for fuels) should be supported, and the use of carbon credits to pay for forest management should be investigated.

The forest plan puts too much emphasis on traditional timber harvest and fire prevention rather than creating ecological resilience in the face of climate change. The plan should place more emphasis on maintaining fish and wildlife habitat, protecting old growth, protecting remaining wild areas, and implementing restoration activities in impacted watersheds, especially where roads vulnerable to failure are located.

Response

See also the comments and responses under Climate Change—Analysis and Science.

The desired conditions for vegetation composition, structure, and density are built upon the concept of maintaining and improving the resilience and resistance of the Forest, in part to address climate change and improve forest adaptability. Refer to the terrestrial vegetation section of the final EIS, particularly sections 3.3.2 and 3.3.9, for a discussion of the effects of the alternatives on forest resilience and for the management approach that the plan direction reflects for the purpose of promoting ecological sustainability in the face of future uncertainties, including climate change. Also refer to Trechsel (2016) for a discussion of the development of the vegetation desired conditions.

Objectives in the forest plan terrestrial vegetation section provide a range of acres that could be actively managed over the life of the plan to move towards achieving desired conditions for vegetation and other resources. Specific treatment prescriptions depend on many factors, such as stand conditions and location, and are appropriately determined at the site-specific level. Treatments are expected to employ a variety of silvicultural methods, including thinning for multiple purposes. Project-level analysis and site-specific conditions would determine which specific forest products might be available and feasible to produce. Desired conditions for other types of forest products, including fuelwood, is found in the Other Forest Products section of the plan, and the desired conditions address the opportunities and sustainable management of these products. The use of carbon credits to pay for forest management is not within the scope of this forest plan. At a broader, national scale, the Forest Service and its partners are exploring concepts and approaches associated with carbon credit (for more information, see the website https://www.fs.fed.us/ecosystems/services/Carbon_Capital_Fund/).

There is a relationship, as mentioned in the comments, between tree removals from a site (whether through logging or natural disturbances such as fire) and greenhouse gas emissions or sequestration and climate change. The Paris Protocol reference to forest reduction is concerned with deforestation at the global scale. Vegetation treatments (or natural disturbances, for that matter) on NFS lands are not deforestation but rather are a conversion of forests back to the early successional stage of development and the initiation of new forests through regeneration. The forests on the Flathead have been cycling through this natural succession process for millennia. The carbon sequestration section in the final EIS (section 3.4) has been expanded to provide more detailed information on existing conditions and potential effects related to carbon sequestration on the Flathead National Forest.

The responsible official considers all points of view in making his or her decision. The responsible official strives to provide for multiple uses and the proper management of all resources. As required by the 2012 planning rule, plan components are integrated, which means that desired conditions, standards, guidelines, objectives, and suitability all work together to contribute to desired ecological integrity, diversity of plant and animal communities, multiple-use management, and ecologically sustainable production of goods and services, and, as a whole, contribute to ecological, economic, and social sustainability. Plan components that address forest and vegetation conditions provide for fish and wildlife habitat. The plan provides for the conservation of old-growth forest with a number of plan components that address its maintenance, foster an increasing trend, and restrict management actions in old growth (i.e., FW-DC-TE&V-14, FW-STD-TE&V-01, and FW-GDL-TE&V-07). Under the preferred alternative, B modified, about 53 percent of the Flathead is designated wilderness or recommended wilderness and approximately 13 percent of the Forest is designated as backcountry (management areas 5a, 5b, 5c, 5d). This retains a substantial amount of area in a relatively undeveloped condition.

Climate Change—Grizzly Bear

Comment (letter numbers 108, 2807, 2888, 2940)

The Forest Service should provide a more thorough analysis of the impacts of climate change on grizzly bear habitat. The conclusions on the impacts of climate change on bear foods and the effects on the timing and duration of denning in relation to grizzly bear survival and recovery are not correct. The analysis does not comply with NEPA's "hard look" requirements.

Response

The final EIS for the Flathead's forest plan includes a section on future climate (section 3.1.2) that summarizes the best available scientific information for the Forest. The final EIS for the amendment forests and the cumulative effects for the NCDE as a whole address observed recent climate change (section 6.4) and projected future effects of climate change on grizzly bears and their habitat (section 6.5.5). The five-year status review for the grizzly bear (USFWS, 2011) assessed the potential effects of climate change on the grizzly bear, and the factors USFWS identified were presented and discussed in the draft EIS (volume 3, p. 91). The biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017) address bear foods, climate change, and available data on the timing of grizzly bear den emergence in detail. The Forest added discussion to the final EIS of research published by Roberts et al. (2014) on the projected changes in the distribution of 17 of the most commonly used plant foods in the Canadian Rockies as a result of climate change. These authors predicted an overall increase in availability and diet richness of bear foods through the coming century and concluded that the wide diet breadth of grizzly bears makes them less susceptible to changes in plant communities than other species such as polar bears. In the final EIS, the Forest attempted to more clearly explain and describe the potential effects of climate change and the degree of confidence with which predictions can be made for the NCDE area.

Some commenters stated that the Forest did not take a "hard look" at grizzly bears and climate change, referencing presentations they had attended regarding the impacts of a "berry famine" and the predicted summer climate in northwest Montana. Regarding the concern about berry famines, the Forest contacted Wayne Kasworm, who referenced the ongoing monitoring of the berry production of huckleberry, serviceberry, mountain ash, and buffaloberry shrubs in the Cabinet-Yaak ecosystem that started in 1989 (Kasworm et al., 2015). The average berry counts varied substantially between years, with huckleberry crops failing in 8 of the 26 years reported (see figure 30 on p. 62). Serviceberry and mountain ash may have provided significant secondary food sources in some years when the huckleberry crop failed (e.g., 2001 and 2003). The authors noted that climatic variables may influence berry production, with huckleberry production highest in years with cool spring and high July temperatures, and that future changes in climate may influence the availability of these grizzly bear foods. This information was added to the final EIS and discussed in the effects analysis. The Forest also contacted Stephen Running regarding the comment that stated that Running had projected the Flathead area's climate would become like the current climate of northern Utah. Running clarified that his statements about the future Montana climate were projections for the end of the century (Running, 2016). As described in section 6.5.4 of the final EIS, the analysis of indirect effects of the alternatives considers activities that may occur during the anticipated life of the plan, which is generally about 15 years after approval. The analysis of cumulative effects may extend beyond the life of the forest plan because factors such as climate change have the potential to affect wildlife habitat for long time periods. Predictions further into the future have an increasingly higher degree of uncertainty, and this is taken into account in the analysis and conclusions. Some commenters disagreed with the

characterization of the Servheen and Cross (2010) publication in the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013). The Forest would like to clarify that Servheen was one of the authors of the Conservation Strategy.

The Forest believes the analysis satisfies the “hard look” required under NEPA and that the forest plan and amendments have taken into account the potential impacts due to climate change to the degree that the impacts can be predicted and that Forest Service management reasonably can be expected to influence the outcome.

Draft Environmental Impact Statement

Draft EIS—Budget

Comment (letter numbers 38, 44, 2574, 2864)

The Forest needs to improve the section dealing with budgets, products, jobs, and labor income in the final EIS.

The Forest needs to disclose the total Forest budget so the public can understand the relative size of the timber budget (and other sectors of the budget).

The final EIS must include a broad range of reasonable alternatives that reflect clearly disclosed resource area subtotals of the Forest budget as well as the total Forest budget. This must be accompanied by a clear description of where the total Forest budget or various subdivisions of that budget are capped or otherwise determined by the 2012 planning rule, in language that a layperson can understand. In other words, fully display how various sections of the Forest budget could be adjusted to increase or decrease emphasis on various Forest programs under a broad range of alternatives.

Issues such as budget and capacity constraints and site-specific regulation and restriction should be considered at the project level, not the plan level. The reason for this distinction is that budgets, management direction, policy, and restrictions change on a regular basis, whereas the needs of the land and society are not as subject to the whims of politics and regulation.

Response

Budget constraints for timber sale activities are considered across the alternatives and described in appendix 2 (see p. 2-20 and table 2-15 in appendix 2 of the final EIS). The Forest’s budget was included in the analysis of jobs and income under each alternative in the Social and Economic Environment section of the final EIS, volume 2, section 3.27.4, subsection “Income and jobs.”

Forest plans do not make budget decisions. Should Congress emphasize specific programs by appropriation, a redistribution of priorities would follow, regardless of the alternative implemented.

As required by the 2012 planning rule (36 CFR 219.1(g)), the responsible official must ensure that plan components are within the fiscal capability of the planning unit. Fiscal capability was considered in developing the objectives and monitoring requirements, based on reasonably foreseeable budgets. As stated on page 4 of the forest plan: “It is important to recognize that objectives were developed considering historic and expected budget allocations, as well as professional experience with implementing various resource programs and activities. It is possible that objectives could either exceed or not meet a target based upon a number of factors including

budget and staffing increases or decreases, increased or decreased planning efficiencies, and unanticipated resource constraints.” Thus, the attainment of objectives is dependent on actual budgets received in the future.

Draft EIS—Coarse- and Fine-Filter Analysis

Comment (letter numbers 2875, 2940)

Coarse-filter vegetation characteristics may play a useful role in managing for many at-risk wildlife species; the process used to develop these plan components is generally good.

The Forest should include an explanation of the predictive value of the key ecosystem characteristics for individual species. It is important that the relationship between species and ecosystem characteristics is established by the best available scientific information and that uncertainties be recognized, disclosed, and addressed by species-specific plan components where needed for additional assurance of viability.

A combined coarse-filter/fine-filter (species-specific) approach would be the appropriate means of addressing both structural and functional connectivity in the Flathead National Forest region. The analysis in the draft EIS should be improved because it only considered connectivity of forested cover types, and although forest is the dominant cover type on Flathead National Forest lands, other cover types also serve as wildlife habitat, are important for connectivity, and should be considered in the final EIS.

Response

The affected environment discussion for each section of the wildlife analysis establishes the relationship between species and key ecosystem characteristics based upon the best available scientific information, including literature citations as well as other planning record documents cited in the references section. The body of science described for each species or ecosystem is the basis for coarse-filter and fine-filter (species-specific) plan components. Section 3.7.3 of the final EIS discusses uncertainties, incomplete and unavailable information, and the use of models, maps, and data in general. These topics are also discussed in the sections on individual wildlife species.

Section 3.7.6 was added to the final EIS to summarize and clarify how the plan addresses structural and functional connectivity. Plan components for connectivity and the analysis of effects of alternatives on connectivity did not just consider forested cover types. For example, the connectivity of grass, forb, and shrub habitats is discussed in section 3.7.4, subsection “persistent grass/forb/shrub habitats,” of the final EIS. Desired conditions listed in the section on geographic areas in the plan identify connectivity areas across valley-bottom areas for multiple species. The forest plan includes guideline FW-GDL-IFS-13, which addresses connectivity across areas of highway disturbance for a wide range of species based upon Ament et al. (2014). Ament and others identified priority areas considering scientific information for Canada lynx, wolverine, grizzly bear, black bear, and information from MFWP’s forest generalist corridor model. Standards and guidelines for riparian management zones contribute to structural connectivity by limiting roads and maintaining cover as well as habitat diversity. The map of riparian management zones in the final EIS shows that the distribution of riparian management zones contributes to connectivity in all action alternatives, and this is discussed in section 3.7.4 of the final EIS, subsection “Aquatic, wetland, and riparian habitats.”

The coarse-filter approach used in the forest plan identifies broad areas expected to support the movement of a wide range of species as well as the continuity of ecological processes, using information on general landscape properties such as degree of human modification or cover type. The plan contains coarse-filter plan components that provide for wildlife diversity as well as species-specific plan components for species such as the grizzly bear, Canada lynx, black swift, Clark's nutcracker, fisher, flammulated owl, harlequin duck, common loon, bald eagle, elk, deer, mountain goat, gray wolf, wolverine, peregrine falcon, northern goshawk, and great blue heron. Species-specific connectivity models for selected species are referenced in section 3.7.6 of the final EIS and are used to establish finer-scale priorities for connectivity management.

Numerous sections of the final EIS discuss scientific information on within-home-range movements as well as dispersal. The final EIS discusses functional connectivity for individual species and explains how the network of Forest management areas that maintain low densities of roads and development, such as wilderness, recommended wilderness, and backcountry would provide for connectivity by alternative. Additional discussion of how management areas contribute to connectivity has been added to the wolverine section of the final EIS. Section 3.7.5 of the final EIS on the grizzly bear discusses the effects of the Forest's alternatives on grizzly bear habitat connectivity as well as genetic connectivity. Section 6.5.5 of the final EIS discusses the effects of the alternatives on grizzly bear habitat connectivity and genetic connectivity at the large scale of the NCDE and includes a discussion of modeled habitat permeability at the landscape scale. The final EIS sections on grizzly bear habitat security and final EIS figures depict the spatial distribution of security core or secure core, consider the influence zone of roads, and show how this habitat provides connectivity. Standards for the grizzly bear limit the amount and distribution of NFS roads, thus indirectly contributing to habitat connectivity for other species that are sensitive to motorized disturbance or the indirect effects of roads. Section 3.7.5, subsection "Canada lynx," discusses how standards for vegetation management (VEG S1, S2, S5, and S6) limit the amount of habitat that can be regenerated in each lynx analysis unit while ALL S1 and LINK S1 require that new or expanded permanent development and vegetation management projects must maintain lynx habitat connectivity in a lynx analysis unit and/or linkage area, thus contributing to habitat connectivity for Canada lynx and their critical habitat.

In summary, the forest plan includes multiple coarse-filter and fine-filter plan components to support wildlife habitat connectivity, diversity, and persistence of species. Also see comments and responses under Grizzly Bear—Habitat Connectivity, Wildlife—Modeling and Managing Connectivity, Grizzly Bear Conservation Strategy—Connectivity, and Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest.

Draft EIS—General

Comment (letter numbers 1, 38, 44, 51, 153, 290, 2574, 2864, 2888, 2091, 2940, 2994, 3013, 3076, 3079)

The Forest should include a better summary of the comparison of alternatives.

The Forest should include a summary of the costs of the planning process.

The Forest should have specialists' reports that support the analysis in the EIS.

The Forest plan should be more descriptive rather than prescriptive. The plan should be a guiding document and not be so constraining as to provide yet another basis for litigation.

The forest plan should include standards that are measurable and quantifiable; without additional standards, the plan is meaningless and lacks accountability.

The Forest should (1) include an alternative to address local government needs, (2) conduct cumulative impact analysis, (3) review consistency with local growth policy, (4) coordinate with local governments, and (5) pay special attention to the economic and social needs of low-income and minority communities in the draft EIS.

Response

The final EIS includes a comparison of revision topics by alternative (section 2.7).

The cost of revising the Flathead National Forest's forest plan and amending the four NCDE forest plans for grizzly bear recovery has been approximately \$800,000 per year since 2012.

The analysis conducted by resource specialists was written specifically to meet the requirements of an EIS. Separate specialists' reports were not written, nor are they required under the Council on Environmental Quality regulations for conducting NEPA analyses.

The forest plan reflects the degree of structure the responsible official decided was appropriate for various aspects of the rule. The goal in revising the plan was to create an implementable framework for planning along with a structure and set of requirements and other plan content that would support the ecological, social, and economic sustainability objectives in the plan area. The plan is designed to be flexible to reflect the different unique circumstances across the planning area, especially when analyzing site-specific needs. The plan was developed considering the best available scientific information, public input, and information about expected changing conditions at the unit level. All of the standards and guidelines have been carefully considered for the forest plan, and the assortment of these important plan components provides important and accountable guidance to the Forest in its progress towards and achievement of the desired conditions.

The draft EIS included a range of alternatives that address local government needs. For example, Flathead County comments on the draft EIS specifically requested that no additional areas be recommended for wilderness designation. Alternative D was developed to address this comment as well as other commenters' concerns. A consistency review was conducted of Missoula and Flathead Counties' growth policies. The results of this review were documented in section 1.6.1 of the draft EIS. Coordination with local county governments has been an ongoing process throughout the development of this forest plan. This coordination occurred through regularly scheduled interagency meetings since the beginning of the planning process (planning record exhibits 00004-00021, 00307-00314; also available at <http://www.merid.org/FNFplanrevision.aspx>). The final EIS (section 3.26.7) included information specifically addressing the plan's effects on the needs of low-income and minority communities.

Draft EIS—Purpose and Need

Comment (letter numbers 51, 2765)

The Forest needs to disclose the changed conditions and demands that have occurred since the Flathead's 1986 forest plan if the purpose and need of the draft EIS is to address significant changes that have occurred, supported by monitoring data from the existing plan.

The Forest should support motorized recreation because it is the best way to support diversity of uses and the Forest Service's multiple-use mandate.

Response

The requirements of the 2012 planning rule, findings from the Flathead's 2014 assessment, changes in conditions and demands since the 1986 forest plan, and public concerns to date have highlighted several areas where changes are needed to the current plan, necessitating a plan revision.

To develop a proposed action that makes changes to a forest plan, the management direction in the current plan and its amendments is reviewed. Effective management direction from the current plan may be retained, or it may be modified or augmented by incorporating relevant new scientific information or direction from other regulatory documents. The 2012 planning rule requirements also mandate that new management direction be developed to address sustainability.

The Forest recognizes that there are many different ideas and opinions on how the Forest should be managed and how the mix of multiple uses of the Forest should be applied across the landscape. The EIS considered a broad range of alternatives that emphasized different mixes of uses, such as one that included more backcountry and recommended wilderness areas (alternative C) and one that included more lands that are suitable for higher levels of timber production (alternative D). All alternatives recognized that vegetation management, including timber harvest, is an important tool to help achieve forest plan desired conditions, including ecological (i.e., wildlife habitat, forest resilience) and social and economic (i.e., providing wood products and employment). The responsible official considered all points of view and the desire to provide for multiple uses of the Forest in identifying alternative B modified as the preferred alternative.

There are numerous desired conditions related to motorized recreation, including FW-DC-IFS-08: "The Forest's trail system provides a variety of high-quality motorized and nonmotorized recreational opportunities during summer and winter. Forest system trails access destinations, provide for loop opportunities that connect to a larger trail system, provide linkage from local communities to the Forest, and are compatible with other resources."

The following objectives are related to motorized and mountain bike opportunities: GA-SM-OBJ-01, GA-NF-OBJ-02, and GA-SV-MA7-Crane-OBJ-01. Section 3.10 on sustainable recreation in the final EIS addresses motorized recreation.

It is important to realize that motorized access opportunities are and will be constrained by management requirements that are necessary to ensure habitat conditions continue to contribute to sustaining the grizzly bear population in the NCDE. Changing motorized access significantly, as suggested by the commenter, is incompatible with the need to maintain baseline access conditions (see glossary).

Fire

Fire—Desired Conditions

Comment (letter numbers 217, 2574, 2940, 3085, 3122)

The Forest Service should clarify the intent of the "all lands approach" and take into account that neighbors may have different objectives regarding fire.

The Flathead should translate the range of “intensity, severity and frequency” of fires in FW-DC-FIRE-04 into desired vegetation conditions that are conducive to those fire conditions.

Response

Desired condition FW-DC-FIRE-05 was rewritten to address the concern regarding neighbors’ objectives and fire on private lands. The desired conditions for fire outlined in FW-DC-FIRE-04 are closely related and integrated into the desired conditions related to vegetation conditions across the Forest. The overall desire is for vegetation conditions to contribute to forest conditions that are resistant and/or resilient to potential future disturbances such as fire (FW-DC-TE&V-03). Plan components related to vegetation composition, structure, and pattern are based on the concept of managing within the natural range of variation and maintaining or enhancing forest resilience. In other words, the assumption and expectation is that by managing vegetation according to the direction within the forest plan, ecosystem functions—including the role and characteristics of fire—would be within the range of natural variation and would maintain ecosystem sustainability.

Fire—Prescribed Fire

Comment (letter numbers 36, 58, 2649, 2989, 2998)

The Forest Service should increase the use of prescribed fire. The timing of spring prescribed fires should consider impacts to newborn animals and birds.

The Forest should include regular prescribed fire in wilderness as part of its management.

Response

The Forest considers wildlife in the timing and intensity of its prescribed fires and times burning to occur in the fall in some cases. The Forest’s goal is to benefit wildlife and other resources with prescribed fires and to minimize negative impacts. The Forest acknowledges that prescribed fires may adversely impact individual animals and birds on occasion, but these effects are generally not to populations. Prescribed burning may lessen the negative impacts of stand-replacing wildfire for some wildlife species as well as provide desired habitat conditions.

Prescribed fire in wilderness is permitted by policy in Forest Service Manual 2324. The Forest Service Manual describes the situations in the wilderness where prescribed burning can occur. The Forest has recently successfully implemented prescribed fire in the Mission Mountains Wilderness. The forest plan supports the use of fire across the Forest, including potentially within wilderness. For example, retaining and/or promoting whitebark pine habitat is noted in the plan (FW-DC-PLANT-03), with associated objectives of treating 8,000 to 19,000 acres over the life of the plan (FW-OBJ-PLANT-01). Prescribed burning is expected to be one component of the whitebark pine restoration program as well as a tool that would be used to achieve other ecological and social purposes (FW-DC-TE&V-23 and FW-DC-FIRE-03).

Fire—Public Education

Comment (letter number 58)

The Flathead should consider increasing the use of signs such as “You are required to carry axe, bucket, and shovel” to educate the public on their responsibility to put dead out any fires they create.

Response

Fire prevention activities are planned to best educate the public. Your comment will be passed on to the ranger districts on the Forest for consideration in their annual communication activities.

Fire—Silviculture

Comment (letter numbers 1, 272, 3077, 3093, 3115)

The Forest should utilize timber harvest opportunities to create and maintain fuel breaks to assist in fire suppression operations and to allow low-threat fires to burn under low-threat conditions.

The Forest should use timber harvest more than prescribed burning to manage the Forest's timber.

Response

A new desired condition, FW-DC-FIRE-07, addresses the use of “shaded fuel breaks” to facilitate fire response operations.

Generally, controlled burns are not designed to manage “timber,” as in the forest overstory, but to manage the understory ground and ladder vegetation that contribute to fire spread. Stand-replacement prescribed fire is usually the intent in locations where forest openings and young, early successional forest conditions are desired and timber harvest is impractical. Many prescribed fires are focused on providing other resource benefits, such as reducing timber encroachment into meadows and grass/shrub lands.

Fire—Standards, Guidelines, Objectives

Comment (letter numbers 2574, 2940)

The Forest should identify areas that are the focus for active fuels management.

The Forest should explain the risk assessment process further in appendix B.

Response

As currently defined, hazardous fuels treatments are conducted within the wildland-urban interface. Under alternative B modified, approximately 70 percent of the wildland-urban interface is designated as general forest management area 6a, 6b, or 6c, and the focus on hazardous fuel treatments would occur where the values at risk are of high concern. Specific areas for treatment would be identified at the project level of analysis. Treatments may have multiple activities to meet project objectives, which may or may not include replicating fire and its ecological role. Other plan components are taken into account in the project-level analysis.

Appendix C has been enhanced to clarify the risk assessment process, timelines, and neighboring landowner objectives.

Fire—Suppression

Comment (letter numbers 2938, 2940, 3010, 3122)

The Forest Service should not obliterate or decommission roads that are critical for access when responding to wildfire or other emergencies.

The Forest should consider alternatives to the “continued policy of heavy fire suppression” within the wildland-urban interface (draft EIS, p. 209), and should identify areas that emphasize fire suppression during, as opposed to outside, the forest planning process.

Response

The Forest’s environmentally and fiscally sustainable minimum road system was assessed in the travel analysis report for the Flathead National Forest (USDA, 2014c), which considered roads that are critical for access. The travel analysis report was used to inform plan components. Alternative B modified provides guidance on decommissioning 50-60 miles of roads (see objectives FW-OBJ-IFS-01 and GA-SV-OBJ-04). Additionally, these roads will likely be on recently acquired lands where road density is a concern in relation to many issues. In the Swan Valley, it is expected that 10-30 miles may be decommissioned; these are primarily on Montana Legacy Project lands acquired from Plum Creek.

Plan components have been added to more directly address concerns related to fire spreading to properties adjacent to the Forest (FW-DC-FIRE-05 and FW-GDL-FIRE-06). Fire management strategies would be designed to prevent the spread of wildland fires to neighboring properties and to suppress fires that threaten neighboring properties and resources. These components are the same under all action alternatives. Wildland fires within wildland-urban interface areas would be expected to be of most concern and to be where this direction would most often apply, compared to areas outside the wildland-urban interface. Fire suppression in general is based upon the source of ignition, values at risk, fire conditions (fuels, weather, season etc.), and expected fire behavior, as well as plan objectives. See appendix C for further discussion of approaches to fire management.

Fire—Use and Plan Components

Comment (letter number 2940)

The EIS analysis and the plan components should be more explicit on plan direction that supports and recognizes the role of fire on the Forest, including the role of high-severity fire, because it is a natural process in this ecosystem.

Response

The forest plan contains several desired conditions and other plan components that recognize and support the role that fire has in the ecosystems of the Flathead (FW-DC-TE&V-03; FS-DC-TE&V-18 and 19; FW-DC-TE&V-23, 24, and 25; FW-DC-FIRE-03 and 04; FS-GDL-FIRE-02). The analyses in the terrestrial vegetation and the fire and fuels sections of the final EIS (sections 3.3 and 3.8) discuss fire’s role in the ecosystem, the natural range of variation, the use of fire as a tool to change vegetation for maintaining and moving towards desired conditions, and the estimated amount of fire in the future and its potential influence on vegetation conditions. Also see the comments and responses under Wildlife—Black-Backed Woodpecker, which is a species associated with moderate- to high-severity fire.

Fire—Wildand-Urban Interface

Comment (letter numbers 2601, 2984)

The Forest should remap the wildland-urban interface utilizing other criteria.

Response

The wildland-urban interface (see the glossary and figure 1-13 in appendix 1 of the final EIS) is based upon locally produced community wildfire protection plans, as stipulated and defined in the Healthy Forests Restoration Act of 2003. The Forest Service is not part of the core team that develops the community wildfire protection plans or that creates the maps of the wildland-urban interface.

The language in the Healthy Forests Restoration Act provides maximum flexibility to communities in terms of the substance and detail of their plans and the procedures they use to develop them. The core team that develops these community wildfire protection plans include representatives from the appropriate local governments, local fire authority, and State agency responsible for forest management, in consultation with Federal agencies and other interested parties. The community wildfire protection plans are revised periodically, and public input to plan development is encouraged.

The structure ignition zone largely occurs on private lands and is the responsibility of the property owner (Reinhardt, Keane, Calkin, & Cohen, 2008).

Forest Management—General

Comment (letter numbers 19, 36, 61, 2796, 2805, 2842, 2989, 3012, 3016, 3024, 3025, 3290, 3296)

Management should occur in a balanced way that benefits all resources equally (vegetation, wildlife, recreation, water) and that incorporates an active management approach (e.g., timber harvest), but it should be used in a responsible, careful way.

The Forest should take a hands-off approach, allowing natural processes (succession, fire) to play a larger role.

The Forest should accelerate timber harvest to meet the need for a sustainable source of wood products and local employment.

Response

The Forest recognizes that there are many different ideas and opinions concerning how the Forest should be managed and how the multiple uses of the Forest should be applied across the landscape. The EIS considered a broad range of alternatives that emphasized different multiple uses, such as one that included more backcountry and recommended wilderness areas (alternative C) and one that included more lands that are suitable for higher levels of timber production (alternative D). All alternatives recognized that vegetation management, including timber harvest, is an important tool to help achieve the desired conditions in the forest plan, including ecological (i.e., wildlife habitat, forest resilience) and social and economic (i.e., providing wood products and employment). The responsible official considers all points of view in making his or her decision, with the intent of providing for an assortment of multiple uses of the Flathead National Forest.

Forest Plan

Forest Plan—Glossary Edits

Comment (letter number 217)

The Forest should add additional terms to the glossary.

Response

Thank you for your suggested additions to the glossary. The Forest has added additional terms to the glossary. The terms defined in the glossary are compiled while the documents are being written. Terms that are described in the body of the text, such as Wild and Scenic River outstandingly remarkable values, do not necessarily need to be defined in the glossary.

Forestwide Standards—General**Comment** (letter number 2765)

The Forest did not adequately explain why standards were dropped; existing standards are those required by law under the 1982 planning rule.

Response

As stated in the final EIS, section 1.4, Purpose and Need for Action, “The requirements of the 2012 planning rule, findings of the assessment, changes in conditions and demands since the 1986 forest plan, and public concerns to date highlighted several areas where changes are needed to the current plan, necessitating a plan revision.”

To develop a proposed action that makes changes to a forest plan, the management direction in the current plan and its amendments are reviewed. Effective management direction from the current plan may be retained, or it may be modified or augmented by incorporating relevant new scientific information or direction from other regulatory documents. The 2012 planning rule requirements also mandate that new management direction be developed (e.g., to address sustainability).

Forest Products**Forest Products—Benefits of Wood Products**

Comment (letter numbers 56, 58, 193, 319, 2574, 2588, 2840, 2938, 2995, 2999, 3076, 3080, 3081, 3099, 3122, 3257)

Providing wood products is a valid and valuable product of forest management and is important for reducing fire hazard and improving forest health while protecting other resource values. It is important to provide timber to local mills and other local forest products businesses.

Response

The forest plan recognizes the importance of wood products and timber harvest in reducing fire hazard and improving forest health. See the timber desired conditions FW-DC-TIMB-01 and 03 in the forest plan. The importance of wood products and timber harvest in providing timber, jobs, and income to local economies is also recognized (FW-DC-TIMB-01 and 02).

An analysis was completed to determine the sustainable level of timber harvest in response to desired conditions and management requirements. The results are outlined in the EIS and forest plan as the projected timber sale quantity and the projected wood sale quantity. The projected timber sale quantity is the amount of sawtimber that meets utilization standards, whereas the projected wood sale quantity includes all forest products, including posts and poles. Refer to the timber section of the forest plan for the objectives for projected timber sale quantity, projected wood sale quantity, and other direction associated with the production of timber outputs. Sale of

stumpage will continue to contribute to the viability of the forest products infrastructure. Section 3.27, the social and economic environment section of the final EIS, highlights the importance of forest outputs on local economies and communities within the analysis area.

The preferred alternative, B modified, reflects the desire for a timber harvest level that provides local jobs and income and generates products for local mills and other forest products businesses to improve forest health within organizational capacity and reasonably foreseeable budgets and while protecting wildlife and other resource values.

Forest Products—Biomass Products

Comment (letter number 2765)

The Forest should not support the proliferation of commercial biomass production. The use of forest biomass for heating or power generation should not be included in the forest plan and EIS.

Response

The forest plan does not discuss or propose the commercial production of biomass for heating or power generation. This is outside the scope of the forest plan.

Forest Products—Budget

Comment (letter numbers 38, 2864)

The timber budget figures discussed for the timber modeling are unclear and confusing. As stated in the timber analysis, the timber budget for all alternatives is limited to \$4.1 million per year as the current and/or reasonably foreseeable budget (draft EIS, appendix 2, p. 2-25). Because of “low timber harvest levels, alternative C does not require the entire current budget level; rather, it is 2.2 million dollars below current levels” (draft EIS, vol. 2, p. 115). In appendix 2 (p. 2-25), however, the difference between \$4.1 million and the \$2.8 million timber budget for alternative C is \$1.3 million, not \$2.2 million, as stated in the draft EIS. Why don’t these figures match?

Response

Thank you for identifying a typo in the draft EIS. The “2.2 million dollars” on p. 115 should have been “1.2 million dollars.” The current budget level is \$4.051 million, which was rounded to 4.1 million in table 2-15 on page 2-25. The first decade budget under the unconstrained budget run for alternative C was \$2.806 million dollars (rounded to 2.8 million in table 2-15). The difference in these two figures is \$1.245 million, which rounds to \$1.2 million. This figure has been corrected in the final EIS.

Forest Products—Firewood

Comment (letter numbers 91, 108, 225, 2949, 3025)

The Forest should provide additional access and opportunities for firewood cutting.

The Forest should not allow temporary motorized road access for activities such as firewood gathering under Alternative C, as is provided for by standard FW-STD-IFS-04

Response

The forest plan recognizes the importance of providing opportunities for firewood cutting. See the desired conditions in the terrestrial vegetation and other forest products sections in the plan (FW-DC-TE&V-05 and FW-DC-OFP-01 and 03).

As described in the final EIS, restrictions on the use of wheeled motorized vehicles on roads and trails would occur under all alternatives because of management considerations related to other resources, including wildlife and water. The preferred alternative, B modified, would result in minor changes from current conditions for wheeled motorized use and would have little to no effect on the area currently potentially accessible by motorized wheeled vehicles for gathering firewood.

Thank you for expressing your views on access for firewood cutting under alternative C. Occasionally, managers might open existing closed roads in specific areas for a short period for firewood cutting, which would be evaluated on a site-specific basis. All the action alternatives include a standard (FW-STD-IFS-04) that states that a restricted road may be temporarily opened for public motorized use to allow authorized uses (such as firewood gathering). This standard provides access for firewood gathering while protecting grizzly bears and other wildlife. The period of use of the temporarily opened road must not exceed 30 consecutive days during one non-denning season; it must occur outside of spring and fall bear hunting seasons; and public use shall not be authorized in secure core (see glossary). In addition, prior to temporarily opening up a road to provide public access for gathering firewood, measures to protect the most valuable snags for wildlife habitat are required (FW-GDL-OFP-01). Not allowing this type of temporary use of road for firewood gathering was considered by the decisionmaker in making the decision on the preferred alternative. The preferred alternative B modified includes the standard.

Forest Products—General

Comment (letter numbers 156, 3027, 3099, 3257)

The Forest should consider the following regarding forest products:

- There should be no clearcutting on the Forest.
- Areas that will be managed for timber harvest or production should not exclude recreation except when necessary for safety reasons.
- There needs to be responsible timber management in the Coram Experimental Forest and the Hungry Lion planning area.

Response

Clearcutting is a silvicultural tool for vegetation management. Clearcutting is allowed on the Forest and will be used where appropriate, as determined through site-specific project analysis. Forest plan direction recognizes the important role that very large live trees have in the ecosystem, and a guideline addresses retention of larger-diameter western larch or ponderosa pine leave trees within clearcuts and other even-aged regeneration harvest units (FW-GDL-TE&V-09). If these particular species or size class is not present, then alternative reserve trees should be considered. The clearcut harvest method is not allowed within riparian management zones (FW-GDL-RMZ-08). In these areas, live reserve trees are required to be left when conducting any tree harvest activities, with trees of any species, size, or condition acceptable as reserve trees.

No plan direction excludes recreation opportunities because of timber management. Any reduction in recreation opportunities within lands managed for timber is because of other resource concerns and not because of timber harvest or production.

The Coram Experimental Forest is in management area 4b under all the alternatives. Although this management area is not suitable for timber production, timber harvest is allowed for salvage logging, for research purposes, and to achieve desired vegetation conditions, as mutually agreed upon by the Rocky Mountain Research Station and the Forest (see the section on management area 4b in the forest plan). Timber harvest within the Hungry Lion planning area is decided at the project level and is not a decision made in the forest plan.

Forest Products—Logging Preferences

Comment (letter numbers 5, 12, 27, 135, 312, 331, 2576, 2622, 2917, 3097, 3263, 3271)

The Forest Service should do more timber management on the Flathead National Forest.

The Forest Service should do less or no timber management or should limit timber harvest to areas previously logged.

Response

Under the action alternatives, timber harvest is a tool for moving vegetation towards desired conditions while contributing to social and economic sustainability. The levels of timber harvest displayed for alternatives B modified, C, and D reflect these goals. Timber harvest is an allowed use on the Forest and will be used to move the Forest towards desired conditions, consistent with management area, geographic area, and forestwide plan components. Logging is not limited to previously logged areas but will follow resource management considerations and management area direction.

An analysis was completed to determine the sustainable level of timber harvest in response to desired conditions and management requirements. The results are outlined in the EIS (see section 3.21 and appendix 2 of the final EIS). The preferred alternative, B modified, reflects a timber harvest level that is sustainable and that contributes to desired conditions.

Forest Products—Other Products

Comment (letter numbers 108, 3009)

The Forest should provide more direction on the harvest of forest products other than timber, particularly huckleberries and mushrooms. The analysis of effects to long-term productivity from mushroom picking is a concern that should be addressed.

Response

Forestwide desired conditions FW-DC-TE&V-05 and FW-DC-OFP-01 through 04 address opportunities and vegetation conditions that provide sustainable levels of other forest products. Standard FW-STD-OFP-01 and guideline FW-GDL-OFP-01 are provided to address potential conflicts with grizzly bears and the effects of the removal of other forest products on snag-associated wildlife species. The suitability of different areas for commercial and personal-use gathering of other forest products is described under the Suitability headings in chapter 3 of the forest plan. In regards to the potential damage to morels from mushroom picking, refer to section

3.22 of the final EIS, where additional analysis was added to address this concern. Mushroom picking as it occurs on the Forest would have no adverse impact on mushroom productivity.

Forest Products—Plan Components

Comment (letter numbers 108, 2574, 3122)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

The Forest should consider the following regarding the desired conditions, standards, guidelines, and objectives related to forest products:

1. The projected timber sale quantity in FW-OBJ-TIMB-01 should not be limited by current budget levels. The objective should be changed as follows: The long-term sustained yield limit of 25.4 million cubic feet represents the upper bound of timber harvest on the forest. Current and predicted budgets allow for an annual projected timber sale quantity of 29.2 million board feet. Desired future conditions indicate a pace and scale of between X,XXX and X,XXX acres per year of treatment. As budgets allow, projected timber sale quantity should exceed the current 29.2 million board feet but not exceed the sustained yield limit, with the goal of reaching desired future conditions at an appropriate pace and scale, as dictated by budget and capacity.

2. Standard FW-STD-TIMB-07 is too subjective and lacking in rigor and should be rewritten to direct the project team to provide additional alternatives and analyses when considering openings larger than 40 acres.

Standard FW-STD-TIMB-07 is important for achieving desired conditions and should be considered in every project; larger opening sizes in the suitable timber base is the only way to achieve FW-DC-TE&V-16 patch size.

3. Desired condition FW-DC-TIMB-07 is repetitive with the desired conditions and objectives in the Soils section.

4. Standard FW-STD-OFP 01 is duplicative with FW-STD-LSU-01.

Response

1. As stated on page 4 of the draft forest plan, objectives were developed using reasonably foreseeable budgets: “It is important to recognize that objectives were developed considering historic and expected budget allocations, as well as professional experience with implementing various resource programs and activities. It is possible that objectives could either exceed or not meet a target based upon a number of factors including budget and staffing increases/decreases, increased/decreased planning efficiencies, and unanticipated resource constraints.” Thus, objectives may be exceeded or not met based on actual budget and staffing or other unforeseen changes. The objectives related to commercial timber harvest volume for alternative B modified (the preferred alternative) in the forest plan are essentially the same as for alternative B in the draft EIS. Appendix C of the forest plan describes the potential for additional timber harvest given higher budget levels and in response to moving towards desired conditions.

2. Northern Region Supplement 2400-2016-1 of the Forest Service Manual 2470-Silvicultural Practices was recently approved (Nov. 21, 2016), and it incorporates the direction of the 2012 planning rule for harvest opening size and requirements for public review, which are reflected in

standards FW-STD-TIMB-07, 08, and 09 in the forest plan. The maximum harvest opening size in the standard is based upon an analysis of the natural range of variation in openings created by stand-replacement fire as well as other ecological, social, and economic factors. This analysis is documented in Trechsel (2017c). The standard is designed to provide the flexibility necessary to help achieve desired ecological conditions for the Forest, as required by the planning rule. The particular conditions that would likely be most influential at the project level when considering the size of harvest openings are connected to resource conditions or direction related to other forest plan components, which are referenced rather than repeated within the standard. Analysis and documentation of pattern and size of openings, effects to multiple resources, and project consistency with this standard would occur at the site-specific project level, with opportunities for public review and comment. Final approval would be by the project-level deciding officer.

3. The Forest agrees, and this desired condition has been removed from the Timber section in the forest plan.

4. The Forest agrees, and this standard has been removed from the Lands and Special Uses section in the forest plan.

Forest Products—Salvage

Comment (letter numbers 108, 2904, 2940, 3010, 3021)

The draft EIS analysis of the effects of salvage logging is inadequate and does not provide the scientific support for the assumptions that salvage harvest can help meet desired conditions or achieve ecological integrity or prevent insect infestations. The draft EIS does not look at effects to species other than birds. Studies show that salvage harvest undermines ecological integrity and ecosystem resilience. The potential extent where salvage may occur in the future should be restricted by sustained yield limit. The Forest Service should provide clear direction on where salvage harvest may or may not be appropriate, such as for public safety or for critical infrastructure. There should be limitations or prohibitions on salvage harvest in areas that meet desired conditions or fall within the natural range of variation for disturbances. The snag and downed wood desired conditions may not be strong enough to sustain the wildlife dependent on them. The forest plan would allow salvage harvest decisions to be made on an arbitrary basis.

The forest plan and draft EIS assume that salvaging timber from burned and insect-affected areas can help achieve desired vegetation and ecosystem conditions on the Forest. Salvage logging is not a purpose but a management activity. The Forest should clarify what the ecological purpose of salvage harvest is.

The Forest should include an alternative that removes the dead and dying forest fuels and provides timely salvage and utilization of needed forest products from the Swan Valley area, particularly along the faces of the Swan and Mission mountain ranges.

Response

The final EIS contains additional documentation, analysis, and clarification in section 3.3.7; section 3.7.4., subsection “Old-growth forests, very large live habitat, and very large dead tree habitat”; and section 3.21. These help to address the points regarding salvage harvest in the comments under this area of concern. In addition, Forest plan components in the timber section of the plan have also been edited to clarify the direction regarding salvage harvesting (FW-DC-TIMB-05 and 06).

The Flathead National Forest's forest plan reflects the direction in the National Forest Management Act and the 2012 planning rule regarding salvage and sanitation harvest and allows this activity to occur on lands suited for timber production as well as some of the lands not suited for timber production. As stated in the planning rule (Forest Service Handbook 1909.12 chap. 60 sec. 64.1), the National Forest Management Act directs that "the Secretary shall assure that except for salvage sales or sales necessitated to protect other multiple-use values, no timber harvesting shall occur on such lands [lands not suited for timber production] for a period of 10 years (USC 1604(k))."

Although no timber harvest for the purpose of timber production may occur on lands not suited for timber production, forest plans "may have components that allow timber harvest on lands not suited for timber production to protect other multiple-use values, and for salvage, sanitation, public health, or safety" (Forest Service Handbook 1909.12 chap. 60 sec. 64.1). Also, the National Forest Management Act provides for the removal of timber in salvage or sanitation harvests at a level that may exceed the sustained yield limit for the Forest (16 U.S.C. 1611 and Forest Service Handbook 1909.12 chap. 60 sec. 64.3).

The standards that limit timber harvest activities in the Forest Vegetation Products: Timber section of the plan would apply to any type of harvest activity, such as salvage in burned forests or treatments in "green" stands. Among other things, the standards and guidelines address limitations related to harvest that are set forth in the National Forest Management Act (36 CFR 219.11(d)(1)-(7)) for purposes such as protecting soil productivity, ensuring that restocking of trees occurs, and using the clearcutting method only where it is determined to be the optimum method. The sustained yield limit standard (FW-STD-TIMB-05) is the only quantitative limitation on timber product outputs in the forest plan. The objectives (FW-OBJ-TIMB-01 and 02) state the expected timber outputs, but these outputs may change based on budget levels.

Salvage and sanitation harvest on the Forest is expected to occur in the future, but since these are opportunistic types of harvest, their location and amount cannot be determined with any certainty. At the programmatic level of the plan, the Forest does not believe it is appropriate to place a restriction or prohibition on the use of salvage or sanitation harvest in general or to identify site-specific situations where they could or could not occur. The application of salvage or sanitation harvest would be guided by the same requirements as any other vegetation treatments insofar as the planning and decisionmaking process (NEPA) and would not be arbitrarily applied across the landscape. The ecological as well as economic and social impacts associated with salvage or sanitation harvesting would be considered at the project level, based on site-specific conditions. Applicable information, including the best available science, would be used to guide project development and decisions. Consistency with the forest plan direction would be documented, as is required for all project-level decisions.

The forest plan contains components that recognize the important ecological role of fire and how it provides habitat for species including but not limited to the black-backed woodpecker, and it includes snag retention direction for harvest within fire areas (FW-DC-TE&V-03, 04, 23, 24, and 25; FW-GDL-TIMB-01, 02, and 03). Section 3.7.4 of the final EIS, subsection "Burned forest and dead tree habitats," discusses benefits to birds and other species. For example, the benefits of burned forests for boreal toads, grizzly bears, and ungulate species such as moose are discussed.

Salvage or sanitation harvest usually is conducted for the purpose of recovering some of the economic value of the trees and providing timber products that contribute to economic sustainability and income to local economies. Also, by capturing some of this economic value, it is sometimes possible to utilize those funds for other needed restoration activities. For example,

the salvage harvesting that occurred after the large fires on the Forest in the early 2000s yielded funds that allowed the planting of many hundreds of acres within the burned areas. Ecological reasons for salvage and sanitation harvest may also exist, such as the removal of burned trees to reduce the chance of bark beetles (e.g., Douglas-fir or spruce bark beetles) breeding and multiplying and spreading to adjacent, otherwise healthy trees.

The harvest of timber, including fuel reduction and salvage harvest, is allowable within most management areas in the Swan Valley; only in existing wilderness (management area 1a), recommended wilderness (management area 1b), and the wild segments of the eligible wild and scenic rivers (management area 2b) is timber harvest not allowed. The west-facing slope of the Swan Range is steep and within an inventoried roadless area, greatly limiting the feasibility of and opportunity for timber harvest. However, other vegetation management activities, such as prescribed fire, may occur where determined necessary to address vegetation and fuel conditions. The responsible official considered a range of alternatives and the different interests and uses of resources in the Swan Valley area, including excluding the Swan Face area from recommended wilderness, in the development of the preferred alternative.

Forest Products—Sustainable Timber

Comment (letter numbers 266, 2591, 2842, 2996, 3009)

The Forest plan should provide for a sustainable timber harvest level. Some commenters questioned whether the Forest has been implementing a sustainable timber program, given the change from large-diameter to smaller-diameter logs.

Response

As required by law, policy, and regulation, the forest plan provides for a sustainable level of timber harvest given management requirements and desired conditions for other resources, as indicated in the forest plan. As technologies and markets have changed over time, there has been a shift in the size and types of products provided by the Forest, such as the utilization of small-diameter trees. These shifts may continue to take place into the future but will be within the sustainable level of harvest under the direction in the forest plan. Monitoring of the forest plan will ensure sustainability requirements are being met by identifying any adaptations or adjustments necessary to the plan.

Forest Products—Timber Management

Comment (letter numbers 2574, 2940, 3021, 3122)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The forest plan's limits on the production of timber product outputs are not appropriate. Under all three action alternatives, the projected timber sale quantity falls significantly short of the local timber demand and the potential of the Forest. However, under alternative D, given the appropriate budget, the land base could support a much higher timber output and still meet the lynx, grizzly bear, and other constraints. The non-budget limited output of 63.5 million board feet/year modeled for alternative D provides the best estimate of the maximum capacity of the Forest to produce forest products and still meet all of the other forest plan objectives and constraints. It probably most closely represents what in the past would have been termed the

allowable sale quantity. This alternative provides for the most flexibility into the future while still meeting current constraints.

2. The land base used to calculate the sustained yield limit (SYL) is unclear. Page 79 of the draft forest plan defines the sustained yield limit as “the volume that could be produced in perpetuity on lands that may be suitable for timber production. Calculation of the limit includes volume from lands that may be deemed not suitable for timber production after further analysis during the planning process. The calculation of the SYL is not limited by land management plan desired condition, other plan components, or the planning unit’s fiscal capability and organizational capacity.” This definition is a misinterpretation of the National Forest Management Act. Such a volume cannot be removed on a sustained-yield basis precisely because it is prohibited by suitability determinations and other plan components. The sustained yield limit does not function as a limit using this formulation, and it must be recalculated for each alternative.

3. Some of the assumptions made in the modeling inherently limit the projected timber sale quantity and possibly the desired future condition. The arbitrary limitation of uneven-aged management to 500 acres per year and commercial thinning to 1,000 acres per year has an impact on acres treated, timber output, and the desired future condition. The rationale of higher costs associated with uneven-aged and commercial thinning prescriptions may be unfounded, especially given some of the new authorities available to the Forest Service through the farm bill. The sensitivity analysis on page 2-17 in appendix 2 indicates the model is quite sensitive to these restrictions. What would the rate of application of uneven-aged management be if the cost penalties were removed? From experience on other forests, the results are generally higher timber outputs, greater desired future condition attainment, and overall greater public acceptance of these types of silvicultural systems.

4. The difference between areas where timber production may occur, and where timber may be harvested only for other purposes is an important distinction. Including unsuitable lands in management area 6 is somewhat misleading and may be confusing. The Forest should clarify the rationale under which areas are included in each management area and how volume adjustments were made. In particular, explain how wildlife needs were factored into this determination.

5. It appears that the acres for timber harvest were not included in the calculation of the projected timber sale quantity (draft EIS, vol. 2, pp. 109–111). This could result in potentially doubling the projected timber sale quantity when acres where timber harvest is allowed are included.

6. There should be clearer definitions for projected timber sale quantity and projected wood sale quantity in the final EIS, with a consistent unit of measure. Choose either board feet or cubic feet or utilize both units when describing projected outputs.

Response

1. Thank you for expressing your views on timber management under alternative D. This alternative was considered by the deciding officer in the development of the preferred alternative.

As stated by the commenter, the non-budget limited output of 63.5 million board feet/year under alternative D is an estimate of the maximum capacity for this alternative, given the land allocations and the other resource constraints. This run was made with the objective of maximizing timber harvest in the first decade and then, given this level of harvest, maximizing movement towards vegetation desired conditions. To achieve the 63.5 million board feet/year, the forest would require \$6.058 million per year in the first decade. This is more than \$2 million over

current budget levels. Although this displays the potential for timber production under this alternative, it is not realistic to expect a \$2 million increase in the timber budget on the Forest.

2. The National Forest Management Act requires the Forest Service to “limit the sale of timber from each national forest to a quantity equal to or less than a quantity which can be removed from such forest annually in perpetuity on a sustained-yield basis” (16 U.S.C. 1611(a)). Since the National Forest Management Act does not specify the lands that are to be considered when determining this limit, the limitations on timber removal apply to all National Forest System lands, consistent with the Multiple-Use Sustained-Yield Act definition of sustained yield for providing outputs “without impairment of the land” (16 U.S.C. 531(b)). Thus, only those lands that prohibit timber removal based on technical factors related to the potential for irreversible damage to soil, slope, other watershed conditions (36 CFR 219.11(a)(iv) and 16 U.S.C. 1604(g)(3)(E)(i)), where there is no reasonable assurance of restocking (§ 219.11(a)(v-vi) and 16 U.S.C. 1604(g)(3)(E)(ii)), or where the land has been legally withdrawn (e.g., designated wilderness) (36 CFR 219.11(a)(i-ii)) are excluded from the lands when calculating the sustained yield limit. Given these are technical and legal constraints, the lands in these categories do not vary by alternative in the EIS (Forest Service Handbook 1909.12 chaps. 61 and 64.31).

The sustained yield limit is not a target; it is simply the upper limit of what could be offered annually in perpetuity based on growth and yield. Actual timber sale levels would depend on any number of factors, including the fiscal capability of the planning unit, timber market conditions, constraints on timber harvest in the forest plan (e.g., suitability components) and other sources, and project-level analysis. Anticipated sale volume based on these factors is reflected in the projected wood sale quantity and projected timber sale quantity described in FW-OBJ-TIMB-01 and 02.

3. These limitations were placed on the model not because of higher costs associated with the treatments but because these treatments would not be expected to be appropriate under most situations on the Flathead National Forest, based upon knowledge of local forest conditions and the conditions of forests that develop under a natural disturbance regime. Uneven-aged management would not likely achieve many of the desired forest conditions for the Forest, such as promoting shade-intolerant species that contribute to forest resilience and resistance (e.g., western larch, ponderosa pine, and western white pine), reducing the dominance of species more susceptible to insect and disease (such as Douglas-fir, grand fir), and creating larger opening sizes in portions of the landscape. Application of an uneven-aged management system will be employed when appropriate to maintain or achieve desired resource conditions, but it is likely to have limited application. Commercial thinning would be expected to be more widely employed as a treatment, and under suitable stand conditions it could contribute to achieving many vegetation desired conditions. However, its use would also be limited for a variety of reasons, including wildlife habitat considerations (such as lynx winter hare habitat conditions); access, terrain, and economic feasibility; and stand composition, age, and densities. It is important to understand that although these treatments were limited for modeling purposes in an effort to reflect a reasonable approximation of reality, it is the site-specific forest and other resource conditions and project-level objectives that will ultimately be the basis for the specific silvicultural prescription applied to the stand.

Sensitivity Analysis Run 5 (SR5) was done to look at these treatment constraints. This run added the limitations for group selection and thinning, and it also added limits for prescribed burning. Although the sensitivity analysis indicates that the addition of these constraints reduces the attainment of the desired future condition, it shows little change in the projected timber sale

quantity from Baseline Run 1 (BR1). See the comparison of run Sensitivity Analysis Run 5 to Baseline Run 1 in table 2-17 in appendix 2. Thus, the Forest does not believe these operational constraints have a large impact on the output results.

4. Timber suitability is a complex analysis, and the Forest agrees that there is an important distinction between lands suitable for timber production and those where timber harvest may occur only for other reasons. Timber suitability is not based solely on management area. As described in the forest plan, no lands within management area 6a are suitable for timber production, but some lands within management areas 6b and 6c are suitable for timber production. The steps for determining timber suitability are outlined in appendix 2 of the EIS. Appendix C of the plan also summarizes the determination of lands as suitable or unsuitable and how timber suitability determinations would be approached at the project level of analysis.

Lands suitable for timber harvest and not timber production have limited timber management opportunities. The Spectrum timber model is described in appendix 2 of the EIS. Lands that are not suitable for timber production but where timber harvest is allowed fall into management area groups 2 and 3. Lands that are suitable for timber production fall into management area groups 4 and 5. These management area groups are then constrained within the model to varying levels, based on forest plan direction. For modeling purposes, timber harvest within management area group 2 was limited to no more than 2,000 acres per decade. Harvest in management area group 3 was limited to no more than 50 percent of acres allocated to timber management, and at least 20 percent of the harvest had to be as group selection prescriptions as a way of reflecting the expectation of less intensive timber management in this management area group. Harvest in management area group 4 had no acre limitation, but at least 20 percent of the harvest had to be as group selection. Harvest in management area group 5 had no acre limitation, but at least 5 percent of the harvest had to be as group selection. The combination of these constraints, along with other resource constraints, reduced harvest in areas not suitable for timber harvest and adjusted the amount of harvest between management areas 6b and 6c.

The allocation of management areas was based on several factors. The amount of development, current uses, and special area designation all affected the allocation of management areas. The primary factors that affected the allocation of management area 6 (6a, 6b, and 6c) included the location of inventoried roadless areas, size and accessibility of grizzly bear core areas, harvest per decade allowed in lynx habitat, distribution of harvest in white-tailed deer winter range, location of high-value areas for wildlife connectivity, and site productivity. The allocation of management areas then varied by alternative based on the theme of the alternative. For a more detailed discussion of the allocation of management areas, see planning record exhibit #00684, which discusses the issue and alternative development for the draft EIS (USDA, 2015c).

5. Acres where timber harvest is allowed was included in determining the projected timber sale quantity. As stated on page 103 of volume 2 of the draft EIS, “The analysis area for the projected timber sale quantity is the lands suitable for timber production and lands where timber harvest may occur.” This has been further clarified in the final EIS. Thus, there is no potential doubling of projected timber sale quantity due to including lands where timber harvest is allowed.

6. Definitions of both projected timber sale quantity and projected wood sale quantity are included in the glossary of the forest plan. Further clarification and definitions have been added to the timber section in the final EIS. When referring to projected timber sale quantity, both cubic and board feet are included, as some of members of the public are familiar with board feet measurements and others prefer the use of cubic feet. When it comes to describing projected

wood sale quantity, however, only cubic feet are possible as this output includes non-sawtimber products that cannot be converted to board feet. This has been clarified in the final EIS.

Forest Products—Timber Models

Comment (letter numbers 38, 2574, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Table 2-15 in appendix 2 is an inaccurate comparison of alternatives. The models were run under different sets of objective functions as well as having different management area allocations. Therefore, it is inappropriate to compare the desired future condition scores in this table and make the judgment call that alternative D does the worst job of meeting the desired future condition. It would be good to have a more accurate comparison between alternatives B and D, running alternative D under the same objective function as alternative B while still attaining the potential for a higher projected timber sale quantity under alternative D.
2. Regarding removing riparian management zones from vegetation management in the timber model, this represents a significant acreage (427,000 acres), which is nearly the same area as the entire suitable timber base. What is the effect on projected timber sale quantity and the desired future condition if these areas are allowed some limited vegetation management?
3. The Spectrum model operates under the assumption of a certain amount of stand-replacing wildfire. What are the implications of higher stand-replacing fire activity on the Forest and the ability to meet the projected timber sale quantity and desired future condition? There is certainly a correlation between the amount of stand-replacing fire and the percentage of the landscape that is precluded from vegetation management. This is another reason to maintain the highest number of acres available for management on the Forest.
4. The Production of Natural Resources section of the draft EIS and appendix 2 (and the proposed forest plan's desired future conditions, objectives, guidelines, and standards) are especially biased towards timber harvest, in large part by defining desired future vegetative conditions that require logging and by then considering budget and grizzly bears to be "constraints" on meeting those timber harvest levels (e.g., appendix 2, pp. 2-26 and 2-27). Less management, lower budgets, and greater grizzly bear security should be seen as good things, both fiscally and environmentally—but the SPECTRUM model and assumptions appear to be front-loaded to favor "the most flexibility in management and no constraints" (appendix 2, p. 2-26).
5. Page 2-22 of appendix 2 in the draft EIS notes some important modeling assumptions without a complete explanation, such as the statement, "Because of silvicultural limitations and to better achieve forest plan desired conditions . . ." The Forest should explain why the decision is "better." It seems likely that similar value judgments lie behind tables 2-9 and 2-10, and these should also be explained further.

Response

1. The commenter is correct; the objective functions for the alternatives were different, which led to differences in outputs from the model, including the desired future condition score. Given the emphasis under alternative D for active management and timber harvest to contribute to social and economic sustainability, this alternative was run with an objective function to maximize timber in the first decade and then to maximize the desired future condition. Alternatives B and C

were run with an objective function to maximize the desired future condition. This difference in the objective function for alternative D led to an increase in the amount of timber production but a decrease in the desired future condition score in the model.

The objective functions used in running alternative D are an appropriate modeling of this alternative, given its increased emphasis on timber production compared to the other alternatives. The results depicted in table 2-15 in appendix 2 are accurate and appropriate, given the desired modeling of the alternatives.

To provide the comparison requested by the reviewer, an additional run was made for the final EIS to generate a comparison of alternative D using the same objective function as B modified and C. The results of this analysis can be found under the Sensitivity Analysis section of appendix 2 of the final EIS. The run is Sensitivity Analysis Run 8 (SR8), with results shown in table 2-18. As indicated in this table, the desired future condition score from this run is slightly improved compared to the score under alternative B modified in table 2-15. This indicates that the increased allocation of more intensive management areas under alternative D could produce an improved desired future condition score, given the objective function of maximizing the desired future condition. The change in objective function also resulted in a decrease in timber production, but it was still slightly higher than that found under alternative B modified.

2. Based on plan component FW-SUIT-RMZ-01, riparian management zones are not suitable for timber production under all the action alternatives. Timber harvest may be allowed in these areas for other multiple-use purposes, however, depending on the management area and other timber suitability criteria.

Riparian management zones were updated in the final EIS, and they total approximately 411,000 acres forestwide. Not all of these acres directly affect lands suitable for timber production. Under all alternatives, 75 percent or more of these acres are either within management areas that are not suitable for timber production or meet other criteria that makes them not suitable (e.g., administratively withdrawn, have potential for irreversible soil or watershed damage, or regeneration not assured). The effect of riparian management zones on timber suitability is discussed in the final EIS (see section 3.21.2). Riparian management zones reduced the acres suitable for timber production by 103,500 acres in alternative B modified, 66,900 acres in alternative C, and 105,900 acres in alternative D. Because it has more acres allocated to management areas not suitable for timber production, alternative C has fewer acres not suitable for timber production solely because of riparian management zones. Riparian habitat conservation areas reduced the acres suitable for timber production in alternative A by 56,100 acres. Under the action alternatives, the percent effect of riparian management zones on timber suitability is similar, with an 18 percent reduction in lands suitable for timber production because of riparian management. The percent reduction for alternative A is lower, with approximately 10 percent reduction in lands suitable for timber production. These acres may allow timber harvest, but they are not suitable for timber production. This decrease in lands suitable for timber production reduces the amount of timber that may be harvested under all alternatives. For more information on riparian management and timber suitability, see Frament (2017).

The number of acres of riparian management zones where timber harvest is allowed is discussed in the final EIS (see section 3.2.10). As discussed in this section, the acres of riparian management zones on lands not suitable for timber production but where timber harvest is allowed vary by alternative. Alternative B modified has approximately 157,100 acres, alternative C has 128,500 acres, and alternative D has 169,100 acres of riparian management zones that may allow timber harvest. This is approximately one third of the total acres not suitable for timber

production but that allow timber harvest for each alternative. Alternative A has 124,600 acres of riparian habitat conservation areas on lands not suitable for timber production but that may allow timber harvest, which is 28 percent of the total acres not suitable for timber production but that allow timber harvest.

The projected timber sale quantity from lands not suitable for timber production is displayed in table 153 in section 3.21 of the final EIS. Under all alternatives, the projected timber sale quantity from lands not suitable for timber production is less than 4.5 million board feet, with alternative C having the greatest volume at 4.2 million board feet and alternative D the least at 0.6 million board feet in the first decade. This volume is not scheduled and not managed on a rotation basis. The riparian management zones and riparian habitat conservation areas would comprise a portion of the acres managed to generate this volume.

3. The SIMPPLLE model was used to simulate wildfire and other natural disturbance processes. The Spectrum model then used the average of several SIMPPLLE model simulations to reflect wildfire activities. Acres of wildfire were averaged for each decade for decades 1 through 5. Acres of wildfire for decades 6 through 25 were averaged over that time span to keep the Spectrum model to a reasonable size without losing accuracy in the more current decades.

Of course, the actual number of acres that will be burned in the future in wildfires is not known. The Spectrum modeling accounted for the average acres burned each decade as estimated by SIMPPLLE, simulating the loss of these acres to timber management. Monitoring of the forest plan will determine whether stand-replacing fire activity has been underestimated and whether there is a need to adjust the projected timber sale quantity and desired future condition.

Timber harvesting is allowed on many acres that are not suitable for timber production to allow for vegetation management when needed and appropriate. See section 3.21 in the final EIS. These acres are thus available for vegetation management when it would improve other resource conditions.

4. The section referred to by the commenter is the “sensitivity analysis” of the Spectrum model. As described on page 2-25 of appendix 2 of the draft EIS, “Sensitivity analysis is conducted to examine the trade-offs caused by the constraints and determine if the Spectrum model is working correctly.” Thus, this section is not a description of alternatives or runs made to determine the outputs associated with a particular alternative. It is merely a description of the analysis that was done to determine the potential effects of constraints and management considerations on modeled results.

The quote regarding the “most flexibility in management and no constraints” is a reference to a calibration run that had no constraints whatsoever. This run produces the highest desired future condition score possible for the model. This beginning point shows how well the alternatives are able to achieve the desired future condition. But, it is not a run that reflects the management considerations under the forest plan or the desired management on the Forest. There is no “front-loading” of the Spectrum model to favor this calibration run, as evidenced by the various constraints and management considerations built into the model for each alternative.

5. The section referred to by the commenter documents constraints that were included in the model to meet the intent of the forest plan’s desired conditions and the logistical limitations on the ground. The term “better” refers to the model’s ability to reflect management considerations for achieving desired conditions in the forest plan. The model was built to reflect, as well as possible, management under the forest plan. The introduction to the constraints section on pages

2-20 and 2-21 in appendix 2 states that constraints were built “in response to forest plan direction, regulations, and as a means of improving the model’s ability to simulate actual management of NFS lands. Constraints as defined in the model were for modeling purposes only and do not create limitations for plan implementation.” The use of the term “constraint” is not intended to make a value judgement; it is merely standard modeling terminology. There are no value judgments in tables 2-9 and 2-10; it is simply a method to describe management that could occur under the various management areas.

Forest Products—Timber Suitability

Comment (letter numbers 2765, 2901, 2940, 2996, 3097)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Land type 73 should be listed as one of the areas considered unsuitable for timber production.
2. Alternative C should prohibit timber harvest and the production of timber volume from lands considered unsuitable for timber production.
3. The draft EIS states that one difference between the no-action alternative and the action alternatives is that roadless areas, making up 20 percent of the Forest, are suitable for timber production in the former and not in the latter (vol. 1, p. 12). However, the table showing suitable acres does not reflect that large of a change. The suitability discussion (draft EIS, vol. 1, p. 22) suggests that the roadless areas might have been part of the changes in tentatively suitable acres in alternative A. This needs to be clarified.
4. Appendix 2, table 2.1 in the draft EIS contains the determination of which lands are suitable for timber production. There is no rationale provided for the acreage of areas where timber harvest is not compatible with the land area’s desired condition and objectives. The Forest should provide an actual analysis of the application of management areas suitable for timber production to each biophysical setting (potential vegetation type) and to each identified or modeled wildlife habitat, in accordance with Forest Service Handbook 1909.12 chapter 61.2.
5. The Flathead National Forest should identify which lands are determined to be industrial logging lands. If logging were only allowed in the 13-22 percent identified as timber lands, that would be fine. Unfortunately, logging will be allowed everywhere for a multitude of reasons throughout the Forest. The Forest should monitor timber harvests and at the end of every year release information on how much timber came from timber lands versus how much timber came from all other land designations.
6. The forest plan seems to allow timber harvest nearly everywhere, but it should limit timber harvest. Timber harvest should not be allowed in management areas 1b, 2a and 2b, and 5.

Response

1. Land type 73 is moderate to high productivity for timber production, although steep slopes limit equipment and access. At the programmatic level of analysis for the forest plan, conditions in land type 73 would not necessarily render this land type unsuitable for timber production. Timber production suitability is confirmed at the project level. See appendix C of the plan, which summarizes the process for determining lands suitable and not suitable for timber production and its application at the project level.

2. Alternative C does have proportionally more acres of harvest and timber volume produced from lands unsuitable for timber production than the other alternatives, although the overall volume produced is lower. Projected timber sales are somewhat higher on lands not suitable for timber production under alternative C than under the other alternatives because of the higher amount of unsuitable lands in this alternative. As per forest plan direction, harvest may be allocated in management areas where harvest is allowable, although there are limitations in the model that restrict the amount or type of harvest in those areas. Because timber harvest is a tool to move vegetation towards desired conditions, it is appropriate to allow this management on lands where timber harvest is allowed. However, timber harvest is greatly reduced on these lands because of other resource concerns, including habitat connectivity. The actual location of harvest areas would be determined at the site-specific level.

3. Page 12 of volume 1 of the draft EIS describes the total number of acres in inventoried roadless areas on the Forest as 478,757 acres. Not all of these acres were suitable for timber production under the 1986 forest plan because they were non-forested or were in management areas that were identified as not suitable for timber production. The figure on page 22 refers to lands suitable for timber production under alternative A, which is based on the 1986 plan suitability updated to include all plan amendments, new regulations, and updated data.

Pages 103 and 104 of volume 2 of the draft EIS (in the final EIS, section 3.21.1) describe timber suitability under alternative A and changes made to the 1986 forest plan based on existing laws and regulations and updated data. Table 48 on page 103 (in the final EIS, section 3.21.1, table 149) compares timber suitability under the no-action alternative (alternative A) to timber suitability as defined in the 1986 forest plan. Footnote 2 to this table lists the acreage of inventoried roadless areas (460,791 acres) that have been withdrawn from timber production under the 2001 Roadless Area Conservation Rule. This figure does not match the total acres of inventoried roadless areas (478,757 acres, section 1.4.5 of the final EIS) because a small amount of these acres are non-forested and are subtracted in the previous step. The discussion following table 149 goes on to describe the acres that are not suitable for timber production but where timber harvest is allowed. It states, “Under the no- action alternative (alternative A), 437,663 acres are suitable for timber harvest that are not suitable for timber production. A large portion of this acreage is comprised of inventoried roadless areas (approximately 320,773 acres) that are allocated to management areas where timber harvest is allowed to meet desired conditions.” Relatively minor changes in acres occurred between the draft and final EIS in inventoried roadless area lands where timber harvest is allowable because of refinements and corrections in the various GIS layers, such as management area maps, that are used in the timber suitability analysis.

4. The requirements under Forest Service Handbook 1909.12 section 61.2 do not require an analysis by biophysical setting (i.e., potential vegetation type) or modeled wildlife habitat. Rather, “the Responsible Official should consider the following to determine if timber production is compatible with the desired conditions and objectives of the plan:

1. Timber production is a desired primary or secondary use of the land.
2. Timber production is anticipated to continue after desired conditions have been achieved.
3. A flow of timber can be planned and scheduled on a reasonably predictable basis.
4. Regeneration of the stand is intended.

5. Timber production is compatible with the desired conditions or objectives for the land designed to fulfill the requirements of 36 CFR 219.8 to 219.10.” (Forest Service Handbook 1909.12 chap. 61.2)

As stated in appendix 2, these lands were identified by management area allocation. Those lands suitable for timber production are found in management areas 6b, and 6c and parts of 4b and 7. These management areas were allocated to lands that meet criteria 1 through 5. Additional information has been added to appendix 2 of the final EIS to explain this process. Additionally, riparian management zones are not suitable for timber production, but timber harvest is allowable to make progress towards desired conditions, consistent with riparian management zone plan components. Effects of lands suitable for timber production are discussed throughout chapter 3 of the final EIS. Also see the responses and comments under Forest Products—Timber Management, specifically those on management area allocation.

5. The Forest has identified lands that are suitable for timber production and lands where timber harvest may be allowed. See the timber suitability maps in appendix 1 of the final EIS. Logging is not allowed everywhere on the Forest. Section 3.21 of the final EIS describes the acreage and criteria for lands suitable for timber production and lands where timber harvest may be allowed.

The Forest will be monitoring the amount of acres treated with timber harvest in some areas that are not suitable for timber production, including inventoried roadless areas and riparian management zones. However, there is no requirement to monitor all timber harvest broken out by lands suitable for timber production and lands not suitable for timber production but where timber harvest is allowed. The Forest will monitor the amount of timber harvested on both suitable and unsuitable acres.

6. Timber harvest is prohibited in management area 1a, management area 1b, and the wild segments of management areas 2a and 2b. In other management areas, harvest may be allowed, but only under certain circumstances that are specific to that management area. In some areas, harvest is more restricted than in others. In all cases, harvest must be consistent with desired conditions and other plan components for the management area. This direction provides the opportunity to utilize harvest as a tool, if deemed appropriate, to achieve desired conditions in the management area that will contribute to desired conditions forestwide.

Grazing

Grazing—General

Comment (letter numbers 2821, 2996)

Cattle grazing has an impact on riparian and stream habitat in native fish watersheds.

Response

Plan components protect riparian and stream habitat in native fish watersheds across the Forest (also see comments and responses under Grazing Allotments—Alternatives and Plan Components). There are nine allotments in the Swan Valley and Salish Mountains geographic areas. Of the nine allotments, only one (Piper Creek) is within a bull trout or cutthroat trout watershed, and that allotment only has five cow/calf pairs, a very small number with a very low risk of impacts. The Holland Lake Allotment is below Holland Lake and thus has no effect on bull trout since bull trout occur in the lake and directly in the mouth downstream from Holland Falls. Seven of the nine allotments have been inactive for periods over the last five years, so

exposure to detrimental effects on riparian zones and fisheries has been limited. Monitoring has shown that stream habitat within allotments is in good condition with the exception of the Swaney allotment, where brook trout are present but not cutthroat or bull trout.

Grazing—Standards and Guidelines

Comment (letter numbers 108, 3097)

The Forest is on the right track in terms of phasing out allotments with recurring conflicts between livestock and grizzly bears and recognizing that this has proven to work successfully on other Forests.

Regarding livestock grazing standard FW-STD-GR-08, which says that new livestock handling and/or management facilities will be located outside of riparian management zones), *all* livestock handling and/or management facilities—administrative, outfitted, and public—should be located outside of riparian management zones.

Response

The decisionmaker considered all comments and reviewed the adequacy of plan components for sustaining resources. The Forest acknowledges that there may be localized impacts, such as soil compaction, inside of riparian areas from sites such as corrals for outfitters, but these are managed through permit administration and are generally minor and dispersed. Plan components ensure that future sites will be outside of riparian areas; the number of sites that the Forest has now are limited.

Grazing Allotments—Alternatives and Forest Plan Components

Comment (letter numbers 108, 290, 2888, 2904)

Alternative C for grazing is the best alternative.

The forest plan components for grazing should be improved. The Forest should adopt the following forest plan component: When resource conflicts arise between the management needs for productive grazing and drought, wildfire impacts, threatened and endangered species, recreation, water quality, water quantity, economic viability of a ranching operation, disease, conflict with native wildlife or other multiple uses, and the permittee is willing, retiring and permanently closing grazing allotments is a viable and permissible range management tool.

The Forest Service should require that non-lethal techniques be employed if there is a grizzly bear-livestock conflict before grizzly bear removal is even considered.

Response

The support for alternative C was noted. The responsible official carefully considered all alternatives. Alternative B modified, the selected alternative, includes numerous plan components that reduce the risk of livestock impacts to other resources. Forestwide standards and guidelines in the Livestock Grazing, Watershed, and Riparian Management Zone sections of the forest plan protect water, riparian areas, and key grizzly bear food production areas; limit grizzly bear-livestock conflicts; and specify that there shall be no net increase in grazing allotments in the grizzly bear primary conservation area. Specific to the Swan Valley, guideline GA-SV-GDL-04 states that open and active cattle grazing allotments should be closed if the opportunity arises with a willing permittee. As discussed in section 3.7.5 of the final EIS, subsection “Grizzly bear

habitat and livestock allotments,” grizzly bear-livestock conflicts have not been an issue on the Forest. Monitoring item MON-NCDE-03 states that the number of grizzly bear-livestock conflicts occurring annually on National Forest System lands will be monitored. Adjustments to the plan can be made if needed. The decision to remove a grizzly bear is made according to established protocols agreed upon by the USFWS grizzly bear recovery coordinator and MFWP. The wording of standard FW-STD-GR-01 was refined in alternative B modified to reflect actions under Forest authority.

Grizzly Bear

Grizzly Bear—Concerns about Delisting

Comment (letter numbers 44, 304, 324, 2807, 2821, 2888, 2940, 2985, 3005, 3014, 3033, 3087)

The Forest Service should not propose management based on the premise that the NCDE population is recovered. The Forest Service should continue habitat protections whether or not the grizzly bear is delisted and should add forest plan components that provide for the continued conservation and recovery of the NCDE population. If the grizzly bear is delisted, the Flathead National Forest will need to meet National Forest Management Act requirements to identify the grizzly bear as a species of conservation concern and have plan components to maintain a viable population.

Response

Statements in the draft EIS asserting that the NCDE population is “recovered” have been removed in the final version. Where appropriate, the Forest Service clarified in the final EIS that the population has been stable to increasing, its size is much larger than the previous estimates derived from sightings of females with young, the population has fully occupied all bear management units, and the mortality limits established in the recovery plan have not been exceeded.

Part of the purpose of the proposed forest plan amendments is to ensure the adequacy of regulatory mechanisms regarding habitat protection across the national forests in the NCDE in support of delisting of the grizzly bear. It is clearly stated in the final EIS that sustaining the NCDE grizzly population will depend on continued, effective management of the NCDE grizzly bear’s habitat. The forest plan components that contribute to conserving the NCDE grizzly bear population and its habitat will be implemented whether or not the USFWS takes action to delist the population. The USFWS biological opinions for the amendment forests and the Flathead’s revised forest plan (USFWS, 2017a, 2017b) confirm that management direction will not jeopardize the NCDE population and will support recovery.

If and when the grizzly bear is delisted under the Endangered Species Act, the Forest Service will assess whether an at-risk status, such as being identified by the regional forester as a sensitive species, is warranted for those Forests in the NCDE that have not yet identified species of conservation concern per the 2012 planning regulations. For Forests in the NCDE that have amended or revised forest plans under the 2012 planning rule, the Forest Service will consider the grizzly bear as a potential species of conservation concern, as required by Forest Service Handbook 1909.12 chapter 10 section 12.52(d)(2)(b). Such consideration is required for species that have been removed within the past five years from the Federal list of threatened or endangered species

Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest

Comment (letter numbers 2888, 2904, 3021)

The Forest Service should consider more standards aimed solely at conserving and improving connectivity corridors, including the Salish demographic connectivity area. The Forest should apply amendment 19 standards and methodologies in zone 1 and the demographic connectivity areas. The excessive road densities of the Salish demographic connectivity area as currently proposed are unlikely to allow female occupancy; the Forest must protect significant and essential habitat pathways through management areas 6b and 6c in the Salish Mountains geographic area. All existing roadless areas that connect the Salish Range to the Whitefish Range should be designated as nonmotorized to protect these wildlife corridors.

Management area 6b boundaries should be pulled back significantly towards the North Fork Road and in other areas changed to management area 6a. Management areas 6a and 6b, coupled with the Coal Creek State Forest, make connectivity between the Whitefish Range and Glacier National Park difficult. The Forest should lower the amount of logging and roads at the mouths of Trail and Logging Creeks to allow necessary linkage between these two important areas.

The combination of Hungry Horse Reservoir, which is bracketed by two high-use roads, management area 7 (focused recreation areas), and management area 6b (general forest moderate-intensity vegetation management) creates a significant fracture zone preventing essential east-west connectivity for wildlife.

The Forest should designate a Coram connectivity area due to the management area 6a (general forest low-intensity vegetation management) designation, private land development, and U.S. Highway 2.

The Forest should not designate a Coram connectivity area.

GA-MF-OBJ-01 should read: “Acquire parcels or easements for wildlife crossings of sufficient number to allow for increasing exchange of biological information and genetics along Highway 2 and the BNSF railway.” These parcels should be acquired in the identified (GA-MF-DC-06) connectivity areas of Nyack, Essex, and Pinnacle (referenced as figure B-54).

Response

Outside of the primary conservation area, grizzly bear management subunits have not been delineated. The moving-window analysis methodology used for amendment 19 creates a density surface that is quantified across a bear management subunit. Zone 1 and the Salish demographic connectivity area have a larger representation of private lands than the primary conservation area. For these reasons, using the moving-window method or applying amendment 19’s standards outside of the primary conservation area would be problematic. However, other plan components that promote the connectivity of grizzly bear habitat in zone 1 and the Salish demographic connectivity area, including linear road density standards, have been considered under the action alternatives for the forest plan and amendments.

Prior to conducting the analysis on the effects of roads and trails on grizzly bears in zone 1 (including the demographic connectivity areas), the Forest Service discussed analysis methods with the USFWS grizzly bear recovery coordinator. He stated that Boulanger and Stenhouse (2014) provide the best available scientific information on the effects of open roads on grizzly bears of various sex and age classes (C. Servheen, USFWS, personal communication, 2015). As

stated in the final EIS, Boulanger and Stenhouse based their findings on telemetry data from 142 grizzly bears in Alberta. Their study used very accurate data from GPS radio collars that were programmed to acquire a location every one to four hours. In addition, very high frequency ear tag transmitters (ATS) were fitted on all captured bears. The authors were able to relate road density data to occupancy by and mortality of bears. In sections 3.7.5 and 6.5.5 of the final EIS, under “Grizzly bear,” the Forest quantified the linear miles of routes open to public motorized use in zone 1 (including the demographic connectivity areas) and related these densities to the thresholds identified by Boulanger and Stenhouse (2014).

There is one inventoried roadless area in the Flathead National Forest portion of the Salish demographic connectivity area. Its roadless status would be maintained in the forest plan (also see the comments and responses under Grizzly Bear Conservation Strategy—Connectivity).

Along the Canadian border between Glacier National Park and the Whitefish Range, the forest plan’s alternative B modified adds about 80,000 acres of recommended wilderness (management area 1b) that is not suitable for commercial timber harvest, mechanized use, or motorized use. Most of the remainder of the area between recommended wilderness and the North Fork Road (at the mouth of Trail Creek) is in management area 6a (general forest low-intensity vegetation management), which is not suitable for timber production, and this provides greater emphasis on wildlife habitat connectivity and linkage. Additional management area 6a areas are designated in the vicinity of Coal Creek State Forest, Blankenship Road, and the Trail Creek to Whale Creek areas. The commenter also mentioned Logging Creek over which the Forest Service has no authority since it is located in Glacier National Park.

In the Coram area, Forest Service lands are interspersed with a large representation of private lands. Although managing for connectivity may be difficult in this area, the forest plan includes several plan components to promote connectivity. Guideline FW-GDL-IFS-13 addresses connectivity across areas of highway disturbance (including the Coram area). In addition, an area near the confluence of the North Fork of the Flathead River, Middle Fork of the Flathead River, and South Fork of the Flathead River west of Coram is designated as management area 6a (general forest low-intensity vegetation management) to emphasize wildlife habitat connectivity. Key connectivity areas are also identified in the forest plan’s geographic areas, along with desired conditions for highway crossings, highway approaches, and lands. A connectivity management area is discussed in the final EIS under section 2.6.7, “Wildlife Habitat Connectivity.” See also the comments and responses under Wildlife—Modeling and Managing Connectivity and Grizzly Bear Conservation Strategy—Connectivity.

Some commenters voiced their concern for connectivity around Hungry Horse Reservoir. The flooding of the reservoir itself had detrimental effects on connectivity for some species, but some species (such as grizzly bears) are known to swim across it. The NFS roads that surround the reservoir are not barriers to animal movement, as discussed in the sections of the final EIS on connectivity for a variety of wildlife species, including the grizzly bear. As explained in the section of the forest plan on the Hungry Horse Reservoir management area 7 (focused recreation areas) in the Hungry Horse geographic area, the desired condition for the southern end of the reservoir emphasizes dispersed recreation accessible by boat and vehicle, with sites scattered along the 35-mile reservoir shoreline and undeveloped areas in between. Plan components for riparian management zones also apply to the area within 300 feet of the reservoir, contributing to wildlife connectivity around the reservoir.

Grizzly Bear—Draft EIS Analysis

Comment (letter numbers 32, 44, 290, 298, 306, 2574, 2601, 2816, 2879, 2888, 2904, 2940, 2984, 3005, 3021, 3042)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

Some commenters expressed general support for the NCDE conservation strategy and alternative 2 for the amendment forests (B for the Flathead National Forest), whereas others asked the Forest Service to make specific modifications in the analysis.

1. The Forest Service should continue to implement amendment 19 on the Flathead National Forest and also apply it to bear management subunits on the amendment forests and in the demographic connectivity areas.
2. The Forest Service should remove all statements in the EIS claiming that the NCDE grizzly bear population is recovered.
3. The Forest Service should take a more conservative approach because of the risk of ecological traps.
4. The Forest Service should wait until the final Grizzly Bear Conservation Strategy and/or habitat-based recovery criteria are finalized before completing the forest plan revision and amendments.
5. The Forest Service should not use the 2011 baseline because in that year approximately 40 of the 126 bear management subunits on the Flathead National Forest were not meeting existing open motorized route density, total motorized route density, and/or core requirements. The Forest should explain what is meant by “the baseline can be adjusted.”
6. The Forest Service should provide a higher level of protection for grizzly bears by not allowing temporary changes in open motorized route density, total motorized route density, and secure core; by not allowing unlimited development of recreation sites outside the primary conservation area and demographic connectivity areas; and by not removing the no surface occupancy requirement on the Helena National Forest.
7. The statement in the draft EIS, “Under the no-action alternative, within the recovery zone a number of regulations and practices related to livestock allotments have been and would continue to be implemented . . .” is confusing and should be clarified.
8. The Forest Service should account for cumulative impacts, including private land development, increasing traffic, loss of whitebark pine, climate change, and declining bear populations in Canada, and should also address connectivity within the Crown of the Continent region.
9. Volume 1 of the EIS should identify key indicators and measures for grizzly bears and other species. The EIS should address the alternatives in comparative form.

Response

1. Continued implementation of amendment 19 on the Flathead National Forest is analyzed as alternative A in the EIS. See also the comments and responses under Grizzly Bear—Road Density

and Security Core Habitat, Best Available Scientific Information—Amendment 19, Grizzly Bear—Support for Amendment 19 Standards.

For the amendment forests, this alternative was considered but was eliminated from detailed study (final EIS, section 5.6.5) because it is not feasible to implement in all bear management subunits. For example, the unique configurations of particular subunits, proximity to private land developments, the need to maintain open roads for emergency egress, and the requirement to provide reasonable access to private land inholdings may make it infeasible to meet all of the 19-19-68 criteria. Existing levels of open motorized route density, total motorized route density, and secure core are presented in the final EIS by Forest for each bear management subunit. Extensive monitoring of the NCDE grizzly bear population indicates that the grizzly bear population in the NCDE has been increasing in size and expanding its distribution (Costello et al., 2016). Habitat conditions and management actions on the national forests have contributed importantly to the increased population size, increased distribution, increased genetic diversity, and improved status of the grizzly bear across the NCDE (Costello et al., 2016; Mikle et al., 2016) even though amendment 19 standards have not been implemented in all bear management subunits.

Outside of the primary conservation area, bear management subunits have not been delineated. Prior to conducting its analysis on the effects of roads and trails on grizzly bears in zone 1 (including the demographic connectivity areas), the Forest Service discussed analysis methods with the Grizzly Bear Recovery Coordinator. He stated that Boulanger and Stenhouse (2014) provide the best available scientific information on the effects of open roads on grizzly bears of various sex and age classes. The findings of Boulanger and Stenhouse (2014) are reliable, accurate, and relevant to the NCDE. The Forest Service quantified the linear miles of routes open to public motorized use in the demographic connectivity areas and related these densities to the thresholds identified by Boulanger and Stenhouse in the effects analyses in the final EIS and biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017). In response to public comments, the Forest Service refined and supplemented the discussion in the final EIS of open road/route densities in relation to the objectives for grizzly bears in zone 1, the demographic connectivity areas, and zone 2.

2. Statements asserting that the NCDE grizzly bear population is “recovered” have been removed. Where appropriate, the Forest Service clarified in the final EIS the available information about the status of the NCDE population.

3. Papers by Lamb et al. (2017), Hale et al. (2015), Mowat and Lamb (2016), Mikle et al. (2016), and Mace and Waller (1998) concerning source/sink dynamics and ecological traps were brought to the Forest Service’s attention. These discuss the source/sink dynamics of metapopulations and/or ecological traps. A metapopulation consists of a group of spatially separated populations of the same species. Each population is relatively independent of the others, with smaller populations being more prone to inbreeding depression and local extinction. The metapopulation as a whole may be stable if there is connectivity between the seemingly isolated populations, even though some populations may periodically “wink out” and then be recolonized (Hanski & Gilpin, 1997). The draft NCDE Grizzly Bear Conservation Strategy incorporated the concept of source/sink dynamics, indicating that the NCDE could serve as a source population to other recovery zones in the United States that remain threatened by small population size (USFWS, 2013, p. 2). The draft conservation strategy (p. 20) further recognized that zone 3 is not expected to be continuously occupied by bears but rather will likely always rely on the primary conservation area as the source for more bears, similar to the source/sink dynamics observed between mountain and prairie habitats along the Rocky Mountain Front in Alberta.

Proctor et al. (2012) identified subpopulations of grizzly bears in the transborder area by evaluating genetic clustering and habitat fragmentation. They found that bears in the NCDE recovery area in the United States are part of a subpopulation that also includes grizzly bears in adjoining areas of Alberta and British Columbia south of Highway 3 in Canada. The grizzly bear populations in the Purcell South Yaak, Cabinet, and Yellowstone areas were shown to be separate subpopulations.

Based on mortality, movement, and occupancy data collected from 1987-1996 in the Swan Mountains, Mace and Waller (1998) described the multiple use zone as a source area and wilderness and rural zones as sink areas within the NCDE. However, more recent data on population trend, distribution, and genetic patterns in the NCDE show an increasing population with low genetic differentiation (Costello et al., 2016; Kendall et al., 2009; Mace et al., 2012). Kendall et al. (2009) reported that genetic sampling showed that the NCDE population had generally remained integrated and connected to Canadian populations. Mickle et al. (2016) found evidence that reconnection at the eastern and southern peripheries of the population was taking place. A population that is well connected, increasing in numbers, and expanding its distribution is by definition not a sink, despite gradients in habitat quality and population density that may exist.

Ecological traps are scenarios in which organisms select poor-quality habitat, which may be falsely attractive and have high mortality risk due to rapid environmental change. Lamb et al. (2017) found evidence that a region in British Columbia with rich food resources for bears and high human density functioned as an ecological trap due to high bear mortality that led to local population declines of about 8 percent per year and declines of at least 1.5 percent per year in the source populations. Maintaining the integrity of intact landscapes and curtailing human-caused mortality were recommended to counter the impact of this ecological trap. In the NCDE, the primary conservation area is predominantly NFS lands (about 61 percent) and Glacier National Park (about 17 percent), which provides large, intact blocks of habitat. Extensive efforts by Federal, State, and local agencies, tribes, and private organizations and individuals have been and continue to be made to reduce grizzly bear mortality, as described in section 4.1.4 and the “Cumulative effects” subsection of section 6.5.5 of the final EIS. Monitoring of the NCDE grizzly bear population will be ongoing, and adjustments to management will be made if warranted by a change to a downward population trend.

Zone 2 is not considered necessary to the recovery of the NCDE population. The objective for this area is to allow movement by male bears sufficient for genetic interchange from the NCDE to the Greater Yellowstone Ecosystem. Unlike the recovery zone/primary conservation area, zone 2 is not intended to be a source habitat. As the population size in the primary conservation area had increased, the number of sightings of bears in zone 2 has been gradually increasing. The Forest Service is aware of no evidence of a mortality sink on National Forest System lands in zone 2. Additional analysis has been added to the final EIS concerning habitat conditions on the portions of the Beaverhead-Deerlodge National Forest that adjoin the Helena National Forest to better assess the potential for the movement of male bears through NFS lands.

4. USFWS is continuing its work on the draft NCDE Grizzly Bear Conservation Strategy and habitat-based recovery criteria. The Forest Service has provided information to USFWS but is not in control of the process or schedule for completion of those documents. In conjunction with the revision of the Flathead forest plan, the Forest Service is taking the opportunity to concurrently amend the Helena, Lewis and Clark, Kootenai, and Lolo forest plans for the management of grizzly bear habitat. It is not necessary for the Forest Service to wait until the conservation

strategy and habitat-based recovery criteria are finalized before revising or amending its plans. The Forest Service is using the best available scientific information at this time. When the USFWS finalizes its documents, the Forest Service will be able to assess the conservation strategy and the habitat-based recovery criteria to determine whether there are substantive differences from the revised Flathead forest plan and amended forest plan direction and, if so, will follow established procedures to make any needed changes.

5. The 2011 baseline was selected in the draft conservation strategy (USFWS, 2013) because at that point the population size was estimated to be greater than 765 bears, more than double the existing estimate based on sightings of females with young (Kendall et al., 2009); the recovery criteria for occupancy of bear management subunits had been met; and the mortality limits had not been exceeded. Ongoing research and monitoring of the NCDE grizzly bear population indicates that it continues to be stable to increasing (Costello et al., 2016) and is expanding in distribution, even though the Forest does not meet the 19-19-68 parameters of amendment 19 in every grizzly bear management subunit.

Over the more than two decades that the Flathead National Forest has been implementing amendment 19, the Forest has learned that many factors can change the percentage numbers for open motorized route density, total motorized route density, or security core even though conditions on the ground do not change. For example, updated data or the acquisition of private lands with motorized routes that were not previously included would change the calculated values for a bear management subunit but do not indicate a change in actual habitat conditions. The Forest has clarified the language of standards FW-STD-IFS-02 for the Flathead's forest plan and FW-STS-AR-02 for the amendments to more clearly identify the conditions that may result in an adjustment of the baseline. Any such changes will be tracked as part of forest plan monitoring.

6. See the comments and responses under Grizzly Bear—Road Density and Security Core Habitat regarding temporary changes and project duration. Through consultation with the USFWS, Forest Service timber harvest projects have had terms and conditions that allow one year to complete post-project restoration work. During this time period, the Forest Service has also granted extensions as allowable under the terms of its timber sale contracts. The Forest Service knows of no science indicating that these actions have adversely impacted the recovery of the NCDE grizzly bear population.

The primary concern regarding developed recreation sites is not fragmentation but rather the potential for bear mortality or removal as a consequence of habituation and food conditioning (Gunther et al., 2004). The action alternatives include a requirement that food/attractant storage orders be in place, including in zone 1 and zone 2. As stated in the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013),

One of the most effective ways to prevent grizzly bear/human conflicts and increase grizzly bear survival on public lands is to require users and recreationists in grizzly habitat to store their food, garbage, and other bear attractants so that they are inaccessible to bears. Securing potential attractants can prevent bears from becoming food conditioned and displaying subsequent unacceptable aggressive behavior. Storing attractants in a manner that prevents bears from accessing them is effective in limiting grizzly bear mortality, grizzly bear/human encounters, and grizzly bear/human conflicts. (p. 17)

In response to the comment about removing the no surface occupancy stipulation on the Helena National Forest under alternative 2, after further consideration, alternative 2 modified now includes standard NCDE-STD-MIN-08 requiring a no surface occupancy stipulation for new

leases in the primary conservation area, including the portion of the primary conservation area that is on the Helena National Forest.

7. The statement “Under the no-action alternative, within the recovery zone a number of regulations and practices related to livestock allotments have been and would continue to be implemented” was meant to point out that the current forest plan standards and guidelines and routine management practices would continue under this alternative. This intent has been clarified in sections 6. 5.5 “Grizzly bear” and 6.15.4 “Livestock grazing” of the final EIS.

8. The cumulative impacts of project activities and temporary use of roads along with housing development, bear mortality on private lands, climate change, and increasing recreation use are discussed for the entire NCDE in the final EIS, section 6.5.5 “Grizzly bear.” See also the comments and responses under Climate Change—Grizzly Bears.

As explained in the grizzly bear section of the final EIS, prior to the spread of white pine blister rust, grizzlies in the NCDE fed on whitebark pine seeds from late summer through fall, when and where they were available (Aune & Kasworm, 1989; Kendall & Arno, 1990; Mace & Jonkel, 1986; Shaffer, 1971). However, data on whitebark pine mortality rates from the early to mid-1990s indicated that 42-58 percent of all whitebark pine trees surveyed within the NCDE were dead (Kendall & Keane, 2001) and no longer were producing seeds. Recent remeasurement of a subset of the 1990s plots showed that the mortality of whitebark pine trees has more than doubled in the past two decades. Despite this loss, the grizzly bear population is increasing, illustrating the flexibility of grizzly bear diets and the high habitat diversity in the NCDE (USFWS, 2013). The Forest Service knows of no science indicating that conflict rates, reproductive success, or litter sizes for the NCDE grizzly bear population have been impacted by whitebark pine losses. See also the comments and responses under Grizzly Bear Conservation Strategy—Vegetation Management.

Regarding effective connectivity for wildlife populations across the Crown of the Continent region, see the comments and responses under Wildlife—Modeling and Managing Connectivity.

9. The final EIS has a section for each wildlife species that is called key indicators for analysis, and this section includes a table of indicators for the grizzly bear. Table 6 in chapter 2 of the final EIS has a table comparing the alternatives for the Flathead’s forest plan. Appendix 2 to the amendment record of decision is a direct comparison of the alternatives for the amendment forests.

Grizzly Bear—Food Storage Restrictions

Comment (letter numbers 2574, 2889, 2985)

The Forest Service’s food storage orders should apply to all users, and the agency should not have special requirements or a higher standard for contractors or permittees.

Response

The Forest Service’s food/wildlife attractant storage orders apply to all users on NFS lands. Under the action alternatives, NCDE-STD-WL-02 (FW-STD-WL-02 for the Flathead National Forest) would require that a food-attractant storage order be in place on NFS lands within the primary conservation area, zone 1 and zone 2. NCDE-GDL-WL-01 (FW-GDL-WL-01 for the Flathead National Forest) states that permittees, lessees, operators, and their employees should be informed of food/wildlife attractant storage special orders prior to beginning work or the turnout

of livestock. This guideline will assist the Forest Service with education and enforcement and will help to ensure that contractors and permittees are aware of the requirements that apply to all Forest users.

Grizzly Bear—Forest Plan Components

Comment (letter numbers 108, 117, 194, 306, 2575, 2809, 2816, 2875, 2879, 2889, 2904, 2940, 2984, 3005)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

Commenters expressed general support for adopting alternative C/alternative 3, adopting alternative 2/alternative B, or continuing current Flathead forest plan direction—alternative A. Many commenters also suggested specific changes to strengthen the standards and guidelines to sustain the grizzly bear population and promote connectivity and/or recommended extending primary conservation area standards and guidelines to zone 1, demographic connectivity areas, zone 2, and/or zone 3.

1. Clarify FW-STD-WL-01/NCDE-STD-WL-01, which states that grizzly bear habitat on NFS lands in the NCDE shall be delineated and managed as the primary conservation area, zone 1 (including the Salish demographic connectivity area and the Ninemile demographic connectivity area), zone 2, or zone 3.
2. Although the draft NCDE Grizzly Bear Conservation Strategy's standard no. 3 states that independent female mortality will not exceed 10 percent (USFWS, 2013, pp. 38-39), it contains no timely consequences for doing so.
3. An additional standard prohibiting firearms and requiring personnel to carry bear spray during vegetation management operations should be added.
4. There should be a desired condition to restore a metapopulation of grizzly bears in the Northern Rockies or to provide for functional connectivity from the NCDE to the Greater Yellowstone Ecosystem.
5. GDL-WL-03 should be more stringent and should read “. . . the use of clover is prohibited. Native seed mixes are required to be used so that seeded areas do not become an attractant.”
6. NCDE-STD-AR-01 for the administrative use of roads should be removed or should set a limit on the number of trips per day within the 30-day window.
7. The Forest Service should clarify the basis for allowing a temporary increase in open motorized route density and total motorized route density and a temporary decrease in secure core (NCDE-STD-AR-03). The draft Grizzly Bear Conservation Strategy (USFWS, 2013) considers as secure core all areas right up to the edge of open roads and motorized trails, but the Forest Service should buffer them. After a project has occurred in an area, no new projects—regardless of whether they would require temporary changes in open motorized route density, total motorized route density, or secure core—should be considered for 20 years.
8. Standard FW-STD-IFS-04/NCDE-STD-AR-04 allows for temporarily opening motorized access in the primary conservation area for activities such as cutting firewood. Under alternative 3/alternative C, the standard should be modified so that temporary motorized access is not

allowable in the primary conservation area, zone 1, or the demographic connectivity areas. The proposed temporary opening of roads for firewood gathering should also not be allowed in the zone 1 and zone 2 portion of the Helena National Forest that is west of Interstate 15.

9. Guidelines FW-GDL-IFS-01 and 02 should be expanded to include, at a minimum, the Salish demographic connectivity area. Guidelines NCDE-GDL-AR-01 and 02 should be expanded to include, at a minimum, the Salish and Ninemile demographic connectivity areas and the portion of zone 1 and zone 2 on the Helena National Forest that is west of Interstate 15.

10. Guidelines NCDE-GDL-AR-01 and 02 should be modified so that if the five-year time limitation is to be exceeded, or if the one-year time limitation for restoration of open motorized route density, total motorized route density, and secure core is to be exceeded, consultation with USFWS shall be required and additional mitigation measures enacted. FW-GDL-IFS-02/NCDE-GDL-AR-02 should be changed to a standard.

11. Plan components NCDE-DC-AR-02 and NCDE-STD-AR-05/FW-STD-REC-01 should clarify what “one increase” means and should restrict the type, scope, and scale of acceptable development allowed.

12. Trailheads should not allow for unintended overnight use; otherwise, trailheads need to be included in the limit of one development per 10 years. High-intensity nonmotorized trails should not be dropped from having an impact on grizzly bear security.

13. The vegetation management standards and guidelines that are developed for the NCDE’s primary conservation area should be applied equally in the Salish demographic connectivity area. NCDE-DC-VEG-01 and 02/FW-DC-TE&V 01 and 02 should clarify the desired amount and patterns of openings.

14. Alternative 2 should be modified to add the desired conditions NCDE- KNF Zone 1-DC-02, NCDE-HNF Zone 1&2-DC-02, and NCDE-LNF Zone 1-DC-02 from alternative 3 for the Kootenai, Helena, and Lolo National Forests, respectively.

15. Plan components FW-DC-REC-01 through 02 and 06; FW-STD-REC-01 and 02; FW-GDL-REC-01 and 02; FW-DC-IFS-01; FW-STD-IFS-01 through 04; FW-GDL-IFS-01 and 02; NCDE-DC-AR-01 through 03; NCDE-STD-AR-01 through 06; and NCDE-GDL-AR-01 through 04 should be extended into zone 1 and the demographic connectivity areas in a modified alternative 3/alternative C.

16. The Forest Service should clarify how the desired condition GA-SM-DC-01 to provide habitat that can be used by female grizzly bears and allow for bear movement can be achieved, given the high road densities in the Salish Mountains geographic area and Salish demographic connectivity area.

17. Desired conditions, standards, and guidelines are needed for zones 2 and 3 to provide connectivity to the Greater Yellowstone Ecosystem. Additional habitat standards and protections should be added for the Big Belt and Little Belt Mountain ranges to achieve functional connectivity between the grizzly bear populations in the NCDE and the Greater Yellowstone Ecosystem.

Response

1. Under the action alternatives, standard FW-STD-WL-01/NCDE-STD-WL-01 is needed to replace existing forest plan standards that designated management situations within the NCDE recovery area. The management zones identified in the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) would be adopted, as shown in figure 1-70.
2. A standard relative to annual independent female mortality is not part of the forest plan revision or amendments. The draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) includes provisions for a management review if there is a departure from any of the demographic standards (p. 39). The procedures and timeline requirements are given on pp. 107-108.
3. The Forest Service provides information about the use and benefits of bear spray to contractors, permittees, lessees, operators, and visitors of NFS lands, and NCDE-GDL-WL-01/FW-GDL-WL-01 would ensure that such information continues to be made available. The Forest Service does not have the authority to prevent private citizens from carrying firearms that are legally in their possession.
4. The action alternatives include desired condition NCDE-DC-WL-02, which states: “Within the NCDE primary conservation area and zone 1 (including the Salish demographic connectivity area and the Ninemile demographic connectivity area), grizzly bear habitat on National Forest System lands contributes to sustaining recovery of the grizzly bear population in the NCDE and contributes to connectivity with neighboring grizzly bear recovery zones.” By itself, the Forest Service cannot provide functional connectivity to the Greater Yellowstone Ecosystem because NFS lands comprise less than 25 percent of the lands within zone 2. By recognizing and providing plan components for the demographic connectivity areas and areas that could provide for genetic connectivity to the Greater Yellowstone Ecosystem, the Forest Service is taking appropriate steps within its authority that are consistent with the Grizzly Bear Recovery Plan (USFWS, 1993) and the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013).
5. The wording of guideline NCDE-GDL-WL-03 regarding seed mixes was deliberate to provide the flexibility that may be necessary to accommodate seed availability, budget constraints, or other implementation considerations. A guideline must be followed unless its intent can be met using other means (see 36 CFR 219.7(e)(1)(iv)).
6. Under alternative A/alternative 1, current operating procedures would continue that allow motorized administrative use of restricted roads as long as it does not exceed one to six vehicles per week or one 30-day time period during the non-denning season. Allowing administrative use enables the agency to conduct essential work. It is acknowledged in the effects analysis in the final EIS and in the biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017) that administrative use may have some impact by disturbing bears in the affected area, but this effect is anticipated to be minor, based upon the findings of Northrup and others (2012). These authors found that bears selected areas near roads traveled by fewer than 20 vehicles per day (140 vehicles per week) and were more likely to cross these roads. Bears showed avoidance of roads receiving moderate traffic (defined as 20-100 vehicles per day) and strongly avoided high-use roads (defined as greater than 100 vehicles per day) at all times (Northrup et al., 2012). Additionally, the Forest Service does not anticipate that the risk of human-caused mortality would increase as a result of administrative use because of the controls the agency has over its own employees and other authorized users.
7. Regarding temporary changes in open motorized route density, total motorized route density, and secure core, see the comments and responses under Grizzly Bear—Road Density and Security Core Habitat. Secure core does account for a 500-meter buffer of motorized roads and

trails; see definition of secure core (grizzly bear) in glossary. Also see the comments and responses under Best Available Scientific Information—Amendment 19. The original concept of a 10-year rest period for secure habitat was based upon a theoretical calculation to give a generation of bears a time period without temporary disturbance (from the time a female bear is born to its first litter (six years) and then raising offspring to 2½ years old). This rest period was recommended at a time when the grizzly bear population was much smaller and standards for secure core habitat were being formulated but were not yet in place. Grizzly bear experts no longer believe a rest period is necessary for continued bear recovery because secure core is now in place, and they expect that the temporary decrease in secure core allowed under standard NCDE-STD-AR-03 will support the recovery of the grizzly bear population (R. Mace, T. Manley, and C. Servheen, personal communication, June 18, 2015 meeting; (USDA, 2015a)). There is no scientific information indicating that a rest period is needed; this alternative is addressed in section 5.6.5 of the final EIS, “Alternatives considered but eliminated from detailed study.”

8. After reviewing public comments expressing concern about temporarily opening roads for activities such as firewood gathering, the Forest Service clarified in the final EIS that temporary public use of restricted roads would be allowed in the primary conservation area but not in secure core under any of the action alternatives. Such temporary use would be allowed in zone 1, the demographic connectivity areas, and zone 2. The analysis of the potential effects of this activity on grizzly bears is disclosed in sections 3.7.5 and 6.5.5, subsection “Grizzly bear,” of the final EIS. The alternative that would not allow this activity was considered but eliminated from detailed study, with rationale provided in the final EIS, section 5.6.5. Monitoring of the grizzly bear population, including mortality, will continue so that adjustments can be made if the best available scientific information indicates change is needed.

9. FW-GDL-IFS-01/NCDE-GDL-AR-01 state that projects should be designed so that on-the-ground implementation would not exceed five years in each bear management subunit in the primary conservation area to avoid disturbance or displacement of grizzly bears; FW-GDL-IFS-02/NCDE-GDL-AR-02 provides for restoring pre-project levels of secure core, open motorized access density, and total motorized access density within one year of completion of the project. The objective for the demographic connectivity areas is to support female occupancy, but it is expected that bears will occur at a lower density and habitat protections will not be the same as for the primary conservation area. The draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) proposed that habitat protections in the demographic connectivity areas would focus on limiting miles of open roads and maintaining the current inventoried roadless areas as stepping stones to other recovery zones. The action alternatives would provide these conditions. The objective for zone 2 is to provide the opportunity for movement of grizzly bears between ecosystems, with management emphasis on preventing and responding to conflicts. The action alternatives provide additional plan components concerning food storage, land ownership consolidation and conservation easements, the density of open roads, and the monitoring of grizzly bear-livestock conflicts in zone 2, but limits on the duration of activities are not needed to meet the objective of providing genetic connectivity. See also the comments and responses under Best Available Scientific Information—Amendment 19 and Grizzly Bear—Habitat Security.

10. In accordance with the Endangered Species Act section 7 regulations on interagency cooperation (50 CFR 402), the Forest Service evaluates the potential effects of its actions on listed species and critical habitat and initiates consultation when appropriate. In past consultations with the USFWS, Forest Service timber harvest projects have received biological opinions that included terms and conditions to avoid or minimize incidental take and that allowed one year to complete post-project restoration work. Consultations also have granted the Forest Service time

extensions as allowable under the terms of its timber sale contracts. The Forest Service knows of no science indicating that these actions have impacted the recovery of the NCDE grizzly bear population, and therefore the Forest Service does not believe that additional mitigation measures are required. If the grizzly bear is delisted in the future, the Forest Service will no longer consult with the USFWS. However, as stated in the draft NCDE Grizzly Bear Conservation Strategy, monitoring results would be reported to the NCDE Coordinating Committee. For details see the record of decision for the amendments and chapter 5 of the Flathead's revised forest plan (NCDE grizzly bear monitoring items and "Monitoring Scale and Responsibility").

Guidelines FW-GDL-IFS-02/NCDE-GDL-AR-02 state that in the primary conservation area, secure core, open motorized route density, and total motorized route density should be restored to pre-project levels within one year of completion of the project. The commenter expressed concern that this will not be completed because it is a guideline. As explained in chapter 1 of the forest plan in the "Plan components; guidelines" section, a guideline must be followed unless its intent can be met using other means (36 CFR 219.7(e)(1)(iv)). It is necessary to write this forest plan component as a guideline because timber sale contracts provide for extensions under specific circumstances. See also the comments and responses under Grizzly Bear—Road Density and Security Core Habitat.

11. Because of the wide variation in the type, scope, and scale of developed recreation sites, as well as the crucial importance of their location on the landscape, the Forest Service was unable to be more specific in defining "one increase" in the number or capacity of developed recreation sites per decade in this programmatic document. As required by NEPA, additional site-specific analysis will occur as projects are proposed. See also the comments and responses under Grizzly Bear—Impacts of Humans.

12. The wording of standard NCDE-STD-AR-05 specifies that it applies to developed recreation sites that are designed and managed for overnight use. As explained in the final EIS in section 6.5.5, sites receiving regular overnight use are more likely to have food and other bear attractants that increase the risk of grizzly bear-human conflicts. Although high-intensity nonmotorized trails would no longer be included when identifying secure core, their impacts on bears is still considered. The impacts of high intensity non-motorized trails were addressed separately in the grizzly bear effects analysis in sections 3.7.5 and 6.5.5 of the final EIS. Also see the comments and responses under Grizzly Bear—Impacts of Motorized and Nonmotorized Recreation.

13. Extending the vegetation management guidelines to the demographic connectivity areas is analyzed under alternative 3/alternative C in the grizzly bear effects analysis in sections 3.7.5 and 6.5.5 of the final EIS. See also the comments and responses under Grizzly Bear Conservation Strategy—Vegetation Management.

14. The Forest Service agrees that adding the desired condition statement NCDE- KNF Zone 1-DC-02, NCDE-HNF Zone 1&2-DC-02, and NCDE-LNF Zone 1-DC-02 is appropriate under all action alternatives, and alternative 2 modified has been changed as suggested.

15. This alternative(s) to extend plan components for motorized routes and developed recreation sites to zone 1 and the demographic connectivity areas was considered but eliminated from detailed study. The rationale is provided in the final EIS, section 5.6.5. See also Grizzly Bear—Impacts of Motorized and Nonmotorized Recreation and Grizzly Bear Conservation Strategy—Demographic Connectivity Areas.

16. The Salish demographic connectivity area boundary was delineated by the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013). The location of the boundary was based primarily on evidence of grizzly bear occupancy and compatibility with existing land uses. Thus, the intent was to follow the existing Tobacco bears outside of recovery zone line as much as possible. The land north of the Salish demographic connectivity area on the Kootenai National Forest is located along the reservoir and is heavily used for recreation. The area to the south of the Salish demographic connectivity area on the Flathead National Forest lacked strong evidence of use by grizzly bears. Regarding road densities in the Salish Mountains geographic area/demographic connectivity area, see the comments and responses under Grizzly Bear Conservation Strategy—Connectivity, and Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest.

17. The intent for zone 2 is to provide the opportunity for grizzly bears to move between the NCDE and adjacent ecosystems; however, zone 3 was not designed to lead to other suitable habitat or recovery areas (USFWS, 2013, p. iv). National Forest System lands comprise less than 25 percent of zone 2 and less than 9 percent of zone 3. The existing forest plan direction for zone 2 and zone 3 does not specifically address grizzly bears but does provide numerous standards to benefit wildlife or other resources that would also benefit grizzly bears. The draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) stated that existing management direction on lands managed by the Forest Service and the Bureau of Land Management has not precluded male grizzly bears from occupying zone 2, so existing direction should continue to apply. Since zone 3 does not have an objective for grizzly bear occupancy, no habitat standards were proposed. Therefore, the action alternatives did not propose any changes to existing forest plan direction for zones 2 or 3. The rationale for adding habitat standards for the portion of the Helena National Forest that is west of Interstate 15 and not for the Big Belt and Little Belt Mountains is provided in the final EIS, section 5.6.5, “Alternatives considered but eliminated from detailed study.” The Forest Service has added to the planning record an updated summary of the existing plan direction in zones 2 and 3 that may be beneficial to the grizzly bear (Warren, 2017).

See also the comments and responses under Best Available Scientific Information—Grizzly Bear, Grizzly—Draft EIS Analysis, and Best Available Scientific Information—Grizzly Bear.

Grizzly Bear—Gene Pool and Connectivity

Comment (letter numbers 306, 2816, 2940, 3204, 3205, 3213)

The Forest Service should identify a genetic connectivity area that extends through the entire Continental Divide region of the Helena National Forest through the Beaverhead-Deerlodge National Forest to the Greater Yellowstone distinct population segment and provide increased habitat protections that ensure grizzly bear connectivity between the NCDE and Greater Yellowstone Ecosystem populations.

The Forest Service should consider promoting genetic connectivity from the Big Belts through the Bridger Mountains to the Yellowstone distinct population segment.

The Forest Service should increase habitat protections by adding a desired condition to promote male occupancy.

The Forest Service should add standards limiting road density and allowing no net increase in roads open to public motorized use on NFS lands in zone 2 or the genetic connectivity area.

The Forest Service should add a standard to limit site development to no more than one per decade in zone 2 or the genetic connectivity area.

The Forest Service should extend the desired conditions, standards, and guidelines for livestock grazing in the primary conservation area and zone 1 to zone 2 or the genetic connectivity area.

Response

Alternatives 2 and 3 propose plan components for zone 1 and the portion of zone 2 west of Interstate 15 on the Helena National Forest that specifically address providing the opportunity for movement of bears to provide genetic connectivity with the Greater Yellowstone Ecosystem. The final EIS explains that available information shows that, to date, most grizzly bears have been moving south from the NCDE through the west side of the Helena National Forest rather than through the Big Belt or Little Belt Mountains to the east.

The Beaverhead-Deerlodge National Forest does not have any lands within the NCDE primary conservation area, zone 1, or zone 3. Portions of the Boulder River and Jefferson River landscapes were identified as zone 2. In zone 2, the emphasis is on conflict prevention and response, with food/wildlife attractant storage rules implemented on most Federal and State lands. Because the draft NCDE Grizzly Bear Conservation Strategy recommended that existing resource management direction and opportunities be maintained in zone 2, there is no need to amend the Beaverhead-Deerlodge National forest plan. Additional information has been added to the final EIS that discusses the existing management direction and assesses its compatibility with the forest plan direction in the Helena forest plan to provide for genetic connectivity from the NCDE to the Greater Yellowstone Ecosystem.

Both male and female bears are already known to occur in zone 2, but bear occupancy in zone 2 is not necessary to sustain the NCDE population. The objective is not continual occupancy, as it is in the primary conservation area, but rather the support of a few bears moving through and into other recovery areas, including the Greater Yellowstone Ecosystem. Extending plan components developed for the primary conservation area or zone 1 to zone 2 is not needed to meet the grizzly bear population objective for zone 2.

Section 5.6.5 of the final EIS discusses alternatives considered but eliminated from detailed study. These include (1) identify an additional demographic connectivity area on the Helena National Forest, (2) identify additional demographic connectivity areas/habitat protection zones in the Big Belt and Little Belt Mountains, (3) apply primary conservation area habitat standards and guidelines to zone 1, and (4) include the Beaverhead-Deerlodge National Forest in this decision.

Grizzly Bear—Habitat Connectivity

Comment (letter numbers 6, 108, 264, 306, 325, 2807, 2809, 2813, 2829, 2875, 2879, 2904, 2940, 3021, 3126, 3185, 3214, 3227, 3232, 3249, 3289)

The Forest Service should do more to provide for connectivity between the NCDE, Cabinet-Yaak, Greater Yellowstone, and potential future Bitterroot populations. The Flathead National Forest should also do more to provide for habitat linkage, specifically between the Swan and Mission Mountains and in the Coram area.

Response

The action alternatives for the Flathead's revised forest plan and the grizzly bear amendments propose adding specific forest plan components to provide for connectivity from the NCDE to the Cabinet-Yaak recovery area through the Salish demographic connectivity area, to the Bitterroot potential recovery area through the Ninemile demographic connectivity area, and to the Greater Yellowstone area through zone 1 and the portion of zone 2 that is west of Interstate 15. The effects of the alternatives with regard to connectivity between recovery areas are addressed in the final EIS and the biological assessments for the grizzly bear amendment and the revised Flathead forest plan (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017).

The 2015 Kootenai forest plan final EIS (USDA, 2013) and the wildlife habitat assessment (ERG, 2012) provide extensive analyses of connectivity (see the connectivity section and the individual species section for grizzly bear in the final EIS). The 2015 Kootenai forest plan addresses habitat management in the portions of both the Cabinet-Yaak and NCDE recovery areas that are within the Forest, and it also addresses access management within bears outside of recovery zone (BORZ) areas. The Tobacco bears outside of recovery zone polygon lies between the NCDE and the Cabinet-Yaak and encompasses essentially the same area as the Kootenai portion of the Salish demographic connectivity area. Forest plan direction for the Tobacco bears outside of recovery zone allows no increase in the total miles of open roads and total roads. The connectivity analysis included the contributions of wilderness areas and inventoried roadless areas and the mix of motorized versus nonmotorized management areas. In response to public comments regarding motorized use (Kootenai forest plan final EIS, appendix G, p. 512), the Forest explained that the roadless integrity of inventoried roadless areas would be maintained under the forest plan. The forestwide and geographic area connectivity direction in the Kootenai forest plan would provide for connectivity between inventoried roadless areas, and management area designations would not change the function of the inventoried roadless areas as security or connectivity habitat.

The Forest Service considered comments suggesting that an additional demographic connectivity area should be identified on the Helena National Forest to enhance connectivity between the NCDE and the Greater Yellowstone grizzly bear populations, but this alternative was eliminated from detailed study. As described in the Grizzly Bear Recovery Plan (USFWS, 1993) and the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013), there is a need to provide for the movement of bears, particularly male grizzlies, to provide genetic interchange between the NCDE and the Greater Yellowstone Ecosystem. Zone 2 was identified to address this need. The objective for zone 2 is different from the objective of a demographic connectivity area, which is to support occupancy by female bears between nearby recovery areas. This issue was discussed in the final EIS, and the rationale for not identifying a demographic connectivity area on the Helena National Forest is provided in section 5.6.5, subsection "Alternatives considered but eliminated from detailed study."

Regarding comments suggesting expanding the Ninemile demographic connectivity area to the south, see the comments and responses under Grizzly Bear Conservation Strategy—Lolo National Forest Amendment.

Refer to the comments and responses under Wildlife—Modeling and Managing Connectivity, Grizzly Bear Conservation Strategy—Connectivity and Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest regarding wildlife habitat connectivity in specific areas of the Flathead National Forest (including but not limited to the Swan Valley and Coram areas) and consideration of grizzly bear connectivity to neighboring national forests, Glacier National Park, and Canada.

Grizzly Bear—Habitat Security

Comment (letter numbers 44, 162, 179, 186, 229, 298, 312, 323, 2604, 2622, 2657, 2761, 2786, 2813, 2821, 2864, 2901, 3021)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Why does the Forest use the term “secure core” when referring to the action alternatives and “security core” when referring to alternative A?
2. The decisionmaker should select alternative C in combination with full implementation of amendment 19 (alternative A). The Flathead National Forest must move promptly to close and fully decommission 518 miles of system roads, and 57 miles of trails (mentioned on p. 38, vol. 2 of the draft EIS), and this work should be completed within the next 10 years.
3. The plan components for secure core should be written in a way that makes secure core permanent. Although alternative C appears to reflect the reductions made in the suitable timber base in the 2006 draft forest plan, it is not clear to what degree those reductions were intended to make some security core permanent or longer term than the 10-year minimum.

Response

1. Alternative A for the Flathead National Forest uses the term “security core.” The draft NCDE Grizzly Bear Conservation Strategy and the action alternatives for the Flathead National Forest plan revision and the amendment forests use the term “secure core” to make the distinction that high-use nonmotorized trails are not deducted from secure core under the action alternatives (also see the final EIS glossary).
2. The final EIS considers in detail both alternative A/alternative 1 and alternative C/alternative 3. The responsible official will be able to select either alternative, or any combination of alternatives, as the selected action. This could include a combination of alternatives A/alternative 1 and alternative C/alternative 3. The responsible official will carefully consider the mix of land and resource uses that will best meet public needs. Alternatives considered in detail provide a range of protections for watersheds, aquatic habitat and fisheries, wildlife habitat and species, and unroaded areas and also provide a broad range of opportunities for multiple uses such as recreation and timber production. The responsible official will consider all points of view in making his or her decision. The responsible official will strive for the appropriate mix and proper management of all resources, including what is needed to support continued recovery of the NCDE grizzly bear population while contributing to social and economic sustainability. The alternatives represent a range of possible management options to use in evaluating the comparative merits. Each alternative emphasizes specific land and resource uses and de-emphasizes other uses in response to the significant issues. For the revised Flathead forest plan, this was primarily done by changing management area allocations, allowing comparisons of the merits among the alternatives. There were some differences in plan components between alternatives, as indicated in the May 2016 draft forest plan and amendments.
3. With regard to making secure core permanent, the Flathead National Forest has about 1.7 million acres in secure core habitat, and permanent secure core exists in approximately 1.2 million acres of existing wilderness on the Forest. The forest plan includes about 190,000 additional acres of recommended wilderness (management area 1a), which could also be expected to provide secure core because this management area is not suitable for mechanized or motorized

use. Only about 9 percent of secure core is outside of wilderness, recommended wilderness, and inventoried roadless areas, so high levels of habitat security would continue to be maintained on most lands. Even on lands where temporary decreases in secure core may be allowed, there are limitations. The forest plan includes standard FW-STD-IFS-03, which would allow temporary changes within a bear management subunit up to a limit of a 2 percent decrease in secure core calculated by a 10-year running average. Guideline NCDE-GDL-IFS-01 states that projects should be designed so that implementation does not exceed five years and that pre-project conditions should be restored within one year of project completion (NCDE-GDL-IFS-02). These standards and guidelines considered the monitoring of past actions and scientific information regarding the average time it takes for a female grizzly bear to mature to an age where she can produce offspring and raise cubs. As stated in the draft grizzly bear conservation strategy, the average age of first reproduction in the NCDE is 5.4 years old but can vary from 3-8 years of age (Mace et al., 2012). The average time between litters in the NCDE is 3.0 years (Mace & Waller, 1998; C. C. Schwartz, Miller, & Haroldson, 2003). Thus, at a forestwide scale, a combination of permanent secure core and limitations on temporary reductions in secure core should meet the needs of the grizzly bear population.

Grizzly Bear—Hunting

Comment (letter numbers 6, 324, 900, 2888, 2905, 3202, 3255, 3289)

The hunting or trapping of grizzly bears should be allowed.

The hunting or trapping of grizzly bears should not be allowed.

The Forest Service should use its authority to control hunting on NFS lands, such as by prohibiting black bear hunting in the primary conservation area to reduce mistaken identity mortality of grizzly bears, and should work to reduce poaching and “defense of life” kills.

Response

The hunting or trapping of grizzly bears is currently prohibited and will continue to be prohibited as long as the species is listed under the Endangered Species Act. The forest plan components that contribute to conserving the NCDE grizzly bear population and its habitat will be implemented on NFS lands whether or not USFWS takes action to delist the population. The Forest Service provides public information and education about working and recreating in grizzly bear country and works cooperatively with MFWP’s bear specialists to help prevent grizzly bear-human conflicts and bear mortalities due to human causes such as mistaken identity, poaching, and defense of human life.

The purpose of the NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) is to provide a comprehensive and coordinated framework for maintaining a recovered grizzly bear population. The conservation strategy includes both demographic criteria aimed at maintaining a healthy, widely distributed and genetically diverse population, with high adult female survival and sustainable mortality limits, and habitat criteria aimed at providing habitat conditions within the primary conservation area that support continual occupancy by grizzly bears, supporting female occupancy and dispersal in demographic connectivity areas, and providing the opportunity for movement of grizzly bears, particularly males, through zone 2 to the Greater Yellowstone Ecosystem. All of the signatories to the conservation strategy will commit to use their authorities to sustain the NCDE grizzly bear population. This will include efforts to prevent grizzly bear-human conflicts, provide education and outreach, and assess any deviations from population or habitat standards of the conservation strategy. Because of this comprehensive interagency

approach, the Forest Service expects that MFWP will regulate any future hunting or trapping of grizzly bears in a manner that is consistent with the conservation strategy. Although the Forest Service has the authority to manage hunting on National Forest System lands, the agency does not anticipate needing to impose any separate regulations. The NCDE grizzly bear population will be monitored, and if the Forest Service determines that changes in habitat management direction are necessary, forest plans can be modified.

Grizzly Bear—Impacts of Humans

Comment (letter numbers 324, 2816, 2888, 2904, 2940)

The Forest Service should account for grizzly bear mortalities due to food/wildlife attractants and management removals. In addition to stepping up education and co-existence programs for homeowners and recreationists, USFS must also monitor and account for these ongoing threats, such as by tracking the numbers and locations of bear attractants and working to minimize conflicts.

The Forest Service should not allow any increase in developed recreation sites in the primary conservation area, should consider imposing reasonable limitations on the potential for large increases in developed recreation sites that could significantly impact grizzly bears in zone 1 and the Salish demographic connectivity area, and should limit the increase to a better-defined “one” site as a standard in zone 2.

The agency must consider the impact an increasing human population in the NCDE will have on grizzly bear habitat and recovery prospects in the future.

Response

The final EIS presents available information about sources of grizzly bear mortality. The action alternatives include a desired condition and a standard to ensure that food and wildlife attractants are properly stored on NFS lands. Montana Fish, Wildlife and Parks has been responsible for monitoring grizzly bear mortality across the NCDE and, as a signatory to the conservation strategy, it would continue to do so.

There have been no grizzly bear mortalities at developed recreation sites within the NCDE recovery area in recent years, although grizzly bear-human conflicts have occurred at some developed recreation sites. Most of the grizzly bears killed or removed by management agencies in the NCDE in the past had been involved in conflicts related to unsecured attractants such as garbage, bird feeders, pet/livestock feed, and human foods. Although the majority of these conflicts and mortalities occurred on private lands, developed recreation sites on public lands remain of concern. For this reason, the draft NCDE Grizzly Bear Conservation Strategy (USFWS 2013) concluded that it is important to limit increases in the number or capacity of developed recreation sites to levels that occurred during the period when the grizzly bear population was stable to increasing (USFWS, 2013). Because there is not a strong pattern of grizzly bear mortalities associated with developed recreation sites in the NCDE, the Conservation Strategy did not propose precluding any increases within the primary conservation area. The action alternatives would allow up to one increase in the number or capacity of developed recreation sites per bear management unit per decade, consistent with the recommendation in the Conservation Strategy. The Forest Service considered an alternative to not allow any increase in developed recreation sites but eliminated it from detailed study, as discussed in the final EIS, section 5.6.5. The draft Conservation Strategy (USFWS, 2013) did not consider it necessary to

constrain developed recreation sites in zone 1 or zone 2. The rationale for not analyzing this alternative in detail is also provided in the final EIS, section 5.6.5.

The potential impacts of the increasing human population in the NCDE area are acknowledged and analyzed in section of 6.5.5 the final EIS, subsection “Grizzly bear” cumulative effects.

Grizzly Bear—Impacts of Motorized and Nonmotorized Recreation

Comment (letter numbers 108, 162, 230, 319, 324, 2888, 2904, 3021)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest Service should analyze the potential impacts (displacement, grizzly bear-human conflicts) of nonmotorized high-intensity recreation uses such as hiking and mountain biking on grizzly bears and should continue to subtract these trails from secure core. Removing nonmotorized high-intensity-use trails from the secure core calculation means the impacts demonstrated by previous research will be ignored. The impacts are not zero.
2. The Forest Service should rigorously analyze bear attacks to determine whether certain recreationist behaviors exacerbate the risk. Mountain bikes present a higher risk, and any new trails should be designed for maximum sight distance and no banked corners.
3. The Forest Service should not allow any increase in the miles of motorized routes open to the public in the Salish and Ninemile demographic connectivity areas.
4. The Forest Service should emphasize quiet forms of recreation so grizzly bears can roam freely in the Swan Valley.

Response

1. In 1994 and 1998, the Interagency Grizzly Bear Committee task force charged with creating standard definitions and procedures for managing motorized access in grizzly bear recovery zones recommended that the impacts of “high intensity use” nonmotorized trails be considered in calculations of core habitat (IGBC, 1998, p. 4). As stated in the draft Grizzly Bear Conservation Strategy (USFWS, 2013, p. 21):

The original recommendation to exclude areas within 500 m. of high use nonmotorized trails from core area calculations was based on several untested assumptions regarding the potential impacts of such trails on grizzly bears. The approach is not clearly supported by the existing scientific literature. Multiple studies document displacement of individual grizzly bears from nonmotorized trails to varying degrees (Schallenberger and Jonkel 1980; Jope 1985; McLellan and Shackleton 1989; Kasworm and Manley 1990; Mace and Waller 1996; White et al. 1999). However, none of these studies documented increased mortality risk from foot or horse trails or population level impacts to grizzly bears from displacement. For example, while Mace and Waller (1996) found that grizzly bears were further than expected (i.e., displaced) from high-use trails (90 visitors/day) in the Swan Mountains, they reported there were no historic or recent records of grizzly bear/human conflict in their study area. Similarly, while grizzlies in Glacier National Park are displaced to some degree by nonmotorized trails (Jope 1985; White et al. 1999), conflicts and grizzly bear mortalities there are extremely low and related almost exclusively to campgrounds and other human-use areas. Furthermore, the recommendation that core

blocks be a minimum of 2,500 acres in size was based on research regarding road density . . . and did not address high intensity use nonmotorized trails in the analyses. While we recognize that displacement merits concern because it can affect individual grizzlies through habitat loss and disrupted foraging or social behaviors, there are no data demonstrating that these impacts translate into detectable impacts to population-level variables such as grizzly bear survival or reproduction. Until such effects are documented, our primary concern with high-use trails is whether or not they are strongly associated with grizzly bear mortality, as motorized routes are. At this point, there are no data or research indicating nonmotorized trail use results in disproportionate grizzly bear mortality or population declines.

The Forest Service has conducted additional review and has added new discussion, literature citations, and analysis of the impacts of nonmotorized recreation on grizzly bears to section 3.7.5 and 6.5.5 of the final EIS and in the biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017). Under the action alternatives, high-intensity-use nonmotorized trails would not be considered in the identification of secure core. In order to compare the alternatives, the Forest Service calculated the existing percentage of secure core both with and without nonmotorized, high-intensity-use trails for the action alternatives. Removal of high-intensity-use nonmotorized trails does not mean that the effects of nonmotorized trails would be ignored; the baseline is set depending on the definition used. As stated in the NCDE Grizzly Bear Conservation Strategy (USFWS, 2013), grizzly bear-human conflicts and mortalities will be monitored and reported annually. Forest plans are to be adaptive; they can be changed in the future if needed. The discussion of effects in the final EIS is based upon the best available scientific information.

2. Various studies have shown that activities where people may be moving quickly and/or quietly enough to surprise a bear before the bear detects them is an important factor in increasing the risk of sudden encounters. This can include activities such as mountain biking (if cyclists are traveling quietly at high speed) or hiking while hunting (if an individual is moving quietly through the forest or is in close proximity to an animal carcass). Strategies recommended to reduce the risk of sudden encounters include visitor education regarding safe practices in bear country and the proper use of bear deterrent spray, managing recreation to occur predictably in space and time, and designing and locating recreational trails to avoid habitats with concentrated bear food resources (Fortin et al., 2016; Herrero & Herrero, 2000; Quinn & Chernoff, 2010).

Grizzly bear expert Chris Servheen reported that there have been eight fatal grizzly bear attacks on humans in the lower 48 states since 2001 (Servheen, 2017). Of these, six occurred in the Yellowstone Ecosystem and two occurred in the Northern Continental Divide Ecosystem. Human behaviors at the time of the attacks involved hunting, camping, hiking, and mountain biking. Five of the fatalities involved lone individuals, and four of these were lone hikers. Bear spray was not carried or used by any of the people killed in these attacks. When grizzly bear-human conflicts do occur in the NCDE (whether associated with nonmotorized trail use, off-trail backcountry use, in developed recreation sites, or on private or other agency lands), MFWP, in cooperation with land management agencies and the USFWS, monitors the conflict situation and determines the appropriate conflict response based on the established Interagency Grizzly Bear Guidelines (IGBC, 1986). Educating people about how to avoid sudden encounters and the proper use of bear deterrent spray in the event of an encounter is also key to protecting both people and bears.

Because the Flathead's forest plan includes focused recreation areas (management area 7) and some of these areas have an objective to construct new nonmotorized trails, the forest plan for the

Flathead National Forest includes guideline FW-GDL-IFS-15, which provides management direction for trails and USFS education of trail users.

3. The action alternatives for the revised forest plan and amendments already include a standard for the demographic connectivity areas that allows no increases in motorized routes open to the public. This is measured as the density of motorized routes in the Salish demographic connectivity area on the Flathead National Forest (GA-SM-STD-01) and in the Ninemile demographic connectivity area on the Lolo National Forest (NCDE-LNF Zone 1-STD-01). On the Kootenai National Forest, to maintain consistency with established requirements for the Cabinet-Yaak Ecosystem, it is measured as permanent linear miles of open roads, total roads, or motorized trails in the Salish demographic connectivity area (NCDE-KNF Zone 1-STD-01). For more on the impacts of motorized uses, see the comments and responses under Grizzly Bear—Road Density and Security Core Habitat, Best Available Scientific information—Amendment 19, and Grizzly Bear—Support for Amendment 19 Standards.

4. The Forest considered a variety of alternatives, including those with management areas that emphasize nonmotorized recreation. See also the comments and responses under Grizzly Bear—Protection, Grizzly Bear Conservation Strategy—Range of Alternatives, and Alternative C—With Modifications.

Grizzly Bear—Mapping

Comment (letter number 108)

The Forest Service should provide a map that illustrates the relationship between the NCDE, Cabinet-Yaak, Bitterroot, and Greater Yellowstone Ecosystem recovery areas and discuss where connectivity will be emphasized or even prioritized.

Response

Maps were provided in the draft EIS to depict the grizzly bear recovery areas and where connectivity would be emphasized and are also included in the final EIS. Figures 1-76 and 1-78 in appendix 1 of the final EIS show the locations of the Salish and Ninemile demographic connectivity areas, which is where connectivity to the Cabinet-Yaak recovery area and Bitterroot evaluation area will be emphasized. Figure 1-72 shows the Blackfoot and Continental Divide landscapes on the Helena National Forest where additional plan components would be added under the action alternatives to provide emphasis for genetic connectivity to the Greater Yellowstone recovery area. In addition, references with page numbers to the maps contained in the Grizzly Bear Recovery Plan (USFWS, 1993) and the five-year status review (USFWS, 2011) have been added to the final EIS in section 6.5.5, Affected environment.

Grizzly Bear—Over-Snow Vehicle Use and Impacts to Den Sites

Comment (letter numbers 59, 108, 324, 2807, 2816, 2869, 2888, 2904, 0940, 3005, 3021)

The Forest Service should keep NCDE-STD-AR-08 and alternative C, which eliminates late season over-snow vehicle use in certain areas of the Flathead National Forest.

The Forest Service should adopt plan components that allow no increase above the baseline in late season over-snow vehicle use to protect bears during the den emergence period, not only in the primary conservation area but also in zone 1 and the demographic connectivity areas; or in all modeled denning habitat; or anywhere in the Forest.

The Forest Service should eliminate all late-season snowmobile access in occupied denning habitat.

An MFWP official at the April 2015 NCDE Grizzly Bear Subcommittee meeting in Choteau, Montana, displayed photos of snowmobile tracks illegally entering from the Skyland-Challenge play area and passing within less than 100 yards of a den site. This violation had gone undetected by Forest law enforcement officers, to the detriment of bears.

Response

In the draft EIS, a standard that would allow no net increase in motorized over-snow vehicle use on NFS lands during the den emergence time period was included in alternative 3/alternative C but not in alternative 2/alternative B. After review of public comments and further consideration, the wording of the standard was modified to improve clarity and standard NCDE-STD-AR-08/FW-STD-REC-05 was added to the preferred alternatives, 2 modified and B modified. Under all the action alternatives, the standard applies to modeled grizzly bear denning habitat in the NCDE primary conservation area.

As stated in the draft Grizzly Bear Conservation Strategy (USFWS, 2013) and the five-year review of the status of the grizzly bear (USFWS, 2011), there is no known or discernible impact from current levels of winter motorized recreation on the population of grizzly bears in the NCDE. The NCDE population is stable to increasing and has been expanding its distribution while existing levels of motorized over-snow vehicle use have been occurring. However, to reduce the potential for future increases in disturbance and adverse impacts on female grizzly bears with dependent offspring during the den emergence period, standard is included in the primary conservation area for all the action alternatives.

An alternative to eliminate all late-season motorized over-snow vehicle use across the Forests was considered but eliminated from detailed study (see final EIS, section 5.6.5). Extending the standard to zone 1, the demographic connectivity areas, or to all modeled denning habitat is not necessary to sustain the recovery of the population or provide connectivity with other ecosystems, so this alternative was also eliminated from detailed study. Because the locations of occupied dens are likely to change every year, eliminating late-season snowmobiling in occupied denning habitat or in the vicinity of maternal dens is not a feasible alternative.

Extending the dates defining the denning season was an alternative considered but eliminated from detailed study (see final EIS, section 5.6.5). The end dates of April 1 west of the Continental Divide and April 15 east of the Continental Divide are based upon information from more than 250 known grizzly bear dens in the NCDE (R. Mace, personal communication, 2014). The April 1 and April 15 dates are already conservative in providing protection to bears emerging from dens. For example, in 2015, which was a year with lower than average snowfall and early snowmelt, on the west side of the NCDE the first male emerged on April 23 and the first female emerged on April 28. In the future, if the best available information shows that grizzly bears are coming out of their dens at an earlier date, forest plans could be amended or revised if deemed necessary.

The draft record of decision for the Flathead's revised forest plan documents how the preferred alternative meets the minimization criteria of the travel management regulations. See also the comments and responses under Grizzly Bear—Support for Amendment 19 Standards.

Regarding the comment about the photograph of a grizzly bear den site and snowmobile tracks, MFWP did not observe a conflict between a grizzly bear and snowmobiles at this den site. The Flathead National Forest has cooperatively monitored den sites (detected by MFWP when they have transmitters on bears) and motorized over-snow vehicle use (Jacobs, 2016) and will continue to do so (see chapter 5 of the revised Flathead forest plan). The preferred alternative includes changes to areas and routes suitable for motorized over-snow vehicle use in the Skyland-Challenge area to assist law enforcement officers with enforcement in the future. Forest plans are intended to be adaptive and can be modified in the future if the best available scientific information indicates modifications are needed to sustain the recovery of the NCDE grizzly bear population.

Grizzly Bear—Portrayal of Alternative A and Amendment 19

Comment (letter numbers 43, 44, 73, 2904, 2910, 2989, 3062)

1. The Forest misconstrued the existing condition or alternative A in the draft EIS; this should be portrayed correctly in the final EIS. Volume 1, page 408 of the draft EIS states, “As of 2013, a total of about 711 miles of road had been decommissioned. . . . In order to fully meet amendment 19 (OMAD [open motorized route density], TMAD [total motorized route density] and security core), a total of approximately 518 miles of roads would need to be reclaimed, and either on the transportation system as impassable or off the transportation system as decommissioned (including about 400 miles of roads on lands acquired through the Legacy project).”

Decommissioning means that all bridges and culverts must be pulled and only fully decommissioned routes can be removed from the total motorized route density mileage list; intermittent stored service routes under all alternatives cannot be substituted for decommissioned routes and cannot be removed from total motorized route density miles; by stating that roads reclaimed under continued implementation of alternative A could be either left on the system as “impassable/stored” or removed from the system as decommissioned, the draft EIS does not adequately provide the full and fair disclosure of the no-action alternative that is required by NEPA.

2. In the draft EIS (vol. 1, p. 417), the Forest fails to reveal the most important of Ruby’s (2014) conclusions until the last sentence of this section. Note that former MFWP grizzly bear biologist Rick Mace expressed this same point to the NCDE Grizzly Bear Subcommittee on several occasions while reporting that female mortalities in the Swan Valley were excessive.

Response

1. In response to comments, the description of amendment 19 appendix TT is clarified in the final EIS section 3.7.5, subsection “Grizzly bear,” and the appendix TT definitions specific to alternative A are included in the final EIS glossary (see “road” and its subparts). Appendix TT uses the term “reclaimed.” It does not use the term “decommissioned,” nor does it say that a road must be removed from the Forest Service road system to meet the definition of a reclaimed road. As stated in the draft EIS, the Forest does not have complete knowledge of some of the roads it currently manages. In order to account for this uncertainty, the final EIS includes a table that compares the total motorized access density for alternative A, assuming that stream-aligned culverts are still in place on roads rather than assuming there are no stream-aligned culverts. The final EIS clarifies that the difference in assumptions makes a difference in the total motorized route density percentage for some grizzly bear subunits but does not change the on-the-ground condition for the grizzly bear. The roads in question have been determined to be impassable

because they are revegetated with tall vegetation, have had a bridge or large culvert removed, and/or have had the first portion of the road (typically 200 to 600 feet) treated in such a manner as to preclude its use as a motorized or nonmotorized travel way during the non-denning season. The EIS clarifies that if a road is impassable, it provides grizzly bear habitat security and is not counted in the total motorized route density for the action alternatives. For more details, see the USFS biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017), USFWS biological opinion (USFWS, 2017b), and the final EIS.

2. The final EIS includes Ruby's findings; whether it is in the last sentence in the paragraph or the first is not relevant. As explained in the grizzly bear section of the final EIS, Mace's findings show that mortality is not excessive because the grizzly bear population in the NCDE has been stable to increasing, its size is much larger than the previous estimates derived from sightings of females with young, the population occupies all NCDE bear management units, and mortality levels have allowed population growth even though grizzly bear mortality does occur in the Swan Valley. The primary causes of grizzly bear mortalities in the Swan Valley are discussed in Costello et al. (2016) and Manley (2017). As shown in Costello et al. (2016, figures 4.4.3 and 4.4.4 and p. 34), most of the mortalities in the South Fork Flathead River-Swan Valley mortality reporting subunit occurred in the Flathead and Swan Valleys, where most private lands are located. As explained by Manley (2017): "Fourteen of the 16 grizzly bear management captures [in 2016] occurred on private property. Two of the captures were on Department of Natural Resources and Conservation (DNRC) forest land, but the conflicts occurred on private lands" (p. 12).

As stated by Costello et al. (2016, p. 100), the NCDE grizzly bear population is numerically large compared to previous estimates, demographically healthy, and still growing, and some additional mortality would be sustainable. As stated in the draft NCDE Grizzly Bear Conservation Strategy, NCDE grizzly bear population parameters, including mortality, will be monitored and changes to management can be made, if needed.

Grizzly Bear—Protection

Comment (letter numbers 51, 306, 324, 2602, 2879, 2904, 2940, 2984, 2985, 3020, 3021, 3252)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The EIS must consider the effects on the grizzly bear population as a whole, not just the NCDE grizzly bear population, and must address the National Forest Management Act planning regulation applicable to the amendment forests to provide well-distributed habitat that will maintain a viable population.

2. The current 3 percent growth rate—which was achieved through Endangered Species Act protections and amendment 19—will not be possible after habitat standards are weakened and higher mortality thresholds and potentially hunting are allowed.

3. Male grizzlies, with their much larger home ranges than those of female grizzlies, are not being protected on the Flathead National Forest.

4. To ensure the recovery and sustained survival of the grizzly bear, USFWS and the Forest Service must consider zones 2 and 3 as secure habitat. The southern portion of Nevada Mountain where habitat currently supports a sow and cubs should not be in zone 2.

5. When protecting bear habitat, also consider the people who live, work, and play in the area, including motorized recreationists.
6. Tick-borne pathogens could harm grizzly bears, and the Forest Service should account for this threat.

Response

1. The habitat management direction being incorporated into the forest plans is intended to contribute to sustaining the recovery of the NCDE grizzly bear population within the primary conservation area and to contribute to connectivity with neighboring grizzly bear recovery zones through the demographic connectivity areas and zone 2. It does not address habitat management within the other recovery areas. The final EIS discusses the other recovery areas and the potential for the NCDE population to serve as a source population to the Cabinet-Yaak and Yellowstone populations and the Bitterroot potential recovery area. In response to this comment, some additional information has been incorporated into the final EIS section 6.5.5, “Grizzly bear, Affected environment” about the relationship between the NCDE and the other recovery areas.

The Grizzly Bear Recovery Plan includes the goal that reproductive females are documented in at least 21 of 23 bear management units at least every six years and that no two adjacent bear management units are unoccupied (USFWS, 1993). As stated in the final EIS, Costello et al. (2016) reported that during the most recent six-year period (2009-2014), all 23 bear management units were occupied by females with young during at least one of those six years, and the goal that no two adjacent bear management units would be unoccupied has been met every year since 2009. All of the alternatives will maintain a well-distributed population of bears across the primary conservation area. Furthermore, under the action alternatives, demographic connectivity areas would be established and purposefully managed to encourage connectivity to the Cabinet-Yaak and Bitterroot Ecosystems. Additionally, an area on the Helena National Forest would be identified for coordinated management that would support the movement of male bears to the Greater Yellowstone Ecosystem.

2. The approach taken in the forest plan revision and amendments, which is informed by the draft NCDE Grizzly Bear Conservation Strategy, is not to weaken habitat standards but rather to maintain the habitat conditions that were in place during the time that the population has been stable to increasing. Monitoring of the population will continue. Forest plans are intended to be adaptive and can be modified in the future if the best available scientific information indicates it is needed to sustain the recovery of the NCDE grizzly bear population. Regarding the potential for future hunting, see also the comments and responses under Grizzly Bear—Bear Hunting.

3. The final EIS, section 6.5.5, summarizes information about male and female grizzly bear home range size, movement and dispersal distances; sensitivity to motorized routes, highways, and human developments; and susceptibility to human-caused mortality. It is true that young male bears typically have higher mortality rates than other sex-age classes of bears. This is probably due to their propensity to move longer distances and to establish home ranges farther (18 to 26 miles) away from their mother’s home range, which is more likely to put them in contact with humans. Aside from the standards concerning secure core and late-season over-snow vehicle use that are specifically aimed at females with dependent young, the plan components are protective of both male and female bears.

4. The Grizzly Bear Recovery Plan (USFWS, 1993) states that each recovery zone includes an area large enough and of sufficient habitat quality to support a recovered population (p. 17). It is

recognized that grizzly bears will move and even reside permanently in areas outside recovery zones, but only the area inside the recovery zone is essential to recovery (p. 18). Criteria for a change in the recovery zone boundary to be made by the USFWS are set forth in the recovery plan on p. 18. As explained in the final EIS, zones 2 and 3 are managed for a different objective than the primary conservation area. An alternative to extend habitat protections from the primary conservation area to zones 2 and 3 was considered but eliminated from detailed study, as discussed in the final EIS section 5.6.5.

The forest plan amendments would not result in less habitat protection than currently exists in zones 2 and 3. For zone 2, the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) explained:

Because we know that management direction in current USFS [U.S. Forest Service] and BLM [Bureau of Land Management] land management plans in zone 2 did not preclude male grizzly bears from occupying this area in low densities, existing direction will continue to apply. Land management plans on lands managed by BLM or USFS contain numerous standards to benefit other species or resource values that will also benefit grizzly bears. Existing direction for USFS and BLM land management plans is summarized in appendices 10 and 11. (p. 91)

Similarly, for zone 3 the draft conservation strategy states:

There are no habitat standards specifically related to grizzly bears because zone 3 does not have a goal of grizzly bear occupancy. However, land management plans on the roughly 10 percent of zone 3 lands managed by the BLM or USFS contain numerous standards to benefit other species or resource values that will also benefit grizzly bears. (p. 92)

The summary of existing forest plan management direction for zones 2 and 3 of the analysis area that may benefit grizzly bears has been updated and documented in the planning record (Warren, 2017).

The Nevada Mountain Inventoried Roadless Area spans zones 1 and 2. The purpose of zone 1 is to provide a buffer area surrounding the primary conservation area within which female occupancy is supported and grizzly bear population data, including mortalities, are monitored; the purpose of zone 2 is to provide the opportunity for movement of bears to provide genetic connectivity from the NCDE to the Greater Yellowstone Ecosystem. The Nevada Mountain Inventoried Roadless Area will continue to be managed in accordance with the Forest Service 2001 Roadless Area Conservation Rule, which does afford a large block of secure habitat for grizzly bears. The expansion of the grizzly bear population into zone 2 is an indicator that population recovery is occurring.

5. The intent of the management direction under all of the alternatives is to consider ecological, social, and economic sustainability. The action alternatives have a number of desired condition statements that discuss this intent. These are two examples:

NCDE-DC-AR-01. Within the NCDE primary conservation area, motorized access provides for multiple uses (such as harvesting of timber and non-timber forest products; hunting, fishing, and recreation opportunities) on National Forest System lands while providing open motorized route density, total motorized route density, and secure core levels that contribute to sustaining a recovered grizzly bear population in the NCDE.

NCDE-DC-VEG-01. Within the NCDE primary conservation area, the amount, type and distribution of vegetation provides for ecological, social and economic sustainability of National Forest System lands, while providing habitat components that contribute to sustaining a recovered grizzly bear population in the NCDE.

In making the decision, the responsible official will strive for an appropriate mix and proper management of all resources, including what is needed to support the continued recovery of the NCDE grizzly bear population while contributing to social and economic sustainability.

6. The Forest Service is not aware of any scientific information indicating that tick-borne pathogens are a threat to grizzly bears. In its five-year status review, USFWS (2011) concluded that there is no evidence that parasites or disease are significant causes of natural mortality among grizzly bears. Monitoring will continue at MFWP's wildlife laboratory to determine causes of death and to obtain baseline information about diseases and parasites in grizzly bears.

Grizzly Bear—Road Density and Security Core Habitat

Comment (letter numbers 38, 42, 47, 54, 108, 179, 197, 200, 201, 228, 297, 306, 319, 324, 2552, 2574, 2576, 2583, 2610, 2630, 2809, 2816, 2828, 2840, 2875, 2879, 2888, 2892, 2904, 2940, 2984, 3005, 3021, 3028, 3070, 3081, 3097, 3288)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

Some commenters stated that the Flathead National Forest should maintain current road density and secure core standards (e.g., alternative A and amendment 19), some expressed support for some or all of the plan components in alternative C, and some suggested combining alternatives A and C. Some commenters were concerned about changes such as allowing temporary use of roads in the recovery zone/primary conservation area, and some said the Forest Service should consider decreasing road densities and providing secure core in zone 1 (including the demographic connectivity areas) and/or zone 2 on the amendment forests.

1. The Forest Service should finish implementing amendment 19 on the Flathead National Forest. The Forest should reclaim roads in secure core. There should be no open roads in secure core, and secure core should remain in place for 10 years.

2. The Forest should bring the new land acquisitions in the Swan Valley up to amendment 19 road density standards, abide by the Swan Valley Grizzly Bear Conservation Agreement, and create vital wildlife linkage zones by providing four wide and functional connectivity corridors across the Swan Valley and by other methods.

3. Alternatives A and C should be refined and combined to improve habitat protection by providing greater habitat security with the recommended wilderness connectivity, by precluding area use by mountain bikes and motor vehicles, by precluding area use by snowmobiles in the springtime where it is currently allowed, and by extending protections beyond inadequate recovery zones.

4. The final EIS should provide a comparison of alternatives that lists additional acres of security core and additional miles of road to be reclaimed.

5. The Forest Service should not relax grizzly bear protection by allowing temporary changes in open motorized route density, total motorized route density, and secure core, and project activities of five years or more; none of these are really “temporary.”
6. The administrative-use policy of three round trips per week or one 30-day unlimited use period during the non-denning season for each road closed to the public can have large impacts on grizzly bears and should not be continued.
7. The cumulative impacts of project activities and the temporary use of roads, along with housing development, bear mortality on private lands, climate change, increasing recreation use, etc., need to be analyzed.
8. The Forest Service should not allow temporary use by the public of a restricted road or a road in secure core. Modify FW-STD-IFS04/NCDE-STD-AR-04 to not allow public use of restricted roads in the primary conservation area, zone 1, or demographic connectivity areas.
9. With the increasing bear population, additional road closures are not needed.
10. Because information about the “old road system or the status of all roads on adjacent private lands” is incomplete, the Forest Service should strive to reduce road densities within the primary conservation area and demographic connectivity areas rather than just maintain status quo.
11. The Forest Service should continue to deduct nonmotorized high-intensity-use trails from security core.
12. The Forest Service should not rely on Boulanger and Stenhouse (2014) to justify the excessive route densities called for in zone 1, zone 2, and the demographic connectivity area.
13. All modeled or known denning habitat should be protected from over-snow motorized vehicle use in the spring, preferably starting March 1, given that bears are emerging from their dens earlier and earlier each year, likely as a result of climate change.

Response

1. Section 3.7.5 of the final EIS, “Environmental consequences of alternative A,” discloses effects of the continued implementation of amendment 19 on the Flathead National Forest, which include an estimate of additional routes to be closed to public motorized use (Ake, 2015). By definition, roads open to public motorized use do not occur in security core. The Forest has refined and clarified alternative A in the final EIS, with additional discussion of appendix TT and what it says about reclaimed roads and security core remaining in place for 10 years. As stated in the final EIS, section 3.7.5, “Grizzly bear,” the grizzly bear standards in the action alternatives require that baseline conditions are maintained. The 2011 baseline was selected because in that year the population size was estimated to be greater than 765 bears, more than double the existing estimate based on sightings of females with young (Kendall et al., 2009). Additionally, the recovery criteria for occupancy of bear management subunits had been met and the mortality limits had not been exceeded. Ongoing research and monitoring of the NCDE grizzly bear population indicates that it has been stable to increasing (Costello et al., 2016) and is expanding in distribution. Alternative B modified would incorporate management direction for grizzly bear habitat informed by the draft NCDE Grizzly Bear Conservation Strategy, including management direction for motorized access. It would maintain on-the-ground baseline conditions for motorized road access that contribute to the recovery of the grizzly bear population within the NCDE. The Forest’s revised forest plan includes some road management objectives that could

indirectly benefit grizzly bears, but it would not require new closures of roads or trails currently open to public motorized vehicle use. The revised forest plan does not continue the amendment 19 direction to increase habitat security to meet the 19 percent total motorized access density, 19 percent open motorized access density, and 68 percent security core. Although the Forest Service acknowledges that this direction has been beneficial to wildlife and aquatic habitat, the overall ecological conditions (both habitat and species populations) do not warrant additional access restrictions to improve grizzly bear habitat. Also see the comments and responses under Grizzly Bear—Protection, Grizzly Bear Conservation Strategy—Range of Alternatives, Alternative A, and Alternative C—With Modifications.

2. Under alternative A, the Flathead's revised forest plan does not have limitations on the duration of projects for 43 of the 54 bear management subunits where amendment 19 applies. As explained in section 3.7.5 of the final EIS, subsection "Grizzly bear," "Environmental consequences of alternative A," the Flathead National Forest adopted limitations on projects for 11 of the Forest's bear management subunits in the Swan Valley as a signatory to the Grizzly Bear Conservation Agreement, in cooperation with Plum Creek Timber Company and the Montana Department of Natural Resources and Conservation (Plum Creek et al., 1997). The parties to the agreement scheduled commercial timber harvest activities to concentrate this use in four out of the eleven bear management subunits on a rotational basis, leaving the other seven bear management subunits "inactive" during the non-denning season for a minimum of three years. "Commercial use" was defined as major forest management activities by Plum Creek Timber Company, the Forest Service, or Montana Department of Natural Resources and Conservation, including, without limitation, road construction, road reconstruction, and timber harvest but not salvage harvest. The agreement also addressed linkage areas in the Swan Valley. For alternative A, the final EIS discloses the anticipated effects of meeting 19 percent open motorized access density, 19 percent total motorized access density, and 68 percent security core in grizzly bear management subunits in the Swan Valley. As explained in the grizzly bear subsection of section 3.7.5 of the final EIS, conditions in the Swan Valley have now changed due to the Montana Legacy Project land acquisition, and therefore alternatives B, C, and D for the forest plan would change the grizzly bear management direction for the eleven Swan Valley bear management subunits. The forest plan has plan components for linkage areas in the Swan Valley. Also see the comments and responses under Wildlife—Modeling and Managing Connectivity and Wildlife—Forest Plan Components.

3. Section 3.7.5 of the final EIS, in the sections on the environmental consequences of alternatives A and C, discloses the effects of continued implementation of amendment 19 on the Flathead National Forest under the no-action alternative as well as the effects of alternative C. It is not necessary to separately analyze the effects of combining the two alternatives. In making the decision, the responsible official can select from any of the alternatives or a combination of alternatives, including the suggested combination of alternatives A and C. Under alternative B modified, recommended wilderness is not suitable for motorized and mechanized uses (including mountain bikes) and grizzly bear protections are provided beyond the recovery zone/primary conservation area. Section 2.4.6 of the final EIS, "Alternatives considered but eliminated from detailed study," includes a "No winter motorized recreation alternative."

4. In section 3.7.5 of the final EIS, subsection "Grizzly bear," "Environmental consequences of alternative A," the Forest estimated and disclosed the number of miles of additional roads and trails that would need to be closed to public motorized use to provide security core for continued implementation of alternative A, in compliance with appendix TT of the 1986 forest plan. Under

the action alternatives (B, C, and D), additional roads and trails would not need to be closed for the grizzly bear.

5. The draft NCDE Grizzly Bear Conservation Strategy uses the term “temporary” in the sense that roads are opened for the specific objective of completing a project and closed at its conclusion. This is in contrast to opening a road for an unspecified timeframe, which would then require a future project decision to close it. The draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) adopts an overall goal for habitat management on Federal lands to support continued recovery of the NCDE grizzly bear population while maintaining options for resource management activities. Road densities would be maintained at approximately the same levels that existed as of the 2011 baseline (p. 49). The draft NCDE conservation strategy presents information about baseline habitat conditions and management activities, including a discussion of temporary increases in open motorized route density and total motorized route density and temporary decreases in secure core to accommodate resource management projects on NFS lands to meet the multiple use mission of the Forest Service. The criteria for temporary changes were based on the duration of six projects on two national forests affecting 18 grizzly bear subunits that were analyzed by the draft Grizzly Bear Conservation Strategy (USFWS, 2013). These temporary changes occurred during 2003 to 2010, a period when the NCDE grizzly bear population was increasing (Costello et al., 2016; Kendall et al., 2009; Mace et al., 2012), indicating that such temporary changes were compatible with supporting the recovery of the NCDE grizzly bear population. The types of projects included timber harvest and road management. The temporary increase in open motorized route density and total motorized route density and the temporary decrease in secure core were incorporated into the action alternatives for the amendment forests and the revised forest plan for the Flathead National Forest. With the exception of some bear management subunits in the Swan Valley that have been subject to the Swan Valley Grizzly Bear Conservation Agreement, projects are not limited in duration in the current forest plans, so the action alternatives would not be relaxing protections.

With respect to the duration of projects, the revised forest plan and the amendments would not relax protections; to the contrary, they would limit the duration of projects in all NCDE bear management subunits. Under the action alternatives, guidelines would specify that projects should be designed so that implementation does not exceed five years (NCDE-GDL-IFS-01/NCDE-GDL-AR-01) and so that pre-project conditions would generally be restored within one year of project completion (NCDE-GDL-IFS-02/NCDE-GDL-AR-02). Based on past experience, this guidance is believed to be compatible with a stable to increasing grizzly bear population while allowing for proper sequencing of activities such as pre-harvest weed treatment and water quality best management practices on roads, timber harvest, post-harvest slash treatment, tree planting, and post-harvest road management. These plan and amendment components were written as guidelines because Forest Service contracts allow the extension of contract term lengths under specific conditions. As explained in chapter 5 of the revised forest plan for the Flathead National Forest, application of these guidelines would be monitored and reported. As stated in the purpose and need for the Flathead National Forest revised forest plan, the standards and guidelines related to motorized use have been clarified and/or modified based on 2012 planning rule requirements, what would be most effective in moving the Forest towards desired conditions (see final EIS sections 1.4, 1.4.1, and 1.4.2), and the results of the extensive monitoring of the NCDE grizzly bear population (see final EIS, section 3.7.5, “NCDE Grizzly bear population, distribution, and status”). Section 2.4.6 of the final EIS, “Alternatives considered but eliminated from detailed study,” discusses suggestions to reduce the duration of projects that would be allowed under alternatives B modified, C, and D.

6. Administrative use of roads does not have large impacts on the NCDE grizzly bear population (also see the comments and responses under Grizzly Bear—Forest Plan Components). Under alternative A on the Flathead National Forest, motorized administrative use of restricted roads has been allowed as long as it does not exceed one to six vehicles/week or one 30-day period during the non-denning season. Appendix TT of the 1986 forest plan states that if administrative use must exceed these low-intensity levels, reconsultation with USFWS will occur. With respect to the administrative use of closed roads, the revised forest plan and amendments would not relax protections. To the contrary, standards FW-STD-IFS-01 (Flathead National Forest) and FW-STD-AR-01 (amendment forests) would limit administrative use during the non-denning season in all NCDE bear management subunits.

7. The cumulative impacts of project activities and temporary use of roads, along with housing development, bear mortality on private lands, climate change, and increasing recreation use, are discussed for the entire NCDE in the final EIS, section 6.5.5, subsection “Grizzly bear.” Section 3.7.5 of the final EIS, subsection “Grizzly bear,” discusses the effects of changes in use of roads due to projects for the Flathead National Forest. Additional analysis was completed for the biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017) and the final EIS to evaluate the potential intensity and extent of effects to secure core by allowing temporary reductions. For example, this additional analysis shows that the Flathead National Forest has about 1.67 million acres of secure core habitat. Based upon the management areas for alternative B modified in the forest plan, only about 9 percent of secure core could have temporary use of closed roads for projects, for administrative use, or for public use. In addition, site-specific analysis of cumulative effects would occur as needed, at the time projects are proposed, to determine site-specific effects on the grizzly bear.

8. The suggestion to not allow any temporary changes, including the use of roads by the public, is addressed in the final EIS, section 2.4.6 and section 5.6.5, “Alternatives considered but eliminated from detailed study.” In the draft EIS, the standard addressing temporary public use of restricted roads in secure core varied between the action alternatives. In response to public comments, the Forest Service made a change in the final EIS to preclude temporary use of restricted roads in secure core under all action alternatives. This is consistent with the direction already in place for the Flathead National Forest and for the Kootenai forest plan in the bears outside of recovery zone areas. This direction has allowed the grizzly bear population to grow and expand its distribution beyond the objectives stated in the Grizzly Bear Recovery Plan (USFWS, 1993). The biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017) and sections 3.7.5 and 6.5.5 of the final EIS include a discussion of the effects of this management direction on grizzly bears.

9. The “Affected environment” subsections in sections 3.7.5 and 6.5.5 of the final EIS provide extensive review and references to peer-reviewed scientific literature that document the responses of grizzly bears to motorized access. To achieve the purpose and need, the Forest Service needs to incorporate management direction that will maintain habitat conditions that will support the continued recovery of the NCDE grizzly bear population. Under the action alternatives, the Flathead National Forest would not need to close additional roads, as is required under amendment 19.

10. The statement from the draft EIS that is referenced in the comment was pointing out that the Forest Service database is the best available information at this time but will be updated as new information is obtained. However, some information, such as data on roads under other

ownerships, may remain incomplete. Alternative A considers and displays the effects of further reducing road densities on NFS lands in the primary conservation area.

11. See the comments and responses under Grizzly Bear—Impacts of Motorized and Nonmotorized Recreation.

12. See the comments and responses under Best Available Scientific information—Amendment 19.

13. See the comments and responses under Grizzly Bear—Over-Snow Vehicle Use and Impacts to Den Sites.

Grizzly Bear—Support for Amendment 19 Standards

Comment (letter numbers 43, 44, 73, 2904, 2910, 2989, 3062)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

The draft EIS should include adequate rationale and discussion on moving away from amendment 19 and the potential effects on grizzly bears, including consideration of the ability of the NCDE population to contribute to the recovery of the species as a whole.

1. Alternative A and continued implementation of amendment 19 are beneficial, and the forest plan should continue securing promised grizzly bear habitat by closing hundreds of miles of unneeded roads, restoring the landscape, and reducing the suitable timber base and allowable sale quantity accordingly, as proposed in 2006. The gold standard for motorized route density and security core in the NCDE is amendment 19, which is based on the research of Mace and Waller (1997). The forest plan ignores the court ruling that amendment 19 continues to be a legally binding commitment and that its schedule of road closures, decommissioning, and reclamation must be completed. The Forest should put amendment 19 back into the forest plan.

2. The forest plan eliminates the road density and secure core standards that are in amendment 19 of the existing plan. The exceptions to the standards weaken amendment 19. These standards are necessary to make sure that grizzly bear populations do not decline, and they are also essential for elk and other wildlife. The Forest Service should recognize that amendment 19 dovetails with requirements for managing roads in bull trout habitat, and the agency has a duty to arrive at an environmentally and fiscally sustainable minimum road system.

3. The current rush to declare the grizzly “recovered” is premature. The Flathead National Forest incorrectly attempts to disavow the need for maintaining plan components provided by amendment 19 because the plan already supports a recovered grizzly bear population, even though 19 percent open motorized route density, 19 percent total motorized route density, and 68 percent core levels have not been achieved in every subunit (draft EIS, vol. 1, p. 408).

Response

1. The 2006 draft forest plan is no longer relevant because it was initiated under a planning rule that is no longer valid. In addition to decommissioned roads, the Forest has closed about 799 miles of roads with barriers and about 947 miles with gates on NFS lands in the amendment 19 area. Forest plans are meant to be adaptive to new information through revision and amendment over time. Amendment 19 was the best available scientific information when adopted, but

research and monitoring of the NCDE grizzly bear population in subsequent years supports the changes in the action alternatives for the Flathead's revised forest plan (also see the comments and responses under Grizzly Bear—Road Density and Security Core Habitat, Best Available Scientific Information—Amendment 19, Grizzly Bear—Portrayal of Alternative A and Amendment 19, and Grizzly Bear—Habitat Security). The forest plan continues some of the grizzly bear habitat protections, increases some of the protections, and modifies some of the protections as needed for ecological sustainability, at the same time contributing to social and economic sustainability consistent with the Forest's multiple-use requirements (36 CFR 219.8, Sustainability; 36 CFR 219.10, Multiple Use). The responsible official will consider all alternatives and their effects (including alternative A, which would continue to implement amendment 19). The Forest consulted with the USFWS on the effects of alternative B modified, and they concluded that this alternative would contribute to the continued recovery of the NCDE grizzly bear population. See the USFWS biological opinion (USFWS, 2017b) for more details.

2. The forest plan does not eliminate road density and secure core standards. Under all action alternatives, including alternative B modified, forestwide standard FW-STD-IFS-02 would maintain on-the-ground conditions that have contributed to the recovery of the NCDE grizzly bear population. FW-STD-IFS-02 states, "In each bear management subunit within the NCDE primary conservation area, there shall be no net decrease to the baseline (see glossary) for secure core and no net increase to the baseline open motorized route density or total motorized route density on National Forest System lands during the non-denning season (see glossary) . . ." The standard then lists conditions that are not considered a net increase/decrease from the baseline. Some commenters stated their opinion that the standard is being weakened. The Forest's intention is to provide clarification that the conditions listed in FW-STD-IFS-02 have occurred during the time period that amendment 19 has been in effect. For example, percentages for open motorized access density, total motorized access density, or secure core for a grizzly bear management subunit have changed due to changes in map projections. Most changes to open motorized route density, total motorized route density, and secure core percentages resulting from the conditions listed in the bullets result in no change in on-the-ground conditions for grizzly bears or result in minor or short-term changes to the percentages. For example, the Forest has had temporary changes in open motorized route density, total motorized route density, and/or security core percentages due to emergency situations such as wildfires. As another example, acquisition of private lands by the Forest Service may result in changes to open motorized route density, total motorized route density, or secure core percentages without any actual change in on-the-ground conditions. See also the comments and responses under Grizzly Bear—Portrayal of Alternative A and Amendment 19.

The EIS acknowledges that management for grizzly bear habitat security also provides habitat security for elk and other wildlife, as indicated in section 3.7.4 of the final EIS, subsection "Forest ungulates." Section 3.2 of the final EIS discusses the effects of roads on water quality and quantity and aquatic species. The biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) discusses effects to bull trout and their critical habitat in more detail.

The Forest's environmentally and fiscally sustainable minimum road system was assessed in the Travel Analysis Report for the Flathead National Forest (USDA, 2014c). The Flathead National Forest expects to maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns. The NFS road system of the future must continue to provide needed access for recreation and resource management as well as support watershed restoration and resource protection to sustain healthy ecosystems. The Road Management Rule was published in the Federal Register on January 12, 2001, and amended by

the Travel Management Rule in 2005, and it established road and travel management regulations for the Forest Service in 36 CFR 212. Subpart A of these regulations pertains to administration of the forest transportation system. In part, Subpart A requires each unit of the NFS to (1) identify the minimum road system needed for safe and efficient travel and for protection, management, and use of NFS lands (36 CFR 212.5(b)(1)) and (2) identify roads that are no longer needed to meet forest resource management objectives (36 CFR 212.5 (b)(2)). In determining the minimum road system, the responsible official must incorporate a science-based roads analysis at the appropriate scale. It is Forest Service policy (Forest Service Manual 7710.3) that the travel analysis process defined in Forest Service Handbook 7709.55 chapter 20 is to serve as the “science-based roads analysis” required by 36 CFR 212.5 (b)(1). Travel analysis is not a decisionmaking process. Rather, travel analysis informs decisions related to administration of the forest transportation system and helps to identify proposals for change (Forest Service Manual 7712). The travel analysis process was used to inform plan components included in the Flathead National Forest’s revised forest plan.

3. Statements asserting that the NCDE population is “recovered” have been removed in the final EIS. See also comments and responses for Grizzly Bear Conservation Strategy—Range of Alternatives.

Grizzly Bear—Vehicle and Train Collisions

Comment (letter number 324)

The Forest Service must consider the ongoing threat to grizzly bears from train and vehicle collisions and work to address it by providing safe passages that connect subpopulations.

Response

Section 6.5.5 of the final EIS presents available information about sources of grizzly bear mortality, including automobile and train collisions, in the NCDE. The Forest Service has coordinated with transportation agencies and railroads for many years in an effort to reduce grizzly bear mortality risk, and a section on highway and railroad mortality has been added to the discussion of ongoing conservation actions in section 4.1.4 of the final EIS. The action alternatives include a desired condition (NCDE-HNF Zone 1&2-DC-02) that would apply to the portion of the Helena-Lewis and Clark National Forest that is within zone 1 and the portion of zone 2 west of Interstate 15 to consolidate lands adjacent to highways and support other efforts to reduce barriers to the genetic connectivity of grizzly bear populations in the NCDE and the Greater Yellowstone Ecosystem. Similarly, a desired condition is added under the action alternatives for the Kootenai National Forest (NCDE-KNF Zone 1-DC-02) and Lolo National Forest (NCDE-LNF Zone 1-DC-02) that would apply to the areas between the primary conservation area and the Salish and Ninemile demographic connectivity areas to support land consolidation and conservation easements with willing landowners in a manner that provides habitat connectivity and facilitates movement of wildlife. On the Flathead National Forest, plan components address connectivity across highways and the railroad in multiple areas, including the Salish demographic connectivity area (also see the comments and responses under Wildlife—Modeling and Managing Connectivity).

Grizzly Bear Conservation Strategy

Grizzly Bear Conservation Strategy—Affected Environment, Pollinators

Comment (letter numbers 2889, 2940)

The Forest Service should adopt the standard requiring anyone using NFS land to raise bees to install bear-resistant electric fencing forestwide across all of the NCDE national forests.

Response

The Forest agrees that the use of electric fencing has been shown to be effective in securing attractants. All of the action alternatives would incorporate standard NCDE-STD-SFP-01 for the amendment forests and standard FW-STD-OFP-01 for the Flathead National Forest: “Special-use permits for apiaries (beehives) located on National Forest System lands shall incorporate measures including electric fencing to reduce the risk of grizzly bear-human conflicts, as specified in the food/wildlife attractant storage special order.”

Grizzly Bear Conservation Strategy—Connectivity

Comment (letter numbers 306, 2601, 2809, 2879, 2901, 2904, 3002, 3020, 3133, 3160, 3194)

The Forest Service should do more to enhance habitat connectivity in the primary conservation area, zone 1, and demographic connectivity areas and to promote connectivity through zone 2 to the Greater Yellowstone Ecosystem.

The Forest Service should ensure connectivity through the Salish Mountains, the Nevada Mountain Inventoried Roadless Area, and zone 2 east of the Divide.

Response

The management direction (desired conditions, standards, and guidelines) applicable to the primary conservation area is aimed at sustaining a source population of grizzly bears in this area. For the Flathead National Forest’s plan revision, habitat connectivity was also addressed through plan components and analysis for multiple wildlife species (see also the comments and responses under Wildlife—Modeling and Managing Connectivity, Grizzly Bear Conservation Strategy—Connectivity, Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest, and Alternatives—Wildlife Connectivity Effects for detailed discussion on connectivity as a key element of the Flathead’s forest plan revision). These plan components and the final EIS section 3.7.5, subsection “Grizzly bear,” address grizzly bear population connectivity between Olney and Trego across U. S. Highway 93 and in the Salish demographic connectivity area and along the Canadian border in the Whitefish Range to support connectivity with the Cabinet-Yaak recovery area, Glacier National Park, and Canada. The Forest Service consulted with the USFWS on the effects of alternative 2 modified and alternative B modified on the grizzly bear. The USFWS biological opinions (USFWS, 2017a, 2017b) for the amendment forests and the Flathead’s revised forest plan confirm that management direction will not jeopardize the NCDE population and will support recovery.

For the grizzly bear amendments, the action alternatives include a desired condition for NFS lands in the primary conservation area and zone 1, including the Ninemile and Salish demographic connectivity areas, that specifically addresses connectivity with neighboring grizzly bear recovery zones. The action alternatives also considered plan components that would provide for genetic connectivity between the NCDE and the Greater Yellowstone Ecosystem. As stated in the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013, p. 4), habitat protections on Federal and tribal lands in zone 1 should focus on limiting the miles of open road and managing current roadless areas as stepping stones to other ecosystems.

Some commenters expressed concern about connectivity for grizzly bears in the Salish demographic connectivity area and voiced support for alternative C, which would designate a large portion of this area as management area 6a. One comment requested a special management area such as a grizzly bear demographic linkage area, along with some general forest low-intensity vegetation management (management area 6a) for this area, with emphasis on reducing total motorized road and trail densities. The preferred alternatives (B modified for the Flathead National Forest and 2 modified for the Kootenai National Forest) contain a standard that would limit roads and trails open to public motorized use to baseline levels in the Salish demographic connectivity area, regardless of management area. All alternatives maintain the Le Beau Research Natural Area (management area 4a) in the Salish demographic connectivity area. As explained on page 42 of the draft NCDE Grizzly Bear Conservation Strategy, research natural areas are protected from new road construction and are thereby safeguarded from decreases in habitat security. Wheeled motorized use is not allowed. Management area 4a areas are mapped as “semiprimitive nonmotorized” for the recreational opportunity spectrum (also see the comments and responses under Recreational Opportunity Spectrum—Management and Recreational Opportunity Spectrum—Allocation regarding the process for mapping recreational opportunity spectrum).

In response to public comments expressing concerns about connectivity between the NCDE and the Greater Yellowstone Ecosystem, both of the action alternatives for the amendments include a desired condition (NCDE-HNF Zone 1&2-DC-02) for zone 1 and the portion of zone 2 west of Interstate 15 that supports consolidating NFS lands adjacent to highways and other efforts that reduce barriers to the genetic connectivity of grizzly bear populations. The alternatives also consider standards that would limit motorized route densities in zone 1 or zone 2 west of Interstate 15.

The rationale for not adding forest plan components for grizzly bears in zone 2 east of Interstate 15 was provided in the final EIS in section 5.6.5, “Alternatives considered but not given detailed analysis.” To summarize, it appears that most bear movements and the best opportunity for genetic connectivity between the NCDE and the Greater Yellowstone Ecosystem are west of Interstate 15. The draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013, appendix 10) reviewed existing forest plan direction applicable to zone 2 and concluded that it has been and is expected to be adequate to provide for the movement of grizzly bears, particularly males. This existing direction was reviewed and updated (Warren, 2017).

There was a request to extend zone 1 to include the entire Nevada Mountain Inventoried Roadless Area rather than spanning zones 1 and zone 2. The purpose of zone 1 is to provide a buffer area surrounding the primary conservation area within which grizzly bear population data, including mortalities, are monitored. Extending the boundary of zone 1 for the purpose of roadless area conservation is outside the scope of the amendment. The Nevada Mountain Inventoried Roadless Area will continue to be managed in accordance with the Forest Service 2001 Roadless Area Conservation Rule, which does afford consistency in management. This area will be subject to further evaluation during the revision of the Helena-Lewis and Clark forest plan.

In response to the comment that grizzly bear habitat must be well distributed as required under the National Forest Management Act, see the comments and responses under Grizzly Bear—Protection.

Grizzly Bear Conservation Strategy—Demographic Connectivity Areas

Comment (letter numbers 2904, 2940, 3005, 3021)

Alternative 3 should be selected because it provides a significantly higher level of protection for grizzly bears in zone 1 and the demographic connectivity areas by including additional standards for access and habitat management.

Because Costello (2016) has documented full occupancy in zone 1 and since grizzlies in zone 1 count toward recovery goals, these bears and their habitat must receive the same protections as in the primary conservation area.

The Forest Service should adhere to amendment 19 road density standards in zones 1 and 2 and the demographic connectivity areas.

The Forest Service should further strengthen habitat security for the demographic connectivity areas in a modified alternative C/alternative 3 by incorporating some of the desired conditions, standards and guidelines currently only proposed for the primary conservation area.

Response

It has long been recognized that grizzly bears will occasionally move into and even reside permanently in areas outside recovery areas, but only bears living inside the recovery zone are considered crucial to recovery goals (USFWS, 1993, p. 18). Because individual bears may move across the recovery zone line, the recovery plan established a 10-mile buffer area surrounding the recovery zone within which the demographic recovery criteria are monitored (pp. 33-34). Zone 1 is described in the draft NCDE Grizzly Bear Conservation Strategy as an area similar in concept to the 10-mile buffer area, where continual occupancy by bears is expected but at lower densities than in the primary conservation area (USFWS, 2013, p. 4). It was not intended that the same habitat protections should apply in the demographic connectivity areas as in the primary conservation area, nor would this be a practical approach. National Forest System lands comprise about 61 percent of the primary conservation area but only about 22 percent of the demographic connectivity areas. Furthermore, NFS lands in zone 1 are at lower elevations and are generally not consolidated or are intermingled with other land ownerships, making application of the same standards proposed for the primary conservation area problematic. In their study of grizzly bears in the Swan Valley, Mace and Waller (1998) concluded that road use restrictions on multiple-use lands in lower-elevation, mixed-ownership settings would be of limited value unless habituation and mortality levels are also minimized on adjacent private lands. The majority of grizzly bear mortalities in the NCDE continue to occur on private lands (Mace & Roberts, 2014). Monitoring of grizzly bear mortality will include zone 1 to ensure that a healthy population is maintained. For these reasons, this alternative was identified in section 5.6.5 of the final EIS as an alternative considered but eliminated from detailed analysis.

The Grizzly Bear Recovery Plan states that each recovery area includes an area large enough and of sufficient habitat quality to support a recovered population (USFWS, 1993, p. 17). Grizzly bears that move or reside permanently in areas outside the recovery area are not considered necessary to the recovery of the population (p. 18). As explained in the final EIS, zones 2 and 3 are managed for different objectives than the primary conservation area. Outside of the primary conservation area, bears are expected to occur at lower densities. Section 5.6.5 in the final EIS identifies and provides the rationale for alternatives that were considered but not given detailed analysis. Proposals to extend all motorized route standards for the primary conservation area to zone 1 and to extend all plan components to zone 2 or zone 3 are addressed in this section of the final EIS. Regarding the comment to adhere to amendment 19 as part of the action alternatives, refer to the comments and responses under Grizzly Bear—Draft EIS Analysis, Best Available

Scientific information—Amendment 19, and Grizzly Bear—Support for Amendment 19 Standards.

The demographic connectivity areas are intended to support occupancy by grizzly bears, including female bears, but at a lower density than in the primary conservation area. None of the alternatives analyzed in detail in the final EIS includes a requirement to provide secure core in the demographic connectivity areas. The delineation of the demographic connectivity areas incorporated inventoried roadless areas that could serve as stepping stones to other grizzly bear recovery areas, and the action alternatives include standards that would limit the density or miles of open motorized routes in the demographic connectivity areas. The Salish demographic connectivity area incorporates one inventoried roadless area on the Kootenai National Forest (1,260 acres) and one on the Flathead National Forest (5,433 acres), whereas the Ninemile demographic connectivity area incorporates four inventoried roadless areas (totaling 52,079 acres). The effects analysis in the final EIS compares the average motorized route density in the demographic connectivity areas to thresholds identified by Boulanger and Stenhouse (2014) and concludes that the demographic connectivity areas would be likely to support occupancy by female bears. See also the comments and responses under Best Available Scientific information—Amendment 19.

Grizzly Bear Conservation Strategy—Energy and Mineral Resources

Comment (letter numbers 2816, 2940, 3005)

The Forest Service should do more to minimize effects to grizzly bears from mineral and energy development.

A no surface occupancy stipulation should be included. The Forest Service should add NCDE-DC-MIN-02: “Within the NCDE PCA [primary conservation area] and Zone 1 (including demographic connectivity areas), USFS will work with the Bureau of Land Management (BLM) to develop Master Leasing Plans (MLPs) with bear-specific assessments prior to development taking place. These MLP’s will include regulations around surface occupancy, operations, best management practices, mitigation, etc.”

To demonstrate its commitment to long-term conservation of grizzly bear habitat in the NCDE, the Forest Service should do two things: first, formally and explicitly acknowledge that the grizzly bear habitat standards and guidelines that are being adopted are legally binding; second, clarify that the grizzly bear habitat standards and guidelines that are being adopted (or that may be added by additional forest plan amendments) will remain in place for as long as the Forest Service is a signatory to an existing NCDE Grizzly Bear Conservation Strategy.

Response

In the final EIS, a standard was added to alternative 2 modified (alternative B modified for the Flathead National Forest) that would require a no surface occupancy stipulation in the primary conservation area. Alternative 3 (alternative C for the Flathead National Forest) also requires a no surface occupancy stipulation in the primary conservation area and zone 1. The effects of these standards are disclosed in the final EIS, section 3.7.5 “Grizzly bear” and section 6.5.5 “Grizzly Bear.”

The suggested new desired condition NCDE-MIN-DC-02 does not conform to Forest Service policy regarding forest plan direction, which specifies that plan components should not be written in a way that requires additional planning. Any oil and gas leasing analysis that occurs will follow

NEPA requirements, and coordination will occur with other agencies at that time. Established procedures are in place to guide decisionmaking at the leasing and exploration and development phases. The minerals plan components proposed under the action alternatives would require considerations specific to grizzly bears and their habitat (including operations, best management practices, mitigation, etc.). The National Forest Management Act requires that projects be consistent with the forest plan. The 2012 planning rule clearly states that a standard is mandatory and that the purpose of a guideline must be met.

The draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) provides a cohesive umbrella for all signatories to operate under, but each signatory has their own legal process and authority to implement the Conservation Strategy. The expectation is that the Conservation Strategy, once finalized, would remain in effect beyond recovery, delisting, and the five-year monitoring period required by the Endangered Species Act. In the final EIS, it was explicitly acknowledged that the grizzly bear is a conservation-reliant species and that habitat protections are expected to remain in place. The agencies are committed to be responsive to the needs of the grizzly bear through adaptive management actions based on the results of detailed annual population and habitat monitoring. Forest Service responsibilities for monitoring are specified in chapter 5 of the revised forest plan for the Flathead National Forest and in the monitoring section of appendix 1 of the draft ROD for the amendment forests. Grizzly bears and their habitat will be monitored to determine whether plans need to be adjusted in the future.

One commenter expressed concern about the statement in the draft EIS on page 32, volume 3, that “the amended management direction will remain in place throughout the life of the forest plans . . . which is about 15 years.” The National Forest Management Act specifies that forest plans are to be revised from time to time when conditions have changed, or at least every 15 years. Therefore, the Forest Service assumes that the life of a forest plan is about 15 years. The Helena-Lewis and Clark National Forest is now in the process of preparing a revised forest plan. Parts of a forest plan that have recently been updated may be rolled forward, as the Kootenai National Forest did, for example, by incorporating the Grizzly Bear Motorized Access Amendment into its revised forest plan.

Grizzly Bear Conservation Strategy—Food Storage Orders

Comment (letter numbers 306, 3024, 2809, 2816, 2940, 3160)

Food and attractant storage orders in the primary conservation area, zone 1, and zone 2 should be included. But, the Forest Service should add more habitat protections in zone 2 to achieve functional connectivity between the NCDE and the Greater Yellowstone Ecosystem and should extend the food storage order requirement to zone 3 to ensure that enforcement is adequate.

Response

The support expressed for requiring food/attractant storage orders in the primary conservation area, zone 1, and zone 2 is noted. Standard FW-STD-WL-02 (NCDE-STD-WL-02) states that food/wildlife attractant storage special order(s) shall apply to National Forest System lands in the primary conservation area, zone 1, and zone 2, as applicable to each of the amendment forests and the Flathead National Forest. The food/attractant storage orders apply to all visitors and users of NFS lands. Additionally, the Forest Service will seek to notify contractors, permittees, lessees, operators, and their employees of the requirements to help prevent conflicts. The language used for guideline FW-GDL-WL-01 (NCDE-GDL-WL-01) was deliberately chosen to conform with the 2012 planning rule.

The draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) recommended that existing forest plan direction should continue to apply in zone 2 because male grizzly bears have not been precluded from occupying zone 2 in low densities. Although the action alternatives do not propose new habitat standards or guidelines for grizzly bears in zone 2, it does not follow that there are no habitat protections already in place in zone 2 to support functional connectivity between the NCDE and the Greater Yellowstone Ecosystem. A number of forest plan standards that are designed to benefit other species or resource values would also provide for the movement of grizzly bears. The existing management direction was summarized in appendix 10 of the draft conservation strategy and was reviewed and updated as part of the analysis for the final EIS (Warren, 2017).

The draft NCDE Grizzly Bear Conservation Strategy acknowledges that grizzly bears may sometimes be found in zone 3. However, by definition, zone 3 does not have enough suitable habitat to contribute meaningfully to the long-term survival of the NCDE population and does not lead to other recovery areas. Only about 8 percent of zone 3 is NFS lands, so the Forest Service does not have the authority to manage much of zone 3. Management emphasis in zone 3 under the conservation strategy would be on responding to grizzly bear-human conflicts. As discussed in the final EIS section on alternatives considered but eliminated from detailed study (section 5.6.5), the Forest Service does not believe it is necessary to require food/attractant storage orders or other habitat protections in order to meet grizzly bear objectives for zone 3.

The Forest Service monitors and enforces compliance with its regulations, including the food and attractant storage orders.

Grizzly Bear Conservation Strategy—General

Comment (letter numbers 2801, 2888, 2904, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

The Forest Service should assess whether the objectives stated in the draft Grizzly Bear Conservation Strategy can be achieved by the habitat standards. The following specific points were raised:

1. Open road limitations that are based on the new 2011 baseline standard have no basis in science. How can the Forest Service know that “continual occupancy” based on this standard will indeed be achieved without the underlying scientific bases to support its assertion?
2. Under the new Kootenai National Forest plan, inventoried roadless areas are systematically denied recommended wilderness status, with most designated as motorized backcountry instead, which allows for increased levels of motorized use.
3. Management control of food-conditioned grizzlies is among the leading causes of NCDE mortality (Costello et al., 2016). Accordingly, this source of mortality must be duly considered as applied against the “continual occupancy” objective. And further, the State of Montana manages over 500,000 acres in the NCDE yet does not control attractants on its lands.
4. The draft NCDE Grizzly Bear Conservation Strategy, and any forest plan amendments based upon it, intend to manage zone 2 as a mortality sink, not a population link, as claimed.

5. Some grizzly bears have occupied zone 3, east of Highway 89, for over two decades, but no additional habitat measures are proposed for zone 3 lands. Leaving areas outside of the primary conservation area largely unprotected is likely to have a more significant impact on grizzly bears than the Forest Service admits in the draft EIS.

Response

1. Regarding the scientific basis for the 2011 baseline, refer to the comments and responses under Best Available Scientific Information—Grizzly Bear. Costello et al. (2016) documented the presence of reproductive females within seven “supplementary bear management units” in zone 1 during at least one year over the period 2004-2014. During the most recent six-year period, all seven were occupied by females with young during at least one of the six years. MFWP has been conducting and reporting on population monitoring for the NCDE and, as a signatory to the conservation strategy, would continue to do so.

2. See the comments and responses under Grizzly Bear Conservation Strategy—Kootenai National Forest Amendment.

3. All sources of mortality, including management removals, are monitored. The demographic recovery objective established for the NCDE in the recovery plan (USFWS, 1993) includes an annual mortality limit for human-caused bear mortalities and a limit on human-caused mortalities of female bears. These data are reported annually. The cumulative effects analyses for grizzly bear in the biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017) and final EIS address the management of grizzly bear habitat and grizzly bear-human conflicts on other ownerships, including State lands.

4. It is not the intent of the draft NCDE Grizzly Bear Conservation Strategy or of the forest plan amendments to manage zone 2 as a mortality sink. It has long been recognized that grizzly bears will move and even reside permanently in areas outside recovery zones, but only the area inside the recovery zone is essential to recovery (USFWS, 1993, p. 18). The conservation strategy recognized the potential for the NCDE to serve as a source population to other recovery areas and identified zone 2 to provide the opportunity for genetic connectivity between the NCDE and Greater Yellowstone Ecosystem. The conservation strategy stated that because existing management direction in Forest Service and Bureau of Land Management land management plans has not precluded grizzly bears from occupying this area at low densities, existing direction would continue to apply (USFWS, 2013, p. 91). Under alternative 3, the Forest Service also considered plan components that provide additional consideration for the portion of zone 2 that is west of Interstate 15. The effects of the alternatives with regard to connectivity between recovery areas were addressed in the final EIS. The expansion of the NCDE grizzly bear population into zone 2 has occurred relatively recently. As more is learned about bear movement patterns, the forest plans could be amended or revised in the future if deemed necessary. See also responses to comments under Grizzly Bear Conservation Strategy—Helena National Forest Amendment.

5. As shown in section 4.3 of the final EIS, NFS lands comprise only about 9 percent of zone 3. Since zone 3 does not have a goal of occupancy by grizzly bears, no habitat standards were proposed. However, existing forest plan management direction to protect other wildlife species or resources would remain in place, which is acknowledged to provide some benefit to grizzly bears.

Grizzly Bear Conservation Strategy—Grazing Impacts

Comment (letter numbers 324, 3005)

The Forest Service should select alternative 3 for the amendment forests (or alternative C for the Flathead National Forest) because it would be more likely to reduce grizzly bear-livestock conflicts in the NCDE.

The Forest Service should account for the ongoing threats to grizzly bears caused by livestock, including chickens, pigs, and apiaries, and the competition between livestock and bears for forage.

Response

The action alternatives include standard NCDE-STD-GRZ-06 (FW-STD-GR-06) that addresses temporary permits for grazing by small livestock for purposes such as controlling invasive exotic weeds, reducing fire risk, or trailing of small livestock across NFS lands. Under all action alternatives, standard NCDE-STD-SFP-01 (FW-STD-OFP-01) would require that special-use permits for apiaries (beehives) located on NFS lands incorporate measures including electric fencing to reduce the risk of grizzly bear-human conflicts, as specified in the food storage order. Under all action alternatives, guideline NCDE-GDL-GRZ-02 (FW-GDL-GR-02) states that an allotment management plan and plan of operations within the NCDE primary conservation area should specify any needed measures to protect key grizzly bear food production areas (e.g., wet meadows, stream bottoms, aspen groves, and other riparian wildlife habitats) from conflicting and competing use by livestock. The effects of livestock grazing on NFS lands, as well as the potential mortality risk on private lands from attractants such as chickens and beehives, are analyzed in the grizzly bear sections in section 3.7.5 of and 6.5.5 the final EIS.

Grizzly Bear Conservation Strategy—Grazing Standards and Guidelines

Comment (letter numbers 2809, 2816, 2940)

The Forest Service should extend the plan components (particularly those that would close sheep grazing allotments if there is a willing permittee) to zone 1 and the demographic connectivity areas.

The Forest Service should also extend NCDE-GDL-GRZ-01 and 02 and FW-GDL-GR-01 and 02 into zones 1 and 2.

Standards NCDE-STD-GRZ-04 and 05 should read “Note: Existing allotments may be combined or divided as long as it does not result in an increase in AUMs [animal unit months] or grazing allotments in currently unallotted lands.”

Response

All of the grazing desired conditions, standards, and guidelines apply to the primary conservation area under alternative 2/alternative B, and most are extended to zone 1 and the demographic connectivity areas under alternative 3/alternative C in the draft EIS. Based on public comments and further consideration of the importance of managing mortality risk in zone 1 and the demographic connectivity areas, in the final EIS several of the plan components that would help to reduce the risk of conflicts were extended to zone 1 and the demographic connectivity areas under alternative 2/alternative B modified: NCDE-STD-GRZ-01 (FW-STD-GR-01), NCDE-STD-GRZ-02 (FW-STD-GR-02), NCDE-STD-GRZ-03 (FW-STD-GR-03), NCDE-STD-GRZ-04 (FW-STD-GR-04), and NCDE-STD-GRZ-06 (FW-STD-GR-06). The final EIS provides an analysis of the effects of the alternatives that considers these plan components.

The wording of standards NCDE-STD-GRZ-04 and 05 (FW-STD-GR-04 and 05) have been slightly changed in the final EIS under alternative 2/alternative B modified. Standard NCDE-STD-GRZ-04 applies to sheep allotments, which are intended to have no net increase in either the number of allotments or the number of sheep animal unit months that are permitted. The Helena National Forest is the only one of the Forests with active sheep allotments in the primary conservation area. Standard NCDE-STD-GRZ-05 (FW-STD-GR-05) applies to cattle allotments and limits only the number of allotments (not the animal unit months). The rationale for this difference is provided in the grizzly bear sections of the final EIS on grazing (section 3.7.5, “Grizzly bear,” and section 6.5.5 “Grizzly bear”).

Guidelines NCDE-GDL-GRZ-01 and 02 (FW-GDL-GR-02) apply to the primary conservation area under both alternatives 2 and 3. An alternative to extend all of the primary conservation area standards and guidelines into zone 2 was considered but eliminated from detailed analysis (see final EIS section 5.6.5).

Grizzly Bear Conservation Strategy—Helena National Forest Amendment

Comment (letter numbers 108, 306, 2816, 2889, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

Commenters supported plan components that provide for grizzly bear genetic connectivity from the NCDE to the Greater Yellowstone Ecosystem through the Helena National Forest and suggested a number of ways in which the plan direction could be strengthened or extended into or throughout zone 2.

1. The Forest Service should modify new desired condition NCDE-HNF Zone 1&2-DC-02 to cover the entire Divide landscape and apply habitat protections (reduce road densities) across the entire Divide landscape south to the Beaverhead-Deerlodge National Forest to support occupancy and movement to the Greater Yellowstone Ecosystem.
2. The Forest Service should not totally exclude mention of the Beaverhead-Deerlodge National Forest in this forest amendment process.
3. One bear per decade is not connectivity.
4. The Forest Service should include a statement in the final amendment that “female occupancy is expected” to occur at lower densities in zone 2 and that “recommendations are pending.”
5. The Forest Service should reconsider adding demographic areas and habitat protections in the Big Belt and Little Belt Mountains in the final EIS.
6. The Forest Service should include NCDE-HNF Zone-1-DC-01 in zone 2 and modify alternatives 2 and 3 to improve habitat-based protections for grizzly bears in zone 2.
7. The Forest Service should prohibit no surface occupancy on new oil and gas leases in the primary conservation area and zone 1.
8. The Forest Service should consider modifying alternative 3 to meet the 2012 planning rule’s connectivity requirements.

9. The Forest Service should analyze zone 2 to assess source/sink habitats and the capability to connect the NCDE and the Greater Yellowstone Ecosystem.

Response

1. In the draft EIS for alternative 3, the “expanded grizzly bear distribution zone” in NCDE-HNF Zone 1&2-DC-02 and NCDE-HNF Zone 1&2-STD-02 is the area identified in a previous forest plan biological opinion. However, this terminology seemed confusing to many and may have given the impression it was not a fixed area. In the final EIS, the description of the area is changed to “zone 1 and the portion of zone 2 west of Interstate 15 on the Helena-Lewis and Clark National Forest.” This area is shown in the final EIS, figure 1-72, and it does in fact encompass all of the Continental Divide Landscape. In response to this public comment, NCDE-HNF Zone 1&2-DC-02 was added to alternative 2 modified for this area. Under alternatives 1 and 2 modified, existing forest plan direction regarding road densities would be retained; under alternative 3, standard NCDE-HNF Zone 1&2-STD-02 would be added, which would place a new limit of 2.4 miles/square mile on motorized route density in this area.

2. As shown in the draft NCDE Grizzly Bear Conservation Strategy, the Beaverhead-Deerlodge National Forest has no acreage within the primary conservation area, zone 1, or zone 3, but there is a portion of the national forest that is within zone 2 (USFWS, 2013, pp. 48, 84, 91, 92). The draft NCDE conservation strategy states:

Because we know that management direction in current USFS and BLM land management plans in zone 2 did not preclude male grizzly bears from occupying this area in low densities, existing direction will continue to apply. Land management plans on lands managed by BLM or USFS contain numerous standards to benefit other species or resource values that will also benefit grizzly bears. Existing direction for USFS and BLM land management plans is summarized in Appendices 10 and 11. (p. 91)

Because no changes are needed to the Beaverhead-Deerlodge forest plan direction for zone 2, the Beaverhead-Deerlodge National Forest was not included in the proposed action to amend forest plans. Additional information about the road management direction in areas of the Beaverhead-Deerlodge National Forest that could connect to the Helena National Forest was added to the effects analysis in the final EIS. The expansion of the NCDE grizzly bear population outside of the recovery area is relatively recent; as more is learned about grizzly bear movement patterns in relation to zone 2, forest plan direction could be amended or revised in the future if deemed necessary.

3. In its five-year status review for the grizzly bear, USFWS (2011, pp. 86-92) discussed connectivity and genetic management in some detail. In discussing the desirability of restoring connectivity between isolated populations, they distinguished between small populations (less than 100 individuals, such as the Cabinet-Yaak population) that benefit greatly from demographic rescue through immigration of females and benefit to a lesser extent from genetic rescue from immigration of male bears versus large populations (such as the Greater Yellowstone Ecosystem population) that are at less risk from demographic and environmental stochasticity. Experimental and theoretical data suggest that one or two effective migrants per generation is sufficient gene flow to maintain or increase genetic diversity in larger isolated populations (Miller & Waits, 2003; Mills & Allendorf, 1996). Additional explanation was added to section 6.5.5 of the final EIS to more clearly explain the different objectives for demographic connectivity areas and genetic connectivity areas and how the plan components were designed with that difference in mind.

4. It has long been recognized that grizzly bears may move and even reside permanently outside of the recovery zones, and they are expected to do so in many areas (USFWS, 1993, p. 18). However, bears outside the recovery zone are not considered crucial to recovery (USFWS, 2011, 2013). It is recognized that female bears may occupy zone 2, as described in the affected environment part of section 6.5.5 of the final EIS. Under the action alternatives, a desired condition is added for the portion of zone 2 west of Interstate 15 on the Helena National Forest to support efforts to reduce barriers to the genetic connectivity of grizzly bear populations. As more is learned about grizzly bear movement patterns in relation to zone 2, the information will be evaluated and the forest plans could be amended or revised if deemed necessary.

5. An alternative to add demographic connectivity areas or habitat protections for grizzly bears in the Big Belt and Little Belt Mountains is discussed in the final EIS section on alternatives considered but not given detailed analysis (section 5.6.5). Additional explanation has been added to the final EIS in section 6.5.5 to further clarify the differences between demographic connectivity and genetic connectivity. At this time, grizzly bears have not been observed on NFS lands in the Big Belt or Little Belt mountain ranges. During the summer of 2017, two sightings of grizzly bears on private land in the Big Belts were confirmed by MFWP for the first time in decades. However, available information indicates that the grizzly bear population expansion has occurred primarily to the southwest (west side of the Helena National Forest) and onto the shortgrass prairie to the east (Mace & Roberts, 2014). A recent publication by Peck et al. (2017) analyzed GPS telemetry data from 173 male grizzly bears in the NCDE and the Greater Yellowstone Ecosystem. A new method (randomized shortest path algorithm and step selection function models) was used to identify potential paths for dispersal. The resulting models depicted numerous potential paths from the NCDE to the Greater Yellowstone Ecosystem. The models predicted dense intersecting paths in the center of the study area between the recovery zones, with more diffuse paths on the eastern periphery through the Little Belt Mountains. The predicted paths were corroborated by the locations of the confirmed observations of 21 grizzly bears located outside the two occupied ranges.

It is possible that in the future grizzly bears may be observed on NFS lands in the Little Belt and Big Belt Mountains. However, at this time it appears that the area with the shortest distance and greatest potential to support movement to the Greater Yellowstone Ecosystem is through the Helena National Forest west of Interstate 15. In any case, additional habitat protections in the Big Belt and Little Belt mountain ranges would not be needed to achieve the zone 2 goal of genetic connectivity (USFWS, 2013). For these reasons, this alternative was eliminated from detailed analysis. As more is learned about actual grizzly bear movement patterns through zone 2, the information will be evaluated and the forest plans could be amended or revised if deemed necessary.

6. Zone 2 is not considered necessary to sustain the NCDE grizzly bear population. The desired condition for zone 2 is expressed under the action alternatives in NCDE-HNF Zone 1&2-DC-02. Desired condition NCDE-DC-WL-01 and standard NCDE-STD-WL-02 requiring that food/attractant storage orders be in place on NFS lands would apply to zone 2 under the action alternatives. Existing forest plan direction would remain in place for zone 2 under all alternatives, which has been sufficient to enable bears to occupy this area in low densities (USFWS, 2013, p. 91).

7. A no surface occupancy stipulation for new leases in the primary conservation area and zone 1 was analyzed under alternative 3 in the draft EIS. In response to public comments, alternative 2 and alternative B were modified to include a requirement for a no surface occupancy stipulation

on new leases in the primary conservation area (standard NCDE-STD-MIN-08). The effects of the alternatives on grizzly bears are displayed in section 6.5.5 of the final EIS.

8. As stated in final EIS section 4.2, the transition provisions of the 2012 planning rule (36 CFR 219.17) allow for the amendment of approved forest plans under provisions of the prior (1982) rule. As stated in the purpose and need, the Forest Service's intention is to adopt consistent plan components for grizzly bear habitat management in the NCDE, where applicable. Even though the plans for the amendment forests are being amended under a previous planning rule, this does not mean that connectivity is not considered. The forest plan components addressing the grizzly bear are the same for the amendment forests, which are being amended under the 1982 planning rule, and for the Flathead National Forest, which is being revised under the 2012 planning rule. Both the amended and the revised forest plans meet the National Forest Management Act diversity requirements and Endangered Species Act responsibilities to support recovery of the grizzly bear population.

9. Zone 2 is not considered necessary for recovery of the NCDE grizzly bear population and is not intended to be a source habitat. Available information about the distribution of grizzly bears, including their presence in zone 2, is discussed in the final EIS in the affected environment part of section 6.5.5. The objective for this area is to allow movement by male bears sufficient for genetic interchange from the NCDE to the Greater Yellowstone Ecosystem. As stated in the draft Grizzly Bear Conservation Strategy (USFWS, 2013, p. 91), management direction in current Forest Service and Bureau of Land Management land management plans has not precluded bears from occurring in zone 2 at low densities. The Forest Service has found no evidence of a mortality sink on NFS lands in zone 2.

Grizzly Bear Conservation Strategy—Kootenai National Forest Amendment

Comment (letter numbers 2879, 2889, 2940)

Specific to the Kootenai National Forest, the Forest Service should improve its management to provide secure core in the Ten Lakes Wilderness Study Area; address approach areas in and adjacent to the NCDE to improve connectivity with the Cabinet-Yaak recovery area; provide permanent bear storage containers in new and existing developed recreation sites; and correct a statement in the draft EIS about female bears denning in zone 1.

Response

Evaluations of recommended wilderness were completed as part of the revision of the Kootenai forest plan, completed in 2015. Regarding the Ten Lakes Wilderness Study Area, the Kootenai National Forest released a draft EIS in December 2016 for the Ten Lakes Travel Management Project. Included in that analysis are alternatives that limit over-snow motorized use within the wilderness study area during the active bear year. More information regarding the proposed travel management changes for the Ten Lakes area can be found at <https://www.fs.usda.gov/detailfull/kootenai/landmanagement/planning/?cid=stelprd3841289&width=full>.

The Kootenai forest plan does acknowledge the importance of connectivity between the NCDE and the Cabinet-Yaak populations. The 2015 forest plan retains the access amendment for the Cabinet-Yaak recovery area and also provides forestwide and geographic area direction relevant to providing for connectivity between the NCDE and Cabinet-Yaak Ecosystem. Species-specific discussions on connectivity are presented in the wildlife analysis in the final EIS and in the

specialist's report for the 2015 Kootenai forest plan, as well as a stand-alone section on connectivity in the final EIS and in the wildlife specialist's report for the 2015 forest plan.

Regarding the recommendation to install permanent bear storage containers to improve compliance with the food and attractants storage order, the Kootenai National Forest has installed food storage lockers and wildlife-resistant garbage containers in developed recreation sites across the Forest, including within the NCDE portion of the Forest. The Forest continues to add these to facilities each year as funding allows.

Thank you for the updated information on female denning in zone 1 on the Kootenai National Forest. The Forest Service has made the correction in section 6.5.5 of the final EIS.

Grizzly Bear Conservation Strategy—Lolo National Forest Amendment

Comment (letter numbers 2809, 2829)

The Forest Service should consider expanding the Ninemile demographic connectivity area to the south to enhance the ability of grizzly bears to move between the Northern Continental Divide, the Selkirk/Cabinet-Yaak, and the Bitterroot Ecosystems.

Response

In response to these comments, the Forest Service reviewed the current land ownership and land uses in the area south of Interstate 90 near the Ninemile demographic connectivity area. Directly south of I-90 is the Fish Creek Wildlife Management Area, which is under state ownership. The goals of this area include protecting and enhancing wildlife connectivity. Southeast of the Fish Creek wildlife area is the Burdette Inventoried Roadless Area. The Great Burn area, which is a proposed wilderness area, also connects to the Ninemile demographic connectivity area. There is a substantial amount of private land south of Interstate 90 that has been and is being developed. The draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) delineated the demographic connectivity areas to incorporate available public lands, including existing roadless areas, that appear to be capable of supporting female grizzly bears. Future activities proposed on NFS lands in the demographic connectivity area and adjoining areas to the south will be analyzed for their potential effects on habitat connectivity and grizzly bear movement.

Grizzly Bear Conservation Strategy—NEPA Process

Comment (letter numbers 306, 2940)

The Forest Service should not have proposed the forest plan amendments based on a draft grizzly bear conservation strategy, before habitat-based recovery criteria were completed.

The Forest Service should consider connectivity and metapopulation theory in the proposed action.

The amendments should be prepared under the 2012 planning rule for consistency, not the 1982 planning rule, especially with respect to requirements for connectivity.

The Beaverhead-Deerlodge National Forest should not have been left out of the NCDE Grizzly Bear Conservation Strategy and the amendment process.

Response

The suggestion that the Forest Service should not have proposed the forest plan amendments based on a draft conservation strategy and before habitat-based recovery criteria are completed is discussed in the final EIS, section 5.6.5, “Alternatives considered but eliminated from detailed analysis.” USFWS is continuing its work on the NCDE conservation strategy and habitat-based recovery criteria. The Forest Service has provided information to the USFWS but is not in control of the process or schedule for completion of those documents. In conjunction with the revision of the Flathead forest plan, the Forest Service is taking the opportunity to concurrently amend the Helena, Lewis and Clark, Kootenai, and Lolo forest plans for management of grizzly bear habitat. It is not necessary for the Forest Service to wait until the conservation strategy and habitat-based recovery criteria are finalized before revising or amending its plans. The Forest Service is using the best available scientific information at this time.

When the USFWS finalizes its documents, the Forest Service will be able to assess the conservation strategy and the habitat-based recovery criteria to determine whether there are substantive differences from the revised Flathead National Forest plan and amended forest plan direction and, if so, will follow established procedures to make any needed changes.

As requested, the Forest Service reviewed the section in a scoping letter entitled “Connectivity and Metapopulation Theory” as well as related comments on the draft EIS and has added discussion and analysis of connectivity and metapopulation theory in relation to zone 2 to section 6.5.5 of the final EIS. See also responses to comments under Grizzly Bear—Draft EIS Analysis.

When forest plans are revised under the 2012 planning rule, they must comply with 36 CFR 219.8, which states that the plan must provide for social, economic, and ecological sustainability within Forest Service authority and consistent with the inherent capability of the plan area, including connectivity. As stated in the final EIS section 4.2 describing the proposed action, the transition provisions of the 2012 planning rule (36 CFR 219.17) allow for amendment of approved forest plans under provisions of the prior (1982) rule. As stated in the purpose and need section, the Forest Service’s intention is to adopt consistent plan components for habitat management across NFS lands in the NCDE. Even though the plans for the amendment forests are being amended under a previous planning rule, this does not mean that connectivity is not being considered. The forest plan components addressing the grizzly bear are the same for the amendment forests, which are being revised under the 1982 planning rule, and for the Flathead National Forest, which is being revised under the 2012 planning rule. Both the amended and the revised forest plans meet the National Forest Management Act diversity requirements and Endangered Species Act responsibilities to support species recovery.

As shown in the draft NCDE conservation strategy, the Beaverhead-Deerlodge National Forest has no acreage within the primary conservation area, zone 1, or zone 3, but a portion of the national forest is within zone 2 (USFWS, 2013, pp. 48, 84, 91, 92). The draft NCDE Grizzly Bear Conservation Strategy states:

Because we know that management direction in current USFS and BLM land management plans in zone 2 did not preclude male grizzly bears from occupying this area in low densities, existing direction will continue to apply. Land management plans on lands managed by BLM or USFS contain numerous standards to benefit other species or resource values that will also benefit grizzly bears. Existing direction for USFS and BLM land management plans is summarized in Appendices 10 and 11. (p. 91)

Because no changes to the Beaverhead-Deerlodge forest plan are needed to support the NCDE grizzly bear population, it was not included in the proposed action to amend forest plans. Both

action alternatives address genetic connectivity from the NCDE to benefit the Greater Yellowstone Ecosystem. Information about the food/attractant storage order and road management direction in adjoining areas of the Beaverhead-Deerlodge National Forest is included in section 6.5.5, subsection “Grizzly bear,” of the final EIS.

Grizzly Bear Conservation Strategy—Primary Conservation Area

Comment (letter numbers 306, 2816, 2888, 2940, 3002, 3021)

The Forest Service should maintain or improve habitat protections within the primary conservation area.

The Forest Service should ensure that the action alternatives do not weaken habitat protections for the primary conservation area.

The Forest Service should extend the habitat protections of the primary conservation area to zone 1 (including the demographic connectivity areas) and zone 2.

Response

The approach taken in the proposed action for the forest plan revision and amendments was to incorporate plan components that will maintain the habitat conditions that were in place during the time that the population has been stable to increasing. All of the alternatives are designed to contribute to a stable to increasing grizzly bear population. Regarding the comment that the Forest Service should not rely on the draft Grizzly Bear Conservation Strategy, see the comments and responses under Grizzly Bear—Draft EIS Analysis and Grizzly Bear Conservation Strategy—NEPA Process.

Under alternative 2/alternative B modified, the mineral and energy standards and guidelines and many of the livestock grazing standards and guidelines were extended to zone 1 and the demographic connectivity areas to reduce mortality risk. Under alternative 3, the vegetation guidelines as well as desired conditions and standards to promote genetic connectivity were added to zone 1 and the portion of zone 2 west of Interstate 15 on the Helena National Forest. See also the comments and responses under Grizzly Bear Conservation Strategy—Connectivity.

Alternatives that would not allow temporary changes to secure core, open motorized route density, or total motorized route density; would not allow administrative use of roads; or would not allow temporary public motorized access for uses such as firewood gathering in the primary conservation area, zone 1, or the Salish demographic connectivity area were considered but eliminated from detailed analysis (see section 5.6.5 in the final EIS). An alternative to extend all primary conservation area protections into zone 2 also was considered but was eliminated from detailed analysis. Also see the comments and responses under Grizzly Bear—Road Density and Security Core Habitat.

One commenter suggested extending plan components from the primary conservation area into linkage zones located within the demographic connectivity areas that were identified in Identification and Management of Linkage Zones for Grizzly Bears Between the Large Blocks of Public Lands in the Northern Rocky Mountains (Servheen, Waller, & Sandstrom, 2001). However, the authors pointed out that the linkage zone model they employed used coarse-grain data and did not consider habitat quality and that field validation and testing of assumptions would be needed (p. 172). Servheen, one of the co-authors, was more recently involved in determining the boundaries of the demographic connectivity areas for the NCDE Grizzly Bear

Conservation Strategy, which have a management objective to function as linkage zones in their entirety. During the development of alternatives, the Forest Service asked MFWP if they could identify specific highway crossing areas across Interstate 90, and MFWP stated that they do not have the scientific data to do so at this time (see final EIS, section 5.6.5). Therefore, it is not appropriate to identify more specific areas with separate plan components within the demographic connectivity areas. See also the comments and responses under Grizzly Bear Conservation Strategy—Connectivity, Grizzly Bear—Gene Pool and Connectivity, and Grizzly Bear Conservation Strategy—Helena National Forest Amendment.

The biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017) determined that the preferred alternative, in concert with existing forest plan direction and ongoing conservation actions, would fulfill the Forest Service’s responsibility to conserve the threatened grizzly bear.

Grizzly Bear Conservation Strategy—Range of Alternatives

Comment (letter numbers 44, 2888)

The Forest Service should have a wide range of alternatives that provide for continued management of the grizzly bear as a listed, threatened species in the NCDE. The Forest Service should not assume that the NCDE population is recovered because habitat-based recovery criteria have not been added to the recovery plan.

The Forest Service should not have a range of alternatives that are dependent upon the delisting of the grizzly bear.

The Forest Service should have (1) an alternative that included amendment 19 and (2) alternative C with amendment 19.

The Forest Service should have an alternative that “would maintain or lower baseline road densities in Zone 1 and lower densities in the Salish DCA [demographic connectivity area].”

Response

The Forest Service has considered a wide range of alternatives. Statements asserting that the NCDE population is “recovered” have been removed in the final EIS. Where appropriate, the NCDE population status in relation to the demographic recovery criteria established in the Grizzly Bear Recovery Plan (USFWS, 1993) has been clarified. Sections 3.7.5 and 6.5.5 of the final EIS explain that the population has been stable to increasing, its size is much larger than the previous estimates derived from sightings of females with young, the population has fully occupied all NCDE bear management units, and mortality has been within acceptable limits. The desired condition in the revised forest plan for the Flathead National Forest and in the forest plan amendments is to contribute to sustaining the recovery of the NCDE grizzly bear population and providing connectivity with neighboring grizzly bear recovery zones. It was clearly stated in the draft EIS that sustaining the NCDE grizzly population will depend on continued, effective management of the NCDE grizzly bear’s habitat. The action alternatives were developed based on the best available scientific information on the current status and trend of the NCDE grizzly bear population and the habitat conditions that have supported the increase in their population size and distribution. The forest plan components that contribute to conserving the NCDE grizzly bear population and its habitat would be implemented under any of the action alternatives, whether or not USFWS takes action to delist the population and whether or not habitat-based recovery criteria are added to the recovery plan. The USFWS’s biological opinions for the forest plan

amendments (USFWS, 2017a) and for the Flathead's revised forest plan (USFWS, 2017b) confirmed that the management direction will not jeopardize the NCDE grizzly bear population and will contribute to its recovery.

It is not correct that the action alternatives are dependent on the delisting of the grizzly bear; in actuality, the reverse is true. As pointed out in the five-year status review for the grizzly bear (USFWS, 2011), regulatory mechanisms for the management of motorized access are incomplete. As explained in the draft EIS, the existing Helena, Lewis and Clark, and Lolo National Forest plans do not provide motorized access and secure core standards for grizzly bears. The forest plan amendments were proposed to provide the needed direction for these national forests. USFWS is not able to proceed with delisting until all the necessary regulatory mechanisms are in place.

The draft EIS and final EIS disclose the effects of continued implementation of amendment 19 on the Flathead National Forest under the no-action alternative. Because the effects of alternative C are also disclosed, it is not necessary to separately analyze the effects of combining the two alternatives.

Some commenters suggested that amendment 19 management direction should be included in alternative C and applied to all bear management subunits in the primary conservation area across the NCDE. In the draft EIS and section 5.6.5 of the final EIS, the rationale is provided to explain why this alternative was not analyzed in detail. This included previous analyses that had shown it was not feasible in some subunits due to their unique configuration, proximity to private land developments, the need to maintain open roads for emergency egress, and the legal requirement to provide access to private land inholdings. It was also noted that there is a much more extensive body of knowledge about the grizzly bear population in the NCDE that clearly documents the increase in numbers, distribution, and trend of the population, even though some subunits in the primary conservation area do not meet amendment 19's percentages of 19-19-68.

As discussed in the draft EIS and section 5.6.5 of the final EIS, an alternative to require lower road densities in zone 1 or the Salish demographic connectivity area was considered but was not analyzed in detail. The expectation is that zone 1 will have continual occupancy by grizzly bears but at lower densities than in the primary conservation area. The desired condition for demographic connectivity areas is to support occupancy and potential dispersal by female grizzly bears. The draft EIS acknowledged that the higher road densities and lack of secure core in zone 1 as compared to the primary conservation area likely would have negative impacts on individual grizzly bears. For each alternative, road densities were compared to the thresholds identified by Boulanger and Stenhouse (2014) and showed that zone 1 would be below the threshold for grizzly bear occupancy and that the demographic connectivity areas would be below the threshold for female occupancy, consistent with NCDE population objectives.

Grizzly Bear Conservation Strategy—Recovery Plan

Comment (letter numbers 35, 44, 324, 2888, 2904, 3021)

The Forest Service should not proceed with the revision or grizzly bear amendments until habitat-based recovery criteria are established. The Forest Service should gather essential habitat data and work closely with the USFWS to develop habitat-based recovery criteria for the NCDE grizzly bear population before completing the forest plan revision and amendments

Response

The responsibility for establishing recovery criteria rests with the USFWS. The USFWS has solicited public comments and testimony regarding habitat-based recovery criteria for the NCDE. The Forest Service has worked with the NCDE grizzly bear recovery coordinator throughout the process of developing its habitat management plan components (see USDA, 2014b; USDA, 2015a, 2015b, 2016) and will continue to coordinate with the USFWS as appropriate.

The Forest Service is taking the opportunity to consider updating its forest plans, through revision of the Flathead forest plan and amendments of the Helena, Lewis and Clark, Kootenai, and Lolo forest plans, with respect to the management of grizzly bear habitat. It is not necessary for the Forest Service to wait until the conservation strategy and habitat-based recovery criteria are finalized before revising or amending its plans. The Forest Service is using the best scientific information available at this time to inform its decisions. When the USFWS finalizes the habitat-based recovery criteria, the Forest Service will be able to assess whether there are significant differences between the forest plan components and the habitat-based recovery criteria and, if so, will follow established procedures to make any needed changes to the forest plans.

Grizzly Bear Conservation Strategy—Ski Area Impacts

Comment (letter numbers 108, 2940, 3005)

The Forest Service should incorporate FW-STD-REC-04 and NCDE-STD-AR-07 into the forest plans and should consider extending this plan component to zone 1 and zone 2.

Response

Standard FW-STD-REC-04 (for the Flathead National Forest) or NCDE-STD-AR-07 (for the amendment forests) is now included in all action alternatives for the primary conservation area. The Forest Service does not believe it is necessary to include it in order to meet the objectives for zone 1 or zone 2 because food and attractant storage orders are required in these zones and the responsible officials believe this will be sufficient to protect the grizzly bear in these zones. See also section 5.6.5 of the final EIS (the alternative is titled “Apply all of the primary conservation area habitat standards and guidelines to zone 2”).

Grizzly Bear Conservation Strategy—Spiritual and Heritage Values of Grizzly Bear

Comment (letter number 3005)

The Forest Service should select alternative 3 because it provides the highest level of protection for grizzly bears and their habitat in the NCDE and it maximizes the inspirational and existence value of grizzly bears compared to all other alternatives.

Response

The cultural, inspirational, and existence values of grizzly bears, as well as the protection of grizzly bears and their habitat, are acknowledged and discussed in the final EIS in sections 6.16, 6.17, and 6.18. The responsible official will consider all points of view in making his or her decision. The support expressed for alternative 3 is noted.

Grizzly Bear Conservation Strategy—Vegetation Guidelines

Comment (letter numbers 2816, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest Service should strengthen the language regarding key habitat types and food sources in the primary conservation area. Add NCDE-DC-VEG-03: Within the NCDE, key habitat types and food sources (i.e., whitebark pine) are present across bear management subunits in sufficient populations and locations to provide for grizzly bear habitat needs over the long term.
2. NCDE-GDL-VEG-01 should be changed to read: “Within the NCDE PCA [primary conservation area], logging operations will be restricted in time and space to reduce the potential for adverse grizzly bear disturbance/displacement, as determined by site-specific analysis.”
3. Add NCDE-GDL-VEG-04: Within the NCDE, vegetation management activities shall not be allowed within key habitat types and food sources (i.e., whitebark pine), unless required to maintain the viability of that habitat type or food source.
4. Add a desired condition specific to the demographic connectivity areas that is patterned after NCDE-DC-VEG-01/ FW-DC-TE&V-01 but includes “. . . providing habitat components that contribute to occupancy and movement of female grizzly bears.”

Response

1. As described in the final EIS (sections 3.7.5 and 6.5.5), grizzly bears in the NCDE use a wide variety of habitats and foods during different seasons and years. Because many factors affect the availability of bear foods, the Forest Service did not attempt to identify key habitat types and food sources at the forest plan level. Desired condition FW-DC-TE&V-01/NCDE-DC-VEG-01 states the intent that the amount, type, and distribution of vegetation provides for the ecological, social, and economic sustainability of NFS lands while also providing habitat components that contribute to sustaining the recovery of the NCDE grizzly bear population.
2. The wording of this guideline under the action alternatives in the draft EIS was as follows: “Within the NCDE Primary Conservation Area, vegetation and fuels management activities should be restricted in time and space if needed to reduce the potential for adverse grizzly bear disturbance/displacement, as determined by site-specific analysis.” The Forest Service believes the wording “vegetation and fuels management activities” is preferable to “logging operations” as it better captures the range of activities to which the guideline is intended to apply. Changing the verb from “should be” to “will be” would, according to agency policy, necessitate that the guideline be changed to a standard. Writing this as a guideline is most appropriate because site-specific analysis will be needed to determine whether there is potential for disturbance or displacement of bears, to assess the magnitude or intensity of the disturbance, and to decide what remedies are needed or would be most effective. The wording of this guideline has been modified in the preferred alternative to better reflect the range of options that should be incorporated into project design criteria.
3. The action alternatives already contain a guideline numbered NCDE-GDL-VEG-04. The Forest Service believes that the intent of this comment was not to replace that guideline but rather to add a new guideline. Under the action alternatives, guideline NCDE-GDL-VEG-02 states that “vegetation management activities should be designed to avoid detrimental effects on the grizzly bear population and to include one or more measures to protect, maintain, increase, and/or improve grizzly habitat quantity or quality (e.g., promoting growth of berry-producing shrubs,

forbs, or grasses known to be bear foods) in areas where it would not increase the risk of grizzly bear-human conflicts.” This guideline ensures that the effects of vegetation management on bear habitats and food sources will be appropriately considered during site-specific planning. As explained in the draft EIS, final EIS, and biological assessments (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017), bears are omnivorous, and in the NCDE they utilize a wide variety of habitats and foods during different seasons and years. Therefore, the Forest does not believe the suggested standard for key habitat types and food sources is warranted.

4. Already included in the action alternatives are the desired conditions GA-SM-DC-01, NCDE-KNF Zone 1-DC-01, and NCDE-LNF Zone 1-DC-01 (which state that the demographic connectivity area provides habitat that can be used by female grizzly bears and allows for bear movement between grizzly bear ecosystems). The wording is slightly different than that suggested and is not limited to vegetation management, but the Forest Service believes these desired conditions already state the intent suggested by this comment.

Grizzly Bear Conservation Strategy—Vegetation Management

Comment (letter numbers 108, 324, 2809, 2888, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

Some commenters expressed general support for alternative 3. Several suggestions were offered to make the vegetation management direction more protective of grizzly bears.

1. The Forest Service should account for the loss of whitebark pine and the mountain pine beetle epidemic.
2. The Forest Service should extend the forest plan direction for vegetation management from the primary conservation area to the Salish and Ninemile demographic connectivity areas.
3. The Forest Service should add protection measures for vegetation management in zones 1 and 2.
4. The Forest Service should incorporate security cover guidelines into project designs for riparian areas, wetlands, and other habitat types favored by grizzly bears.
5. Bear attractants in seed mixes should be avoided, not discouraged, and native seed mixes that are not attractants should be used in zone 1 and the demographic connectivity area.
6. The Forest Service should add a desired condition that describes habitat quality and quantity so that compliance with guideline NCDE-GDL-VEG-02/FW-GDL-TE&V 02 may be determined.
7. The Forest Service should protect wildlife habitat through active weed management.

Response

1. The Forest Service agrees that whitebark pine is a keystone species and an important component of the Flathead ecosystem. As explained in the grizzly bear sections in 3.7.5 and 6.5.5 of the final EIS and as summarized in the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013), prior to the spread of white pine blister rust, grizzlies in the NCDE fed on whitebark pine seeds from late summer through fall when and where they were available. However, data on whitebark pine mortality rates from the early to mid-1990s indicated that 42-58

percent of all whitebark pine trees surveyed within the NCDE were dead (Kendall & Keane, 2001) and no longer were producing seeds. Recent remeasurement of a subset of the 1990s plots showed that mortality of whitebark pine trees has more than doubled in the past two decades (considering mortality due to all factors, including mountain pine beetle). Despite this loss, the NCDE grizzly bear population is increasing (Costello et al., 2016), illustrating the flexibility of grizzly bear diets and the high habitat diversity in the NCDE (USFWS, 2013). The Forest Service knows of no science indicating that conflict rates, reproductive success, or litter sizes for the NCDE grizzly bear population have been impacted by whitebark pine losses in the NCDE.

The revised Flathead forest plan includes direction designed to maintain or restore whitebark pine as much as possible, with desired conditions (FW-DC-PLANT-03 and 04) to sustain the habitats occupied by this species and protect individual whitebark pine trees and stands that have been identified as important in the species' recovery (such as cone-producing trees and plantations) and an objective (FW-OBJ-PLANT-01) to treat 8,000 to 19,000 acres over the life of the plan for the purpose of sustaining or restoring whitebark pine. The Forest has an ongoing program of whitebark pine restoration activities, including the collection of seed, scion, and pollen from mature trees that display resistance to rust; the planting of whitebark pine seedlings; and thinning (see final EIS, section 3.5.1, subsection "Whitebark pine restoration strategy"). See also the comments and responses under Vegetation Management—Whitebark Pine.

The mountain pine beetle is a native insect, and outbreaks have occurred periodically in historical times as well as in more recent times. Beetles are active nearly every year, although at relatively low levels in most years. As the commenter mentioned, over the past 40 years there have been outbreaks in portions of the Flathead National Forest, causing high mortality in areas with large expanses of susceptible forests. Currently, as is shown in figure 9 of the final EIS, about 14 percent of the Forest is rated moderate to high hazard to mountain pine beetle, based on forest conditions. Whether an outbreak will occur depends on a number of factors, including weather and climatic conditions. As the commenter noted, whitebark pine is a host species of mountain pine beetle, and the beetle has contributed to the decline of whitebark pine. Creating suitable sites for new whitebark pine regeneration (such as by prescribed burning) or thinning and pruning in stands of sapling-size whitebark pine to reduce susceptibility to insects, disease, and fire are some treatments that may be done to achieve the objective in the forest plan for whitebark pine restoration (FW-OBJ-PLANT-01).

2. Extending the vegetation management direction to the demographic connectivity areas was analyzed under alternative 3/alternative C. The preferred alternatives (alternative 2 modified for the amendment forests and alternative B modified for the Flathead National Forest) include a desired condition (NCDE-DC-WL-02, FW-DC-WL-02) that states that "grizzly bear habitat on NFS lands contributes to sustaining recovery of the grizzly bear population in the NCDE and contributes to connectivity with neighboring grizzly bear recovery zones." This desired condition applies to zone 1, including the demographic connectivity areas.

3. The vegetation management guidelines apply to the primary conservation area under alternative 1/alternative A and are extended to the demographic connectivity areas under alternative 3/alternative C. Extending habitat standards and guidelines to zone 2 is discussed in section 5.6.5 of the final EIS as an alternative considered but eliminated from detailed study. Grizzly bears are expected to occur at lower densities in zone 1 and zone 2, with management efforts focused on preventing conflicts and grizzly bear mortalities. Grizzly bears have been reoccupying zones 1 and 2 at lower densities than in the recovery area/primary conservation area,

as expected, and additional plan components for vegetation management do not appear to be needed to support the grizzly bear management goals in zones 1 and 2.

4. Guideline NCDE-GDL-VEG-03 addresses cover and is included with some variation in alternative 2/alternative B modified and alternative 3/alternative C. In addition, a cover guideline for riparian management zones is included in alternative B modified for the Flathead National Forest's forest plan (FW-GDL-RMZ-09).

5. The wording of this guideline concerning seed mixes was modified from the proposed action to the draft EIS. The guideline as written in the draft EIS and the final EIS does apply to the primary conservation area, zone 1, and the demographic connectivity areas under all action alternatives.

6. As described in the recovery plan (USFWS, 1993), grizzly bears are an omnivorous and opportunistic species, with available food sources varying annually, seasonally, and even day to day. The abundance and distribution of food resources, availability of cover and denning sites, levels and types of human activities, grizzly bear social dynamics, learned behavior of individual grizzly bears, and annual weather are important variables influencing the accessibility of foods for bears. Because of the complexity and interactions of these variables, it is not possible to quantify habitat carrying capacity for grizzly bears. Research has shown that grizzly bears in the NCDE occupy numerous different habitat types and forage in open areas but generally prefer to forage in areas with some type of hiding cover nearby, particularly in daylight hours (Aune & Kasworm, 1989; Waller & Mace, 1997). A mosaic of vegetation providing forage and cover is desirable, but because of the complexity described above, the Forest Service is not able to quantify habitat quality or quantity in a programmatic desired condition in the forest plan. The guidelines referenced in the comment provide an example (e.g., promoting the growth of berry-producing shrubs, forbs, or grasses known to be bear foods in areas where it would not increase the risk of grizzly bear-human conflicts); this is based upon the interagency grizzly bear guidelines (IGBC, 1986). Because the quality and quantity of bear foods change from site to site and year to year, site-specific analysis is necessary to apply the vegetation guidelines, and they are best addressed when projects are implemented.

7. See the comments and responses under Non-Native Invasive Species—Management and Treatment.

Heritage Resources

Heritage Resources—General

Comment (letter numbers 217, 3021, 3042)

The desired conditions regarding the Forest Backcountry Administrative Facilities Historic District (in the GA-MF-DC and GA-SF-DC sections in the forest plan) should be moved to the cultural resources section of the plan.

The forest plan should acknowledge that there are potentially more than the 75 known Native American archaeological sites.

The Forest has significant cultural resources.

Response

The Forest Backcountry Administrative Facilities Historic District is located in the Middle Fork and South Fork geographic areas. Because this is not a forestwide historic district, the location of these desired conditions in the GA-MF-DC and GA-SF-DC sections of the forest plan is appropriate and has not been changed.

The Forest agrees that the introduction to the draft forest plan did not make it clear that the numbers of cultural resources given for the Forest were for known sites only. This has been clarified in the forest plan.

The Forest recognizes the importance of the identification and protection of the known and unknown cultural resources on the Forest. Laws, regulations, the programmatic agreement with the Montana State Historic Preservation Office for Section 106 compliance (USDA, 2015d), and the forest plan contain programmatic direction regarding the identification and protection of the Forest's cultural resources. In the forest plan, see the desired conditions, objectives, and guidelines provided in the Cultural Resources and the Areas of Tribal Importance sections.

Heritage Resources—Surveys Objectives and Desired Conditions

Comment (letter numbers 2591, 3021, 3097)

The Flathead National Forest should protect known and potential historic and prehistoric resources on the Forest through increased cultural resource surveys, inventories, minimum needs assessments, management plans for traditional cultural areas and properties, monitoring, and employee and volunteer training.

Response

The Forest agrees that the identification and protection of cultural resources on the Forest is important. Laws, regulations, the programmatic agreement with the Montana State Historic Preservation Office for section 106 compliance, and the forest plan contain programmatic direction regarding the identification and protection of the Forest's cultural resources, including traditional cultural properties. In the forest plan, see the desired conditions, objectives, and guidelines provided in the Cultural Resources and the Areas of Tribal Importance sections. These specifically address the protection and maintenance of site significance and integrity, preservation plans, traditional cultural properties, cultural landscapes, sacred sites, and a proposed cooperatively established tribal consultation protocol.

Funding for surveying, evaluating, and protecting known and potential prehistoric and historic sites to meet the desired conditions will continue to be a challenge. The objectives in the forest plan are based largely on the Forest's current and recent budget levels, which are expected to stay relatively flat or to decrease. The objectives are realistic projections of what the Forest expects to accomplish annually or over the life of the plan.

Site-specific plans related to how surveys are conducted and known sites are evaluated and protected are determined at the project scale. For all individual Forest projects, the areas are inventoried for historic properties prior to a final decision to proceed. Determinations of eligibility and findings of effect are completed. If required, consultation is also completed with both the Montana State Historic Preservation Office and relevant Native American tribes.

Most Forest Service backcountry facilities in the South Fork have been evaluated for eligibility to the National Register of Historic Places. Eligibility evaluations of other historic Forest Service administrative facilities will be completed as required by cultural resources laws, regulations, and

established USDA and Forest Service policies or as heritage program funding becomes available. In the forest plan, see FW-DC-CR-06, FW-OBJ-CR-01, and FW-OBJ-CR-02, which address inventories and evaluations of potentially eligible historic properties.

The following potential management approach has been added to appendix C of the forest plan: “Providing ongoing training to Forest employees and volunteers to help ensure that management activities do not damage known or potential cultural resources.”

Heritage Resources—Traditional and Spiritual Uses

Comment (letter number 2821)

The forest plan should address the effects of the Forest’s land management decisions on the spirituality and religious practices of the Blackfeet and the Confederated Salish and Kootenai Tribes. It should also address the tribes’ views of grizzly bears, buffalos, and wolves as their people/brothers.

Response

The Forest understands its tribal trust responsibility and recognizes the need to ensure tribal members access to the Forest to provide opportunities to practice traditional cultural and religious activities (see FW-DC-TRIB-02 and FW-DC-IFS-12). The forest plan includes the desired conditions that culturally significant species of plants and animals and their habitats are maintained to ensure that rights reserved by tribes are not significantly diminished (FW-DC-TRIB-01) and that vegetation conditions provide forest products such as medicinal plants and tepee poles for tribal use (FW-DC-TE&V-05).

The forest plan provides programmatic direction related to the identification and protection of traditional cultural properties through tribal consultation, and developing a cooperatively established tribal consultation protocol is an objective (see FW-DC-CR-01, FW-DC-CR-02, FW-OBJ-TRIB-01, and FW-OBJ-TRIB-02). The Forest adheres to all relevant Federal laws, including the Antiquities Act of 1906, the American Indian Religious Freedom Act of 1996, Executive Order 13007 of 1996 (Indian Sacred Sites), the National Historic Preservation Act of 1966, the Archaeological Resources Protection Act of 1979, Executive Order 11593 (Protection and Enhancement of the Cultural Environment), Executive Order 13084 (Consultation with Indian Tribal Governments), and the Forest Service Handbook (6209.13, 11.2, 11.22), which describes the exemption of the location and nature of archaeological and historic sites from disclosure under the Freedom of Information Act.

The plan addresses ecological conditions needed to sustain the diversity of wildlife species. The grizzly bear was listed as a threatened species in the lower 48 states in 1975 under the Endangered Species Act. Under all alternatives, the grizzly bear and its habitat would continue to be managed and protected in accordance with applicable laws and policy requirements.

Thank you for attaching the United Nations Declaration on the Rights of Indigenous Peoples. The Forest adheres to and complies with all relevant cultural resources laws and regulations and established USDA and Forest Service policies.

Infrastructure

Infrastructure—Facilities

Comment (letter numbers 217, 242)

The Forest should include the following desired condition in management area 1a (designated wilderness): Facilities and structures with significant historic value may be maintained where determined that the facility or structure is deemed necessary for the administration of the area pursuant to the Wilderness Act.

The Forest should add a vault toilet across from the Challenge Creek Cabin.

Response

Direction on this topic is provided in Forest Service Handbook 2320, section 2324.3—Management of Structures and Improvements. Alternative B modified includes the following two desired conditions regarding facilities in the wilderness that are site-specific to the Flathead National Forest:

- MA1a-DC-03: Facilities in the Bob Marshall and Great Bear Wilderness areas provide for the protection and management of the wilderness resource.
- GA-SF-DC-02: The Forest Backcountry Administrative Facilities Historic District adjacent to and within the Bob Marshall and Great Bear Wilderness Areas provides recognition for national and regional wilderness and land management history.

The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Adding a toilet across from the Challenge Creek Cabin is a site-specific activity.

Infrastructure—Logging Roads

Comment (letter number 3009)

New road construction should be limited in management areas 6a, 6b, and 6c (general forest low-to high-intensity vegetation management). New roads constructed for timber harvest should be reclaimed after treatments are completed to keep road density stable. Construction of new roads should be minimized when salvage harvesting in burned forest.

Response

Under all the action alternatives, forestwide standards limit total motorized route density within the recovery zone/primary conservation area for grizzly bears (FW-STD-IFS-02) and the open motorized route density in the Salish Mountains geographic area (SM-STD-01). The amount of road construction within management areas 6a, 6b, and 6c will be determined at the site-specific project level. The project analysis will determine the effects of new road construction and whether any road management actions are needed as part of the project. This is also true of any salvage harvest in burned areas.

Infrastructure—Phone Lines

Comment (letter number 3097)

The Forest should complete an objective minimum needs requirement analysis for the historic phone line in the South Fork and for all of the administrative and outfitter facilities.

The Forest should revise the plan components for the South Fork geographic area because the plan components related to maintaining the historic phone line, managing facilities for recognition, and providing access to Spotted Bear and Meadow Creek airstrips is not aligned with the desired condition of managing the wilderness for natural processes nor of managing it to meet the limits of acceptable change standards.

The Forest should revise the objective to maintain 40 miles of phone line as this does not seem like a priority compared to maintaining trails, monitoring limits of acceptable change standards, and determining a plan to meet the limits of acceptable change standards that have never been met in many areas.

Response

A minimum needs requirement analysis is outside the scope of the forest plan revision.

Alternative B modified includes plan components for the South Fork geographic area to maintain the historic phone line, manage backcountry facilities, and provide access to the Spotted Bear and Meadow Creek Airstrips. But the forest plan also includes desired conditions for designated wilderness, such as the following:

- Designated wilderness areas are managed to preserve and protect their wilderness character as required by the Wilderness Act and each wilderness area's enabling legislation.
- Wilderness character includes the qualities of untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, and other features of value (ecological, geological, scientific, scenic, or historic value unique to each specific wilderness area).
- Natural ecological processes and disturbances (e.g., succession, wildfire, avalanches, insects, and disease) are the primary forces affecting the composition, structure, and pattern of vegetation. Wilderness areas provide opportunities for visitors to experience natural ecological processes and disturbances with a limited amount of human influence.

The preferred alternative does not prioritize phone line maintenance over trail maintenance. Alternative B modified includes the objective to maintain 40 miles of the historic phone line in the South Fork geographic area but also includes forestwide infrastructure objectives to maintain up to 2,260 miles of NFS trails, annually reconstruct 25 to 30 miles of trails, and reduce the deferred trail maintenance backlog by 10-25 percent. It also includes the desired condition that the current trail system in the Bob Marshall, Mission Mountains, and Great Bear Wilderness Areas on the Forest is managed to provide for wilderness experience. See the monitoring items for designated wilderness in chapter 5 of the forest plan.

Infrastructure—Roads, General

Comment (letter numbers 51, 2904, 3094, 3271)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. There needs to be adequate public disclosure of the forest plan's effects on motorized recreation. The Forest should evaluate and disclose during the decisionmaking process the cumulative negative impact of past planning actions on motorized recreationists.
2. The Forest should analyze its road system as part of the forest plan revision process and should consider recommendations outlined in the travel analysis report.
3. The Forest should include more plan components for road density, design, management, monitoring, maintenance, and decommissioning and should increase the objective for the number of miles of roads to be decommissioned.

Response

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The final EIS includes a discussion of the cumulative effects of road decommissioning and road closures, wheeled trail closures, and motorized over-snow vehicle closures on motorized recreation on the Forest.

Through the public involvement process in developing the forest plan, the Forest had discussions with the public on motorized recreation opportunities along with other issues. Section 3.5.2 of the final EIS presents information on current motorized access opportunities. The alternatives provide for a variety of recreation opportunities, with some alternatives providing less and others more opportunities for motorized use. See section 3.5.3 in the final EIS for disclosure of these effects. Alternative D presents the most opportunities for motorized opportunity and alternative C provides the least.

Section 3.10.3 now includes a discussion in the cumulative effects section on the effects of past travel management decisions on motorized recreation.

2. The Forest used recommendations from the Flathead National Forest's Travel Analysis Report (USDA, 2014c) to inform the objectives on miles of roads to be decommissioned or placed into stored service in the forest plan (FW-OBJ-IFS-01 and GA-SV-OBJ-04). This has been documented in section 3.12 of the final EIS. The Travel Analysis Report does not make any site-specific decisions. Rather, the analysis helps to inform Forest managers as they identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands in response to road and travel management regulations in 36 CFR 212. This broad-scale analysis encompasses all existing National Forest System roads on the Flathead National Forest. The report provides an assessment of the road infrastructure and a set of findings and opportunities for change to the Forest's transportation system.

3. The commenter did not suggest any specific additional standards, guidelines, or objectives for roads. The forest plan contains adequate direction for roads, including desired conditions and objectives for maintenance, standards for density, and monitoring items. The number of miles of road to be decommissioned in objective FW-OBJ-IFS-01 took into consideration the need to manage the National Forest System roads to achieve the minimum road system based on the Forest's Travel Analysis Report (USDA, 2014c), and it is within reasonably foreseeable budgets.

Infrastructure—Roads, Guidelines

Comment (letter number 2574)

Instead of guidelines FW-GDL-IFS-03, 11, 14, and 15, the Forest should adopt and implement the Montana forestry best management practices as this would be more comprehensive and would result in better consistency in project implementation.

Response

Forestwide standard FW-STD-WTR-02 is included in the selected alternative. This standard states that Federal and State of Montana best management practices shall be incorporated into project plans.

Infrastructure—Roads, Maintenance

Comment (letter numbers 44, 108, 2574, 2904)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should quit skimming 55 percent off the top of road maintenance funds for timber support and put it directly to work maintaining roads.
2. The Forest should make sure that the objective of maintaining 1,200 miles of levels 2 through 5 roads (FW-OBJ-IFS-03) is in alignment with its reasonably foreseeable financial resources.
3. The Forest should include a plan component for a sustainable road system.
4. The Forest should clarify the standard of no sidecast of material into waterbodies or drainage structures (FW-STD-IFS-06). Sidecast of material is often required in constructing a road when cut and fill is required.

Response

1. The Forest's Travel Analysis Report (USDA, 2014c) determined that approximately 55 percent (revised to 65 percent in the report) of the Forest's annual roads funding is reserved for timber sale engineering support and planning and the remaining 45 percent (revised to 35 percent) is available for all road inventory, monitoring, analysis, contract administration, construction, operations, and maintenance. This funding allocation is based on the program of work as set by the Forest Service's regional and national office. It is outside the scope of the forest plan revision to set the annual program of work based on the budget.
2. The 1,200-mile figure has been adjusted slightly downward and to an annual amount in the forest plan. The figure is based on a reasonably foreseeable budget.
3. The Forest has many plan components regarding the NFS road system and its sustainability. The FW-DC-IFS 03 provides overarching direction that the Forest should provide public access to NFS lands and that a well-planned cooperative road system should provide improved and cost-effective access to not only NFS lands but also interspersed private and State lands.
4. This standard has been adjusted in the final plan to apply to areas within or adjacent to riparian management zones. Within these areas, any side-casted material would have to be hauled out.

Infrastructure—Roads, Minimum Road System

Comment (letter numbers 36, 44, 128, 249, 290, 324, 2869, 2894, 2987, 3296)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should have a smaller, financially sustainable road system that fits within the agency's limited budget and minimizes damage to the forest's natural resources and wildlife. The forest plan should include plan components for achieving this smaller road system.
2. More roads should be decommissioned, especially adjacent to wilderness or within grizzly bear habitat.

Response

1. The Forest has many plan components regarding the NFS road system. The desired condition FW-DC-IFS 03 provides overarching direction that the Forest provides public access to NFS lands and that a well-planned cooperative road system provides improved and cost-effective access to not only NFS but interspersed private and State lands. Objectives such as FW-OBJ-IFS-01 and GA-SV-OBJ-04 for the decommissioning, maintenance, and reconstruction of roads trend the Forest towards this desired condition.
2. The amount of road decommissioning in FW-OBJ-IFS 01 is based on the estimated need for decommissioning to meet multiple use and resource desired conditions and is within reasonably foreseeable budgets. Priority is given to roads causing resource damage in priority watersheds and/or roads located within desired nonmotorized recreation opportunity spectrum settings and/or roads within bull trout watersheds.

Infrastructure—Roads, Subpart A

Comment (letter number 2904)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The draft EIS makes no mention of 36 CFR 212 subpart A, the travel analysis report, or minimum road system. The Forest must consider its duties under subpart A of the Roads Rule as part of its analysis of infrastructure. The Forest should consider wording the desired condition (FW-DC-IFS-03 in the May 2016 draft forest plan) as follows: Public access is provided to NFS lands. A well-planned cooperative road system provides improved and cost efficient access to not only NFS but interspersed private and state lands) is consistent with the subpart A duties and the recommendations set forth in its travel analysis report.
2. The Forest should define what a "well-defined road system" is and state why this goal would achieve the agency's substantive duties under subpart A.

Response

1. The 36 CFR 212 regulation has been added to the list of laws and regulations in section 3.12 in the final EIS. A discussion has also been added to section 3.12.2 in the final EIS to describe the Forest's Travel Analysis Report that was completed in 2014 (USDA, 2014c) and management to move the Forest towards the minimum road system. The forest plan does not make site-specific

travel management decisions. This analysis occurs at the project level, with decisions following site-specific NEPA. The ongoing project-scale roads analysis continues to prioritize road maintenance, road restoration, or decommissioning based on the results of the Forest's Travel Analysis Report.

The desired condition is consistent with the Forest Travel Analysis Report and 36 CFR 212 subpart A. The direction to identify the minimum road system is found in the Code of Federal Regulations (36 CFR 212), Forest Service Manual 7710, and Forest Service Handbook 7709.55; repeating this direction in the forest plan is unnecessary.

2. The phrase "well-defined road system" is one of several descriptions of the roaded natural recreation opportunity spectrum class. Well-defined could be described as "distinct" or "clearly marked." The roads within a roaded natural recreation opportunity spectrum class typically accommodate sedan traffic. See the glossary under recreation opportunity spectrum for a definition of roaded natural. Management actions or goals would be to maintain the roaded natural recreation opportunity spectrum class. The direction in 36 CFR 212 subpart A does not pertain to recreation opportunity spectrum classes.

Infrastructure—Roads, Wildlife and Aquatic Impacts

Comment (letter numbers 44, 108, 2904, 2995, 3080)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The road closure, reclamation, and culvert monitoring programs developed for bull trout and grizzly bear should apply across the entire Flathead National Forest so the benefits are extended to all fish and wildlife and are not dependent upon Endangered Species Act listings and protections.
2. In desired condition FW-DC-IFS-15, "substantial risk" to aquatic resources posed by roads is not defined. Although this is a desirable condition, the final plan needs to present a set of standards that ensures roads that do pose a "substantial risk" are identified and the risk is addressed. This may be covered by FW-OBJ-IFS-01.
3. The Forest is not maintaining its existing road and trail system, and this situation is likely to continue to deteriorate into the future. The Forest is still choosing to weaken its management of roads in the forest plan in ways that are sure to harm bull trout and their habitat.
4. The agency fails to consider financial projections from the Forest's Travel Analysis Report (USDA, 2014c). The Forest Service concludes, without providing justification or analysis of the impacts, that under all of the alternatives the road management will support a recovered grizzly bear population. The agency fails to consider impacts from roads to wildlife other than grizzly bear, including big game such as elk and deer. It fails to consider the impacts from continued use of existing roads on water quality and aquatic life. The Forest Service fails to address how the adverse impacts from roads are likely to be exacerbated by climate change effects.
5. The Forest Service misrepresents past road management efforts. When discussing the effects from infrastructure on soil, the draft EIS states, "Over the last twenty years, about 19 miles of road was built while about 787 miles of road was decommissioned" (vol. 1, p. 76). It fails to mention the additions to the NFS road system, including new roads for logging (19 miles) and land acquisitions (411 miles). In sum, the agency has reduced its road mileage by only 357 miles.

The Forest Service's omission of these additional facts in its analysis of soil impacts paints an unfair comparison that prevents meaningful public comment.

6. The number of "roadless miles" in the Forest must not be reduced. Reduction would lead to longer periods of time to receive emergency services and the inability to effectively suppress wildfires. It would also increase the cost of future timber sales or timber management. Addressing stream-crossing issues would improve riparian habitat without having a significant impact upon other forest management tools.

Response

1. The road closure, reclamation, and culvert monitoring programs are applied across the Forest where bull trout are present, and amendment 19 is applied to grizzly bears under the 1986 forest plan. Access management and associated monitoring would continue across the Forest under the forest plan, with priority given to bull trout watersheds and grizzly bears within the primary conservation area. The Swan Island Unit and Tally Lake Ranger District would be lower priorities for bull trout and grizzly bears, but road closures, reclamation, and monitoring would still occur for other resource objectives such as elk security and westslope cutthroat trout. Road closure standards for the grizzly bear apply to the recovery zone/primary conservation area and to zone 1 (including the Salish demographic connectivity area). These areas encompass the Flathead National Forest. Plan components for access management and monitoring would apply whether or not the grizzly bear and the bull trout are listed under the Endangered Species Act.

2. The Forest agrees with this comment and has dropped FW-DC-IFS 15 in the forest plan.

3. The forest plan has standards and guidelines designed to address the impacts that roads may have on bull trout and aquatic resources. Two important plan components under infrastructure that are designed to minimize sediment input from roads are FW-GDL-IFS-03 and 04:

- 03 Roads, skid trails, temporary roads, and trails should have water drainage systems that possess minimal hydrological connectivity to waterbodies (except at designated stream crossings) to maintain the hydrologic integrity of watersheds and protect them from the delivery of water, sediment, and pollutants.
- 04 To reduce the risk to aquatic resources when decommissioning roads, making roads impassable, or storing roads, roads should be left in a hydrologically stable condition, e.g., drainage off roads should be routed away from resources and landslide prone areas and towards stable areas of the forest floor to provide filtering and infiltration.

In addition, FW-GDL-CWN-01 restricts net increases in stream crossings and roads in riparian areas within bull trout watersheds and important westslope cutthroat trout watersheds: "To reduce sedimentation, for subwatersheds included in the Conservation Watershed Network, net increases in stream crossings and road lengths should be avoided in riparian management zones unless the net increase improves ecological function in aquatic ecosystems. The net increase is measured from the beginning to the end of each project."

Also, objectives FW-OBJ-CWN-01 and 02 will reduce sediment from potential culvert failure by stormproofing the road network within bull trout watersheds.

- 01 The Conservation Watershed Network is the highest priority for restoration actions for native fish and other aquatic species. The stormproofing of 15 to 30 percent of the roads in the Conservation Watershed Network is prioritized, as funding allows, to benefit aquatic

species (e.g., bull trout). See appendix C for specific strategies for treatment options and for prioritization, such as of roads paralleling streams vs. ridgetop roads.

- 02 Over the life of the plan, stormproofing the transportation system (e.g., upsizing culverts, reducing sediment on roads, realigning stream-constraining road segments, etc.) will be accomplished as opportunities are identified on the following prioritized subwatersheds: Sullivan Creek, Wounded Buck Creek, Trail Creek in the North Fork, Whale Creek (includes Upper Whale, Lower Whale, and Shorty Creeks), Granite Creek, Bear Creek, Goat Creek, and Lion Creek.

4. Plan components provide for the conservation of grizzly bears as well as for the security of deer and elk (see also comments and responses under Wildlife—Elk Habitat, Impacts of Roads and Trails and Grizzly Bear—Concerns about Delisting). Effects of roads and changes in climate are discussed in sections 3.7.4 and 3.7.5 of the final EIS for multiple wildlife species, not just the grizzly bear. The conservation watershed network considers climate change and addresses roads by stormproofing them in the face of climate change. The final EIS discloses that the Forest anticipates larger fall rain events; the Forest would upsize its culverts to address potential larger flows.

5. This comment takes the soils analysis out of context. In the Soil environmental consequences section, under the subheading “Stressors,” the following is stated in the draft EIS:

The network in the early 1990s was 3,842 miles whereas now system roads account for 3,566 miles as of 2014. The difference is actually much more striking since road decommissioning has taken off the template 787 miles of classified roads from 1995 through 2015.

The same statement occurs in the final EIS, except the miles of system roads have been updated, based on more recent information, to 3,559 miles as of 2016. The total miles of system road does take into account the 411 miles acquired from Plum Creek Timber Company (now Weyerhaeuser).

6. It is not clear whether this comment is referring to roadless areas that are unroaded or whether it is referring to the number of miles of existing roads, but the latter appears to be correct. The decisionmaker selected an appropriate mix of plan components to provide for social, economic, and ecological sustainability. The forest plan objectives, such as FW-OBJ-IFS-01 and GA-SV-OBJ-04, would result in a reduction in roads. When developing these objectives, the Forest considered the Travel Analysis Report (USDA, 2014c), public input, other agency input, and the best available scientific information. As site-specific projects are developed, the Forest would consider access and the time to render emergency services, the need to suppress wildfires, and the cost of future timber management.

Infrastructure—Stream Crossings

Comment (letter number 44)

The Forest should have plan components to inventory all stream-crossing structures on the Forest and include them in the INFRA database in a manner that ensures inspections and makes sure that problems and repairs are fully accounted for and easily traceable. The Forest should commit to the annual inspection and necessary cleaning of all stream-crossing structures.

Response

Alternative B modified contains adequate direction for stream-crossing structures. Stream-crossing structures are entered into the INFRA database and are inspected and maintained as needed, based on budget and program management priorities.

Lands and Special Uses

Lands and Special Uses—Forest Plan Components

Comment (letter numbers 2574, 2849, 2851, 2904)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should recognize in the final plan that proposed trail corridors (for trails in the Blacktail Mountain vicinity and Whitefish Mountain vicinity) may cross private lands. Easements and agreements across the private lands must be in place prior to the Forest Service promoting the trail on NFS lands to avoid unnecessarily contributing to trespass issues on private lands (see GA-SM-OBJ 02, GA-SM-MA7-Big Mtn-06, GA-SM-MA7-Blacktail Ski DC-02 and Blacktail OBJ-01, alternative D GA-SM-MA7, and Blacktail Foys-DC 01).
2. The Forest should include strategic objectives in the forest plan that state that commercial recreational use permits should have a streamlined pathway that makes issuance a priority.
3. The Forest should have standards or guidelines for leases, permits, rights-of-way, or easements in relation to riparian areas.
4. The Flathead should have standards regarding land acquisition and exchange and conservation easements to meet riparian management objectives and facilitate the restoration of fish stocks and other species at risk of extinction (similar to INFISH's LH-4).

Response

The Forest's intent is to route trails only on NFS lands in order not have to acquire easements and/or agreements to achieve its objectives. Where this becomes impossible, the Forest will work with local landowners to pursue agreements and/or easements, and if agreement is not possible, then route objectives will not be pursued further.

In forest plans, an objective is a concise, measurable, and time-specific statement of a desired rate of progress towards a desired condition or conditions based on reasonably foreseeable budgets. Objectives are designed to make progress towards attaining desired conditions; they must be clearly stated in measurable terms with specific and reasonable timeframes; and they should be expressed in terms of outcomes, not actions.

The forest plan has plan components pertaining to leases, permits, rights-of-way, or easements in relation to riparian management zones, but there are no specific plan components regarding acquisition for fisheries because the Forest manages the critical habitat and spawning reaches for bull trout throughout the Flathead River Basin. The Forest will continue to use the Land and Water Conservation Fund to purchase lands as opportunities arise.

Lands and Special Uses—General

Comment (letter number 2832)

The Forest should design a forest plan that is flexible enough to adapt to ever-changing circumstances in relation to resources and policy and in keeping with the wishes of local citizens and communities. Land use designations should be based on the capacity of the land and suitability for uses, not on current restrictions, regulations, or management directives that could change based on new policy or science. The forest plan must recognize the Forest's "good neighbor" responsibility so that private landowners are not adversely impacted by neighboring national forest land in need of treatment.

Response

The Forest Service is directed under the Multiple-Use Sustained-Yield Act of 1960 to manage the renewable resources of timber, range, water, recreation, and wildlife on the national forests for multiple use and sustained yield of products and services. The forest plan design and direction reflects the Forest's attempt to provide the appropriate mix of multiple uses, based on the capability of the land and the desires of the "owners" of the land—including local citizens but also the citizens of the rest of the United States. The plan also must be consistent with all applicable laws, regulations, and policy, as well as with the new direction provided by the 2012 planning rule and Forest Service directives that implement the rule. That science, policy, regulations, or other factors may change in the future is a given, and if needed the forest plan will be revised or amended, as has occurred over 20 times in the 30 years that the current plan has been in operation. The concept of adaptive management—learning as we go and adjusting management if needed based on what we learn—is integral to the 2012 planning rule and directives.

Litigation and Objections

Comment (letter numbers 44, 2842, 2864, 3050)

The Forest "needs to make the collaborative process more successful to help end tiresome and endless litigation." Conversely, the Forest should "recognize litigation is as important as collaboration in helping guide the agency." In addition, because the Forest did not identify a preferred alternative in the draft EIS, "The public is now left with nothing but the formal objection process to make their lingering concerns known to the Forest Service."

Response

The opportunities for public participation were developed early on in the planning process due to both the collaborative and science-based nature of the forest plan revision process under the 2012 planning rule. There were many opportunities for the public to participate, including attending public meetings across western Montana, offering comments on web-based narrative and mapping, providing scoping comments on a detailed proposed action, and providing comments on detailed alternatives. A number of community members participated in Forest Service or other collaborative efforts, and their input is reflected in the forest plan. The Forest Service did not identify a preferred alternative when the draft EIS was released because it simply did not have a clearly identified preferred alternative. Through a careful consideration of the comments received, a preferred alternative (alternative B modified) has been identified that is within the range of alternatives analyzed in the draft EIS.

The objection process gives an individual or entity an opportunity for an independent Forest Service review and resolution of issues before the approval of the plan revision, building on early

participation and collaboration efforts, with the intention of resolving concerns before a decision is made.

The Forest Service believes providing a pre-decisional objection opportunity allows the reviewing officer, the responsible official, objectors, and other interested persons to have open communication, to understand issues, and to consider resolution, which aligns with the Forest's collaborative approach to forest management. Considering public concerns before a final decision is made increases the likelihood of resolving those concerns, resulting in better, more informed decisions. Engaging diverse perspectives and potential contributions of people across the country early and throughout the planning process is essential to caring for the land and serving people. This approach complements public engagement efforts to bring divergent viewpoints together to foster national forest management designed and accomplished in partnership with the public.

Management Areas

Most of the comments on management areas express the desire for particular management area allocations to be included in the forest plan. In making the decision, the responsible official will consider all these comments and points of view with the intent of providing for an assortment of multiple uses of the Flathead National Forest. The rationale for the decision is outlined in the record of decision. The alternatives in the final EIS represent a range of possible management options and management allocations for evaluation, responding to the issues and public comment. Section 2.2 in the final EIS describes the development of alternatives, including a description of the alternatives that were not considered in detail. Most of the responses in this section identify and clarify the management area allocations that occur in alternative B modified, the preferred alternative. Also see responses to comments under the section entitled Alternatives.

Management Area 1—General

Comment (letter numbers 2879, 2984, 3097)

The Forest should map the area on the east side of the South Fork of the Flathead River from the wilderness boundary to four miles north as recommended wilderness and recommended wilderness from the current wilderness boundary west across the South Fork of the Flathead River to the east edge of Meadow Creek Road, excluding the airstrip from the wilderness and making that management area 5a.

The Forest should edit MA1a-DC-01 to: Wilderness areas are managed to protect wilderness character as required by the Wilderness Act and the wilderness areas' enabling legislation. Wilderness character refers to conditions that management should protect. Wilderness character includes the following: untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation and other features of value such as ecological, geological, scientific, scenic, or historic.

The Forest should edit MA1a-DC-04 to: Non-native invasive species are non-existent or in low abundance and do not disrupt ecological functions. Emphasis will be placed on actions to prevent the introduction of non-native species.

Response

The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas recommended in this decision are an appropriate vision for the Flathead

National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

Changes were made to this desired condition (MA1a-DC-01) in the final forest plan so that it now states: “Wilderness areas are managed to preserve and protect their wilderness character required by the Wilderness Act and each wilderness area’s enabling legislation. Wilderness character includes the following qualities of untrammeled, natural, undeveloped, opportunities for solitude or a primitive and unconfined type of recreation, and other features of value (ecological, geological, scientific, scenic, or historic value unique to each specific wilderness area).”

A desired condition is a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, towards which management of the land and resources should be directed. Desired conditions do not contain action items such as the statement that emphasis will be placed on actions to prevent the introduction of non-native species. Therefore, your suggested change to the desired condition was not made in the forest plan. However, the desired condition continues to identify wilderness areas as one of the priority areas for focusing on conditions related to invasive plant species. The objective for non-native invasive plants (FW-OBJ-NNIP-01) has changed to emphasize treatment in priority areas, with the addition of this statement: “Greatest attention will be given to treating potential invaders or new invaders most likely to negatively impact native plant communities and ecosystem integrity, especially in areas identified as high priority.” In addition, there are a number of other plan components for non-native plant species, such as desired condition FW-DC-NNIP-02: No new non-native invasive plant species become established in terrestrial or aquatic plant communities on the Forest.” Desired condition FW-DC-NNIP-03 states: Terrestrial communities at risk of negative impacts from non-native invasive plants are able to retain or regain function, process, and structure after disturbance.

Management Area 1a—Wilderness

Comment (letter numbers 217, 2879, 2984, 3042, 3097)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should edit the first management area 1 desired condition (MA1a-DC-01) to: Wilderness areas are managed to provide for wilderness character as defined by the Wilderness Act and the wilderness areas’ enabling legislation. Wilderness character, as described in the Wilderness Act, can be defined through several qualities which are: untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, and may include other features of value such as ecological, geological, scientific, scenic, or historic.

The Forest should have plan components that support wilderness “untrammeled,” “natural,” “undeveloped,” and “solitude or primitive and unconfined recreation” desired conditions by adding a standard to address wilderness character core components. The Minimum Requirements Decision Guide is applied to management actions addressing potential effects of proposed actions on wilderness character, including untrammeled, naturalness, undeveloped, and outstanding opportunities for solitude or a primitive and unconfined type of recreation.

2. The Forest should edit the fifth desired condition (MA1a-DC-05) to: The current NFS trails in the Bob Marshall, Mission Mountains, and Great Bear Wilderness areas on the Forest are managed to provide for a wilderness experience not exceeding a designed use of Trail Class 3.

3. The Forest should edit the seventh desired condition (MA1a-DC-07) to: Outfitter and guide service opportunities are maintained in the Bob Marshall Wilderness Complex as determined by identified public need.
4. The Forest should not allow facilities in the Bob Marshall and Great Bear Wilderness areas.
5. The Forest should add this guideline: When wildland fires occur, appropriate response strategies should be based in part on wilderness untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation considerations, and the risk of a fire event spreading to developed areas outside of wilderness.
6. The Forest should change standards regarding group sizes in the Bob Marshall and Great Bear Wilderness Areas because the current limit of 35 head of stock is too high and allows some users to cause a disproportionate impact on the wilderness resource.
7. The Forest should do a current minimum needs assessment as part of the forest plan revision process on facilities such as work centers, cabins, dwellings, bunkhouses, tool sheds, barns, outhouses, lookouts, corrals, hitch rails, bridges, etc., as well as outfitter corrals, hitch rails, and outhouses.
8. The Forest should include limits of acceptable change standards in the plan and monitor them and make them available to the public.

Response

1. The MA1a-DC-01 plan component has been revised in the forest plan and now reads: “Designated wilderness areas are managed to preserve and protect their wilderness character as required by the Wilderness Act and each wilderness area’s enabling legislation. Wilderness character includes the qualities of untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, and other features of value (ecological, geological, scientific, scenic, or historic value unique to each specific wilderness area).”
2. The Forest did not include a desired condition to manage trails in designated wilderness to not exceed a designed use of trail class 3. Trail class 4 is allowed in wilderness for pack and stock designed use. The trail class is the prescribed scale of development for a trail, representing its intended design and management standards. Trail classes are general categories reflecting trail development scale, arranged along a continuum. Trail class 4 is considered highly developed and may be used in wilderness.
3. The forest plan states (MA1a-DC-06): “Existing outfitter and guide service opportunities are maintained in the Bob Marshall Wilderness Complex and the Mission Mountains Wilderness as determined by identified public need.”
4. Facilities are allowed in designated wilderness for the protection of the wilderness resource.
5. Prescribed fire in wilderness is permitted by policy in Forest Service Manual 2324. The Forest Service Manual describes the situations in which, in designated wilderness, prescribed burning can occur. The Forest has recently successfully implemented prescribed fire in the Mission Mountains Wilderness.

6. The forest plan (MA1a-STD-01) states: “Group sizes in excess of 15 people and 35 head of livestock per party within the Bob Marshall and Great Bear Wilderness Areas shall not be authorized.”

These are the existing limits on group and stock numbers; the Forest feels there is no need to change the stock limits in the Bob Marshall Wilderness Complex.

7. Existing permanent structures for the protection of the wilderness resource are currently allowed in the Bob Marshall Wilderness Complex. Any new structures would need to go through a minimum requirements analysis and site-specific environmental analysis. A minimum requirements analysis is beyond the scope of the forest plan.

8. The forest plan does not include the limits of acceptable change standards. Limits of acceptable change will be monitored as part of the monitoring plan (IND-WILD-02).

Management Area 1b—Wilderness and Recommended Wilderness

Comment (letter numbers 46, 58, 59, 108, 188, 217, 330, 2606, 2801, 2816, 2876, 2879, 2882, 2984, 3015, 3097)

The Forest should add the following areas as recommended wilderness: lands north of Jewel Basin because of wildlife habitat; lands east of Jewel Basin because of wildlife habitat; lands south of Jewel Basin, in the headwaters of Quintonkon Creek from Tom Tom Mountain south to Sixmile Mountain because of bull trout and wildlife habitat, and the road in upper Quintonkon Creek should be decommissioned from the junction with Posey Creek to the end; lands in the upper Sullivan-Slide Creek area; Bunker Creek, with the road in lower Bunker Creek decommissioned from the junction with spur road to Gorge Creek (present location of gate) up to the forks of Bunker Creek and Middle Fork Creek (approximately 5.8 miles); the Swan Crest; the lower Middle Fork (downstream of the Bear Creek/Middle Fork junction) should be managed as described in alternative B, but Paola Ridge and Dickey Creek, along with all other management area 5a lands in the area, should be classified as recommended wilderness; the west flank of the Flathead Range as these areas are steep, currently nonmotorized, provide real challenge to the wilderness user, provide great wildlife security, and help simplify management designations along the flank of the Flathead Range; Jewel Basin area with the addition of Tom Tom to Wikiup mountain; Cedar Creek Area of the Mission Mountains; Elk Creek area; Hemlock Creek area (sections 19, 29, and 32); Sunset Ridge area; Greater Jewel Basin area (west face of Jewel); Skyland area; the Lower Middle Fork (downstream of Bear Creek’s junction with the Middle Fork; and the roadless area north of Frozen Lake Road (NFS Road 114A).

The Forest should not include any recommended wilderness in the forest plan.

The Forest should make Sullivan Creek an eligible wild and scenic river because of bull trout and high redd counts and westslope cutthroat trout.

The Forest should make sure that Trail # 13 (the Cleft Rock Trail) is within the management area 1b boundary so that it agrees with the Whitefish Range Partnership agreement.

The Forest should not allow mechanized transport and motorized use in recommended wilderness.

Response

The preferred alternative B modified includes 190,403 acres of recommended wilderness comprised of these areas: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale.

The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas included in alternative B modified are an appropriate vision for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

Sullivan Creek was ranked a 2 for fish, which did not make it an eligible wild and scenic river.

Under alternative B modified, of the 10.22 miles of trail #13 (the Cleft Rock Trail), all but an estimated 2.44 miles are within the Tuchuck-Whale recommended wilderness area boundary. Under alternative C, all but an estimated 0.29 mile are within the Tuchuck-Whale recommended wilderness area boundary.

The forest plan has the following plan component (MA1b-SUIT-06) for management area 1b (recommended wilderness): “Mechanized transport and motorized use are not suitable in recommended wilderness areas.” The decisionmaker carefully considered the desired conditions for recommended wilderness and how suitability would help the Forest achieve the desired conditions for recommended wilderness. These areas have been identified and selected to be managed as recommended wilderness; therefore, the Forest should manage to protect the wilderness characteristics of these areas in the long term. The areas being recommended for wilderness do not currently have significant mechanized transport use, and currently no motorized travel is allowed in the recommended wilderness areas.

Management Area 2—General

Comment (letter number 217)

The Forest should adopt the current management area 18 into the forest plan and implement it until the comprehensive river management plan is revised and the forest plan is amended as necessary.

The Forest should base commercial outfitted river use on a needs assessment and allocation determination.

Response

The plan components in the forest plan protect the designated wild and scenic rivers. Management direction for the Flathead River is based on existing river recreation direction for the designated Flathead wild and scenic rivers until a comprehensive river management plan is completed for the three forks of the Flathead River. Alternative B modified includes a management strategy for a comprehensive river management plan to be completed within five years of the final record of decision for the forest plan.

River outfitter and guide use is based on the direction in the Flathead Wild and Scenic River Recreation Management Direction (USDA, 1986), which does base allocation on the desired conditions as set forth in this document.

Management Area 2a—Wild and Scenic Rivers

Comment (letter numbers 217, 2574, 2879, 3097, 3098)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should further describe the direction for management area 2a where such use is determined to not substantially interfere with protecting outstandingly remarkable values.
2. The Forest should not deem eligible the Lower Swan River, Elk Creek, or Logan Creek because these segments do not meet the outstandingly remarkable value thresholds, given the historical uses of the rivers themselves and the current level of development and surrounding land use.
3. The Forest should not manage eligible wild and scenic rivers as if they were already designated prior to their designation by Congress.
4. The Forest should not allow timber harvesting as a tool in eligible scenic and recreational wild and scenic river corridors.
5. The Forest should not have designated wild and scenic rivers outside of wilderness that are suitable for mechanized equipment because wild rivers may have more wild characteristics than wilderness, and the same restrictions that apply in wilderness should apply to wild rivers, both designated and eligible.
6. The Forest should close the Spotted Bear River Road from Beaver Creek Campground to the end of the road because it is management area 1b recommended wilderness on either side and there is no reason to keep this three-mile road open when a trail accesses the same point; make it recommended wilderness.
7. The Forest should make the Spotted Bear River a wild designation from the headwaters to Beaver Creek Campground because it has no road access except for one point; from Beaver Creek Campground to the South Fork of the Flathead River it should have a scenic designation because there is very little access and few dispersed sites.
8. The Forest should include a new desired condition to regularly update comprehensive river management plans every 15 years and a new objective that states that streams designated by Congress as wild and scenic rivers will have a comprehensive river management plan completed for that stream within five years of designation.

Response

1. A site-specific analysis would be completed for any type of proposed activity in a designated wild and scenic corridor to determine whether the action would protect and maintain the river's outstandingly remarkable values.
2. Alternative B modified does include the Lower Swan River, Elk Creek, and Logan Creek as eligible rivers because the eligibility study process determined that these rivers had outstandingly remarkable values. The Forest followed the directives in the proposed Forest Service Handbook 1909.12, chapter 80, sections 82.12 and 82.14. To be identified as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant when compared with similar values from other rivers at a regional or national scale. Unique, rare, or exemplary

features are those that are conspicuous examples of these values, which means they are among the best representatives of these features, within a region or the nation. Appendix 5 of the final EIS explains in detail how the wild and scenic river eligibility study process was done.

3. Management direction of eligible rivers is aligned with Forest Service Handbook 1909.12 chapter 80, section 84.2—Management Direction for Forest Service-Identified Study Rivers.
4. As long as the outstandingly remarkable values are protected, timber harvesting as a tool is allowed in potentially classified eligible scenic and recreational wild and scenic river corridors.
5. Wilderness character, outside of designated wilderness, does not apply to potentially classified wild eligible rivers. If the potential classification segment is outside of designated/recommended wilderness, mechanized transport may be suitable.
6. Closing the Spotted Bear Road from Beaver Creek Campground to the end of the road would be a site-specific decision, and the forest plan is not making site-specific decisions.
7. In the forest plan, the Spotted Bear River's potential classification is recreation.
8. Forest plans do not compel additional action. Therefore, a plan component requiring the revision of comprehensive river management plans every 15 years is not appropriate.

Management Area 2b—Wild and Scenic Rivers

Comment (letter numbers 3097, 3098)

The Forest should add the following suitability component to the forest plan in management area 2b: Eligible stream reaches are not suitable for federally licensed hydropower projects.

Response

Forest Service Handbook 1909.12, chapter 80, section 83.1, states: "If a proposed project has the potential to adversely affect the free-flow or outstandingly remarkable values of any river that has previously been determined to be eligible, the Responsible Official should study the suitability of that river for inclusion in the National System before approving the project. If the river is found suitable, then the proposed project must maintain free-flow and protect the outstandingly remarkable values."

In addition, section 84.3 (interim protection measures for eligible or suitable rivers) states: "For Hydroelectric Power Facilities, Forest Service-identified eligible rivers are to be protected pending a suitability determination. Forest Service-identified suitable rivers are to be protected for their free-flowing condition, water quality, and outstandingly remarkable values pending a designation by Congress. Rivers found eligible or suitable for the National System through federal agency planning processes are not protected by the Act from proposed hydroelectric facilities or other federally assisted water resources projects that have the potential to affect the river's free-flowing characteristics and other identified values."

A project or activity approval document must describe how the project or activity is consistent with applicable plan components by meeting the following criteria: For desired conditions, the project or activity contributes to the maintenance or attainment of one or more desired conditions or does not foreclose the opportunity to maintain or achieve any desired conditions over the long term. The Forest has two desired conditions for eligible rivers that relate to a site-specific analysis for a proposed hydropower project:

1. The free-flowing character of eligible wild and scenic rivers is maintained. (MA2b-DC-01)
2. Outstandingly remarkable values of eligible wild and scenic rivers are protected. (MA2b-DC-02)

Management Area 5—Backcountry

Comment (letter numbers 46, 58, 59, 108, 310, 2807, 2819, 2879, 3097)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should recommend a backcountry nonmotorized area (management area 5a) along the Swan Crest encompassing the headwaters of Conner Creek, Branch Creek, and Ball Creek because of critical habitat for bull trout, populations of westslope cutthroat trout considered genetically pure, maternal habitat for wolverine, core security area for grizzly bears, and diverse habitats and because it would bridge the areas recommended for wilderness to the north (upper Quintonkon/Jewel Basin) and those to the south (Sullivan Creek and Bunker Creek) along the Swan Crest.
2. The Forest should manage all inventoried roadless areas as management area 5a or 5c in accordance with the Whitefish Range Partnership Agreement.
3. The Forest should honor the Whitefish Range Partnership Agreement vegetation management agreement that was based on the Flathead National Forest's 2006 modified management area allocations and should manage management area 5a as mapped under alternative C.
4. The Forest should map the Whitefish Divide (north and south of Red Meadow) as management area 5a.
5. The Forest should map the Kah Mountain area as recommended wilderness, although management area 5a would be acceptable.
6. The Forest should map West Swan Face-Holland Lake to Napa as management area 5a, as in alternatives B and C. The Forest should map the western slope of the Swan Range as backcountry nonmotorized (management area 5a) or recommended wilderness where no existing motorized use occurs now.
7. The Forest should map Trail #78 (the Wire Trail) to Bond Creek as management area 5a instead of 5d.
8. The Forest should map the Bunker Creek area as recommended wilderness as in alternative C, and NFS Road 549 should be decommissioned and converted to a trail.
9. The Forest should keep Alpine Trail #7 open to mountain bikes and include the following desired condition: Portions of the Alpine #7 trail, as well as trails accessing Alpine #7 (including Middle Fork Bunker Creek, Bunker Creek, Chipmunk Peak, and Bruce Creek) provide high-quality mountain bike opportunities not found elsewhere in the Flathead National Forest.
10. The Forest should maintain the removal of the upper Sullivan Creek area from the over-snow motorized vehicle winter recreation opportunity spectrum and proposed management area 5a. The

final plan should make it clear that recreation opportunity spectrum settings do not preclude travel decisions.

11. The Forest should not allow backcountry areas to be suitable for timber harvest.

12. The Forest should close Quintonkon Road at Rock Creek and above this point make it management area 5a like the surrounding area.

13. The Forest should make the higher-elevation Jungle and Cedar Creek Roads management area 5a.

14. The Forest should map the Whitcomb Creek area and Big Bill Creek as management area 5a.

Response

Variations in management area allocations occur among the different alternatives, addressing the issues and in response to public comment. Section 2.2 in the final EIS describes the development of alternatives, including a description of those alternatives that were not considered in detail. In making his decision, the responsible official will consider all comments and points of view, with the intent of providing for an assortment of multiple uses of the Flathead National Forest. The responses below identify the allocations in alternative B modified, the preferred alternative. Also see responses to comments under the section Alternatives and responses to the other comments in this section related to management area allocations.

1. Alternative B modified recommends many different management allocations that encompass the Swan Crest, from backcountry motorized year-round, backcountry over-snow, backcountry summer motorized, and eligible wild and scenic river to recommended wilderness. See the management area map for alternative B modified (figure 1-02).

2. Thirty-seven percent of inventoried roadless areas are in recommended wilderness in the forest plan. Fifty-four percent are in backcountry management areas 5a-5d, 3 percent in management areas 2a (designated wild and scenic river) and 2b (eligible wild and scenic river), 4 percent in management area 6a (general forest low-intensity vegetation management), and 2 percent in management area 4a (research natural area).

3. The responsible official considered all points of view, including those expressed in the Whitefish Range Partnership Agreement and the desire for multiple uses of the Forest, in making this decision. See also the comments and responses under Management Area 6—General Forest, which describes in more detail some of the management area allocation decisions related to the Whitefish Range Partnership Agreement.

4. The Whitefish Divide near Red Meadow to the north is primarily management area 5c (winter motorized). To the south of Red Meadow is management areas 5a and 5c, with 6a surrounding the Red Meadow Lake. See the management area map for alternative B modified (figure 1-02).

5. In the forest plan, the area near Kah Mountain is management area 5c (over-snow motorized vehicle opportunities).

6. In the forest plan, west Swan Face (Holland Lake to Napa) is mapped a variety of different management areas—from management area 1b and 5a to management areas 5c, 6a, and 6b. See the management area map for alternative B modified (figure 1-02).

7. In the forest plan, Wire Trail to Bond Creek Trail is mapped as management area 5d (backcountry motorized year-round).
8. In the forest plan, a portion of Bunker Creek is recommended as wilderness. See the map of recommended wilderness areas (figure B-26) and the management area map for alternative B modified (figure B-18).
9. Alternative B modified does not include a desired condition specific to Alpine Trail #7 (the Swan Crest Trail). Under the forest plan, this trail would remain open to mechanized transport (mountain bicycles).
10. The upper Sullivan Creek area is in the forest plan motorized over-snow vehicle suitability map as management area 5a (closed to motorized use year-round). However, a site-specific analysis is required to close that area to existing over-snow vehicle use. The final EIS does state that the recreation opportunity spectrum is the framework for settings and opportunities and is determined, in part, by the suitability by management area for motorized and nonmotorized vehicle use. Travel management decisions are separate, project-level decisions that determine the specific areas and routes for motorized recreation consistent with areas identified in the plan as suitable for motorized recreation use.
11. Alternative B modified has backcountry areas (management areas 5a to 5d) where timber harvest is allowable, but they are not suitable for timber *production*. Suitable for timber production means that the lands are capable of providing a regularly scheduled removal of timber products that is sustainable over time. Timber harvest is allowable in backcountry management areas for use as a tool to contribute to meeting desired conditions as long as it is consistent with other plan direction. See section 3.21 of the final EIS for a more detailed discussion.
12. Alternative B modified does not close Quintonkon Road at Rock Creek and allocate it as management area 5a above this point.
13. Alternative B modified does not allocate the higher elevations above Jungle and Cedar Creek Roads to management area 5a. This area is allocated to management area 5c (backcountry motorized over-snow vehicle use) to the ridge. Over the ridge, it is allocated to management area 5a (backcountry nonmotorized year-round). The lower portion of the Jungle Creek and Cedar Creek Roads are in management areas 6a (general forest low-intensity vegetation management) or 6b (general forest medium-intensity vegetation management). See the management area map (figure B-18) for specific area allocations.
14. The forest plan allocates the Whitcomb Creek area to management areas 5a and 6b (the roaded portion), and Big Bill Creek is mapped as primarily management area 5a, although it is difficult to know the exact boundaries of both areas. See the management area map for alternative B modified (figure B-18).

Management Area 6—General Forest

Comment (letter numbers 108, 217, 257, 2574, 2801, 2807, 2816, 3021, 3097)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The forest plan should scale back on the designation of management areas 6a, 6b, and 6c in some areas (i.e., change management area 6a to management area 5 in parts of the North Fork and

South Fork geographic areas, Salish Divide) to favor protection of wildlife habitat, preserve more wild areas, and have less active management.

2. The Forest should keep as many vegetation management options open as possible by designating as much area as possible within the suitable timber base as management area 6c.
3. The forest plan designation of management area 6b in the North Fork geographic area does not accurately reflect the limitations of forest management in this landscape of high wildlife habitat values. Management area 6b should be split in two different management areas to reflect a moderate-low and moderate management intensity, as was done in the 2006 modified proposed plan with management areas 4.1a and 4.1b. This would better protect wildlife habitat.
4. The Forest should add a standard prohibiting permanent road construction and bridges in management area 6a so that major waterways are protected.
5. The Forest should designate areas adjacent to several major streams in the North Fork geographic area as management area 6a rather than management area 6b to be consistent with the low-intensity general forest management area 3.3 that was mapped in the 2006 modified proposed forest plan.

Response

1. These opinions and positions were considered by the responsible official in the development of the preferred alternative. The designation of management areas takes many factors into consideration and strives to strike an appropriate approach between multiple resource values and uses of the national forest lands. The management area 6a allocation is allocated in some alternatives to areas where important wildlife corridors exist. The management area 6b designation on the Salish Divide recognizes the importance of this area for wildlife connectivity and is one of the primary reasons why this area is designated 6b instead of 6c in the preferred alternative. Additionally, forestwide and geographic area plan components recognize wildlife values and provide direction for grizzly bear core areas, lynx habitat, and other wildlife habitat conditions regardless of the management area designation. Some of the adjustments to alternative B that were included in the preferred alternative and that address these concerns include the change of management area 6a to management area 5a in Harrison/Lost Jack Creeks and the Spotted Bear Mountain area.
2. Both management area 6b and management area 6c are suitable for timber production; timber harvest is allowable in management area 6a, but it is not suitable for timber production (see section 3.21 of the final EIS for a more detailed discussion). The plan states that vegetation management activity, including timber harvest, can be expected to occur within any of the general forest management areas (management area 6a, 6b, or 6c), with the different designations intended to reflect the anticipated intensity of management for planning purposes. The actual intensity of management would be determined at the project level and would be based on site-specific conditions and project-level objectives. To ensure this is fully understood, narrative within the plan and in appendix C has been added to clarify this aspect of the general forest management area designations.
3. The distinction between management area 4.1a and management area 4.1b in the 2006 proposed plan was not felt to be necessary in this plan revision process. Grizzly bear and Canada lynx habitat would be managed according to forestwide standards, regardless of management area allocation. As part of the integrated planning process, the suite of plan components for wildlife

were considered by the decisionmaker with respect to allocation of management areas in alternative B modified. The underlying habitat locations have not been removed and will continue to be primary considerations for any potential vegetation management considerations in those areas, as they are presently. The Forest has mapped management area 6b in the North Fork geographic area as closely as possible to the prior management areas 4.1a and 4.1b combined.

4. There are many plan components associated with road construction, reconstruction, restrictions and protective measures, no matter where the road occurs on the Forest. In addition, all streams have riparian management zones that serve to protect values associated with riparian and aquatic components (see section 3.2 in the final EIS for details). It is more appropriate to leave decisions on road construction to the project level, where site-specific factors can be assessed.

5. In the original proposed action (March 2015), the Forest had allocated some areas immediately adjacent to streams to management area 6a, with the original thought of being consistent with the management area 3.3 designation in the previous forest planning effort (2006 modified draft forest plan), which had allocated some streamside “buffer” areas as 3.3. However, this approach was not applied consistently across the entire Forest, and this management area mapping approach was reevaluated after the proposed action was published. The Forest decided to be consistent with its prevailing approach to avoid allocation of streamside riparian management zones as a separate management area. Therefore, for the publication of the draft EIS and forest plan (May 2016), the Forest remapped these streamside management area 6a areas, usually placing them in the adjacent management area designations. The approach is to define minimum-width riparian management zones explicitly in the forest plan (FW-RMZ-STD-01), use this definition to conduct the effects analysis in the final EIS, and allow for their accurate identification and mapping at the site-specific, project level of analysis. Plan components would apply to the riparian management zones as mapped at the project level. Riparian management zones are not suitable for timber production. Widths of riparian management zones for some streams and for wetlands are at least as wide as they have been in the existing plan (under INFISH) and are even wider for some streams and for wetlands. Refer to the discussion of riparian areas in section 3.2 of the final EIS.

Management Area 7—Focused Recreation Areas

Comment (letter numbers 13, 15, 49, 58, 59, 73, 108, 126, 128, 162, 189, 257, 259, 270, 282, 284, 296, 297, 321, 327, 330, 2574, 2585, 2622, 2629, 2801, 2816, 2864, 2874, 2876, 2879, 2882, 2887, 3006, 3021, 3029, 3047, 3061, 3069, 3097, 3122)

The Forest should add or subtract areas in management area 7 on the Forest and change plan components for management area 7 areas.

The Forest should map all management area 7 areas as in alternative D for the preferred alternative with the exception of Big Mountain, which should be as in alternative B.

The Forest should add more plan components to help provide direction on how management area 7 areas will be managed so that the desired condition for each area can be met.

The Forest should separate management area 7 into a frontcountry and backcountry management area.

Krause Basin: The Forest should prohibit all-terrain vehicle use of the old, user-created trail network in Krause Basin, restrict all-terrain vehicles to the main Peters Ridge Road and Strawberry Lake Road, and allow this on-road use only during the times Krause Basin is open to

motor vehicles and not mark the all-terrain vehicle trails on the ground. The Forest should prohibit motorized use from all but the main Peters Ridge and Strawberry Lake Roads.

The Forest should not map Krause Basin as management area 7.

Blacktail Nordic Ski Area: The Forest should include an additional plan component for the Blacktail Nordic Ski Area to make the area around the Blacktail Mountain Nordic ski trails not suitable for over-snow vehicle use.

Crane Mountain: The Forest should not map Crane Mountain as management area 7 because of adverse impacts to wildlife and other forest users and that those impacts to wildlife should be disclosed in the final EIS. The forest should continue to expand mountain bike opportunities.

Big Mountain: The Forest should only have the Big Mountain area as a focused recreation area.

Crystal-Cedar and Werner-Nicola: The Forest should continue expanding mountain bike opportunities in the Crystal-Cedar and Werner-Nicola focused recreation areas.

The Forest should add to the Crystal-Cedar management area 7b description the need to study the potential for additional motorized trails in the area east and south of Crystal Creek.

Hungry Horse: The Forest should not have management area 7 area around the Hungry Horse Reservoir suitable for timber production.

Response

Alternative B modified, the preferred alternative, has 24 focused recreation areas (management area 7), for a total of 61,047 acres. This number of focused recreation areas is the same as the allocation in alternative D. Descriptions and plan components for the focused recreation areas were revised to better express the specifics of each of the focused recreation areas.

Alternative B modified does not have a frontcountry or backcountry management area. The recreation opportunity spectrum was used to denote areas within focused recreation areas, as this is the framework that describes recreation settings and opportunities.

The desired conditions for focused recreation areas are as follows (MA7-DC-01 through 03): Focused recreational opportunities are provided in specific areas in response to increasing demand. Local communities can readily access these areas for a variety of motorized and nonmotorized experiences. These areas provide opportunities for large groups that may have high levels of social interaction, as well as for competitive and non-competitive events. Although natural ecological processes and disturbances are present within this management area, vegetation management activities play a role in affecting the composition, structure, and pattern of vegetation across most of these focused recreation areas. These management activities maintain or trend the vegetation and wildlife habitat towards the desired conditions.

Krause Basin: Alternative B modified allocates the Krause Basin as a focused recreation area. Alternative B modified does not change motorized access from the existing situation. Desired conditions specific to Krause Basin specify that existing trails provide summer (July and August) wheeled motorized trail experience on designated and signed routes. This area provides for motorized winter recreation opportunities close to local communities; nonmotorized (hiking, mountain biking, and equestrian) trail opportunities are provided; the old forest conditions of the cedar/hemlock stand containing the interpretive nature trail are preserved and continue to provide the opportunity to educate the public about this forest type.

Blacktail Nordic Ski Area: Alternative B modified does not include a plan component that restricts motorized over-snow vehicle use in the Blacktail Nordic Ski Area. The desired winter recreation opportunity spectrum classes are roaded natural and semiprimitive motorized.

Crane Mountain: Alternative B modified does include Crane Mountain as a focused recreation area. Effects to wildlife in this specific area would be considered at the site-specific project level, consistent with NEPA and other requirements.

Crystal-Cedar and Werner-Nicola: Alternative B modified does include Crystal-Cedar and Werner-Nicola as focused recreation management areas.

Hungry Horse: In alternative B modified, the focused recreation management area around the Hungry Horse Reservoir is suitable for timber production except within the developed recreation sites (see GA-HH-MA7-SUIT-01). Timber production would be consistent with the desired conditions for this focused recreation area.

Management Areas—General

Comment (letter numbers 46, 2574, 3011, 3015)

The Forest should allocate lands to the general forest management area:

- This would leave more management options on the table. The high-hazard areas need to be treated with multiple tools such as logging, thinning, weed control, and fuels reduction. Managing the forest would provide jobs for locals.
- This could allow some logging (making some jobs for locals), instead of just burning everything, thus reducing smoke problems and fear of fire escaping.
- The Forest should look at comments on mapping boundaries that were submitted electronically via the online mapping tool at the time of the proposed action.
- The Forest should adopt the management areas for the North Fork geographic area from the modified proposed action for recommended wilderness (1b), eligible wild and scenic rivers (2b), and backcountry nonmotorized (5a).

Response

The final EIS considers a range of alternatives in detail. Alternatives represent a range of possible management options from which to evaluate the comparative merits. Each alternative emphasizes specific land and resource uses and de-emphasizes other uses in response to the significant issues. This is primarily done by changing management area allocations, resulting in comparisons of the merits amongst the alternatives, such as including more backcountry and recommended wilderness areas (alternative C) versus including more lands that are suitable for higher levels of timber production (alternative D). All alternatives recognize that vegetation management, including timber harvest, is consistent with the multiple-use requirements of the Forest Service and is an important tool to help achieve forest plan desired conditions, including ecological (i.e., wildlife habitat, forest resilience) and social and economic (i.e., providing wood products and employment). An important consideration in the development of alternative B modified was that the areas selected as management area 6c were usually within the wildland-urban interface, thus allowing for a high level of flexibility for treatment of fuels in and adjacent to communities and structures. The responsible official considered all points of view and the desire for an appropriate mix of multiple uses for the Forest in identifying alternative B modified as the preferred alternative.

The Forest agrees with the commenter that the North Fork geographic area has high conservation value. The Forest followed most but not all of the recommendations for management areas made by the Whitefish Range Partnership for the North Fork geographic area in the design of the proposed action and of alternative B in the draft EIS. Some changes were made to refine boundaries to be consistent with site conditions or to correct mapping errors or inconsistencies (see the comments and responses under Management Area 6—General Forest). Alternative B modified in the final EIS also incorporates some minor changes based on mapping inconsistencies or errors, as well as changes made in response to comments and to portray the preferred alternative as identified by the responsible official.

The Forest did consider the comments made using the online mapping tool but did not always allocate management areas as recommended by the comments, for reasons explained in responses under specific management areas below.

Management Areas—Management Area Allocations, Motorized

Comment (letter number 2879)

The Forest should not allow motorized use along the Great Bear Wilderness near the Nyack area or along the Swan Front. The Swan Alpine Crest should continue to be nonmotorized from Trinkus Lake south. The Forest should look at the impacts of blanket motorized allocations on wildlife such as wolverines, mountain goats, and grizzly bears in the Swan Range. The Forest should take a closer look at existing uses and suitability based on what is actually occurring and appropriate and consider the astounding wildlife values in the Swan Range. The Forest should use a route and play area approach and utilize snow-depth and seasonal restrictions.

Response

Under alternative B modified, the motorized over-snow suitability along the Great Bear Wilderness near the Nyack area is what is existing under the 1986 forest plan, as amended. The changes made to the motorized over-snow vehicle suitability map in the forest plan are in response to the site-specific issues identified by the Whitefish Range Partnership agreement and public comments. The forest plan indicates where motorized over-snow vehicle use would be suitable but does not make site-specific decisions to close areas. The Forest did not elect to revise the amendment 24 decision in its entirety or to revise suitability for motorized over-snow vehicle use for the entire Swan Range because monitoring of use in these areas does not indicate a need for change at this time.

Forest Service Handbook 2320.3 states: Do not maintain buffer strips of undeveloped wildland to provide an informal extension of wilderness. Sections 3.7.4 and 3.7.5 of the final EIS analyzed the effects of motorized over-snow vehicle use on wildlife such as lynx, wolverines, and grizzly bears, as well as other resources. Alternative B modified does not include plan components that specify snow depth. The Swan Alpine Crest is open to motorized use to Trinkus Lake as well as to Crevice Lake, and the forest plan does not change suitability for these areas.

Maps

Comment (letter numbers 46, 242, 293, 2801, 2819, 2823)

The Forest should include additional areas for recommended wilderness that the Wildlife Conservation Society recommends.

The Forest should make sure the forest plan reflects the Whitefish Range Partnership Agreement's boundaries.

The Forest should include lands in the Bunker-Sullivan Creek area as recommended wilderness based on the map that Montana Wilderness Association and the Montana Headwaters Association submitted.

The Forest should include Elk Mountain, Morrison Creek east to Divide, as suitable for motorized over-snow vehicles and should close the Pool Creek access to the Lewis and Clark National Forest to snowmobiling.

The Forest should adopt "alternative E" in the Swan Valley, which removes any recommended wilderness and increases management areas 6a, 6b, and 6c.

Response

The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas recommended in this decision are an appropriate vision for the Flathead National Forest in consideration of the alternative analyses and public comments.

The forest plan includes 190,403 acres of recommended wilderness. The following areas were included in the selected alternative: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale.

The forest plan generally reflects the Whitefish Range Partnership Agreement, but not all aspects of the agreement were incorporated in the forest plan. The responsible official considered all points of view, including those expressed in the Whitefish Range Partnership Agreement and the desire for multiple uses of the Forest, in making this decision. The Forest appreciates all of the input and recommendations received throughout the planning process.

Thank you for your input. Figure B-03 identifies the motorized over-snow vehicle suitability map for alternative B modified and includes the Elk Mountain and Morrison Creek areas east to the divide between the Flathead and Lewis and Clark National Forests.

The Citizen reVision is an alternative considered but eliminated from detailed study. See section 2.4.6 in the final EIS, subsection "Citizen ReVision."

Mining, Minerals, and Energy

Mining, Minerals, and Energy—Forest Plan Components

Comment (letter numbers 108, 2816, 2855, 2904, 2994)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Desired condition 05 for minerals should be deleted since a leasing decision will not be part of the plan decision, making this desired condition inconsistent with the approved forest plan.
2. The desired condition for reclamation of abandoned mine sites where human health risks exist should be kept, but the Forest should also recommend consideration of reclamation of abandoned mine sites to remediate environmental contamination and degradation to fisheries and wildlife.

3. The forest plan should include additional guidelines for protection of water quality during the development of energy and mineral resources, including the following: location and design of mine facilities and mine water management; inspection, monitoring, and reporting requirements for mineral activities; and identification of active and abandoned mines on the Forest that pose risks to environmental degradation, with prioritization of sites for restoration.
4. More needs to be done to plan for potential energy development to minimize affects to grizzly bears and their habitat. A desired condition should be added: “Within the NCDE PCA [primary conservation area] and Zone 1 (including DCAs [demographic connectivity areas]), USFS will work with the Bureau of Land Management (BLM) to develop Master Leasing Plans (MLPs) with bear specific assessments prior to development taking place. These MLPs will include regulations around surface occupancy, operations, best management practices, mitigation, etc.”
5. Guideline FW-GDL-E&M-05 should be rewritten to require mineral operators to carry bear spray and to disallow firearms within energy and mineral claim areas and ingress and exit routes.
6. Standard FW-STD-E&M-04 should be rewritten to require garbage removal at least weekly instead of “in a timely manner.”
7. Minerals management under INFISH included standards or guidelines that address mineral operations or structures in riparian areas so as not to adversely affect inland native fish. The draft forest plan omits many of these requirements, including those related to inspection, monitoring, and reporting requirements; surface occupancy within riparian management zones; and location of support facilities.

Response

1. The Forest agrees with this comment. Because the plan revision does not include an oil and gas leasing analysis, this desired condition has been deleted from the forest plan.
2. This desired condition (FW-DC-E&M-02) has been changed to include reclamation of abandoned mines if they present a physical or chemical hazard, giving priority to those that pose a risk to human health.
3. Standard FW-STD-E&M-03 has been rewritten to apply forestwide, providing additional protection from mineral and energy development. In addition, current USFS mining and reclamation regulations already provide direction and guidance to minimize environmental impacts. The desired condition for reclaiming abandoned mines (FW-DC-E&M-02) has been rewritten to identify abandoned mines posing physical or chemical hazards on the Forest and give priority to reclamation of those with human health risks.
4. As stated in the introduction to the Energy and Minerals section of chapter 2 of the draft forest plan, the plan revision is not making any decisions on leasing activities. No leasing can occur until an EIS for an oil and gas leasing analysis is completed. There is no need to include this type of direction in the forest plan. The oil and gas leasing analysis will follow NEPA requirements, and coordination will occur with other agencies at that time.
5. The Forest Service cannot require the carrying of bear spray and cannot prevent the carrying of firearms.

6. The standard is correct as written. Timing of garbage removal depends on the remoteness of the location and the type of storage container.

7. Guideline FW-GDL-E&M-07 provides direction for the protection of riparian areas and inland native fish. Standard FW-STD-E&M-03 has been rewritten to apply forestwide, providing additional protection from mineral and energy development. In addition, current USFS mining and reclamation regulations provide direction and guidance to minimize environmental impacts.

Mining, Minerals, and Energy—General

Comment (letter numbers 324, 2994, 3291)

Although mining is not anticipated to be a major use of the Flathead National Forest, potential environmental effects exist, particularly with regard to risks of mobilization and transport of heavy metals and other pollutants to surface and ground waters. It is therefore important to include appropriate management direction to protect water quality and aquatic resources during mine exploration, development, operation, closure, reclamation, and post-closure. The desired conditions for locatable and leasable minerals should reference the need to protect other resource values and maintain desired conditions for other resources.

Some commenters requested no mining on the Forest or no permitting of mines and oil and gas exploration within the NCDE to provide protection for grizzly bears.

Response

The energy and mineral resource standards and guidelines (FW-STD-E&M and FW-GDL-E&M) in the forest plan provide many protection measures for other resources and do not need to be restated in the desired conditions.

Mining is an allowed use on national forests. Mining activities follow laws, regulations, and policy as well as forest plan direction that protects other resources. Plan direction provides protection of habitat for grizzly bears within the NCDE. Much of the NCDE has already been withdrawn from mineral entry (see sections 3.23 and 6.14 of the final EIS for more details). The selected alternative provides protection for grizzly bears consistent with law, regulation, and policy (see sections 3.7.5, subsection “Minerals” under “Grizzly Bear,” and section 6.5.5 of the final EIS for more details).

Mining, Minerals, and Energy—Oil and Gas Leases

Comment (letter numbers 2855, 2888, 2994, 3021)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Forestwide direction is silent on oil and gas leasing, only stating that no activity can take place until an EIS is completed. It would be valuable to include forestwide direction on how the Forest intends to deal with oil and gas leases.

2. An oil and gas leasing analysis is not part of the forest plan revision. When such an analysis commences, the Environmental Protection Agency will provide recommendations related to analysis and mitigation, including leasing stipulations, for oil and gas operations.

3. Some commenters requested that the national forests within the NCDE retire all current oil and gas leases and adopt NCDE-STD-MIN-08/FW-STD-E&M-08 from alternative 3/alternative C, requiring a no surface occupancy stipulation on any new leases in the primary conservation area and zone 1 (which includes the demographic connectivity areas).

Response

1. Although an oil and gas leasing analysis is not part of this forest plan revision, the forest plan does include some direction on future oil and gas leases. In the forest plan, energy and mineral resources standards FW-STD-E&M-01 through 08 and guidelines FW-GDL-E&M-01 through 03 and 05 include direction for oil and gas leasing. As stated in the draft EIS and draft forest plan, there will be no oil and gas leasing until a forestwide leasing EIS is completed. As with all EISs, the leasing analysis will include an opportunity for public review and comment.

2. Thank you.

3. The national forests in the NCDE will not be retiring any current oil and gas leases. Thank you for expressing your views on oil and gas leasing under alternative C. This alternative was considered in making the decision on the selected alternative and the forest plan. The selected alternative includes a stipulation for no surface occupancy on new leases in the primary conservation area.

Miscellaneous—Comments Incorporated by Reference

Comment (letter numbers 290, 298, 2601, 2762, 2765, 2821, 2829, 2904, 2937, 2984, 3021, 3024)

The Forest should consider the comments incorporated by reference that were submitted by the following groups:

- Swan View Coalition
- Montana Ecosystems Defense Council
- Friends of the Wild Swan
- Flathead-Lolo-Bitterroot Citizen Task Force
- Citizen reVision proposal submitted on behalf of Friends of the Wild Swan and the SwanView Coalition in 2014
- Ninemile Wildlife Workgroup
- F.H. Stoltze Land and Lumber Company
- Wildlife Conservation Society 9/12/16 letter, especially the section regarding the need for protected and connected landscapes
- Headwaters Montana, Inc. 9/20/16 letter, especially the comments regarding climate change impacts on grizzly bears and wilderness recommendations
- Pew Charitable Trusts 9/26/16 letter regarding management of recommended wilderness areas
- Greater Yellowstone Coalition 9/29/16 letter regarding the need for “providing habitat protections that ensure grizzly bear connectivity between populations”

- Swan View Coalition 9/29/16 letter regarding grizzly bear habitat security and connectivity

Response

The Forest Service appreciates the time and energy spent providing comments to the draft EIS. The comments have all been reviewed and responded to where appropriate. The consideration of the comments has greatly assisted in the development of alternative B modified. Refer to the responses to comments for the letters incorporated by reference (see table 3 for a list of responding organizations and their letter numbers).

Mitigation

Comment (letter numbers 2816, 2904)

The Forest should develop risk mitigation plans, which could include locating boom anchors along the Middle Fork of the Flathead River, avalanche sheds, stationing spill response trailers on Forest Service land, and access management during winter months. It is important that the Flathead National Forest and Burlington Northern Santa Fe Railroad plan not only to respond to an emergency but do as much as possible to prevent an emergency to begin with. This means building into the forest plan as many prevention measures as possible. The Forest should add GA-MF-DC-09: “Train derailment prevention plans developed cooperatively with BNSF Railroad will be implemented immediately to protect the Middle Fork Flathead River Corridor.”

Efforts to mitigate impacts are insufficient to satisfy the agency’s duty to minimize impacts of motorized over-snow vehicle designations. One of the desired conditions, FW-DC-REC-23, applies mitigation: “Trails are maintained to standard to reduce impacts to soil, water, and vegetation and meet health and safety requirements.” This desired condition does not fulfill the agency’s duty to minimize impacts of motorized over-snow vehicle designations on Forest resources, including soil, water, and vegetation. The Forest Service should first locate areas and routes to minimize impacts and then identify management to further reduce, or mitigate, any remaining impacts.

Response

The Forest recognizes the importance of timely and appropriate disaster response along the Middle Fork of the Flathead River. The U.S. Department of Transportation is responsible for the development and implementation of railroad safety rules and standards. The Montana Department of Disaster and Emergency Services and other State and Federal agencies are actively engaged in emergency planning to ensure the rail safety program is proactively addressing risk in Montana. The current desired condition (GA-MF-DC-05), which states that emergency disaster response is implemented cooperatively with the Burlington Northern Santa Fe Railroad and other cooperators to protect the Middle Fork of the Flathead River corridor and associated resources, properly characterizes the role the Forest should play.

The forest plan sets desired conditions, goals, objectives, standards, guidelines, and suitability to frame and guide future forest management decisions. Both standards and guidelines help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, and to meet applicable legal requirements. Desired condition FW-DC-REC-23 was replaced by the desired condition that roads and trails are maintained in accordance with road and trail management objectives (FW-DC-IFS-07). Infrastructure guidelines (e.g., FW-GDL-IFS-03, 06, and 08), along with other plan direction, would mitigate undesirable effects from roads and trails.

The Forest carefully analyzed consequences of motorized over-snow vehicle use in the final EIS. How the Forest complies with executive orders 11644 and 11989, which address minimization criteria for off-road use of motor vehicles on Federal lands, is discussed in detail in the draft record of decision.

Monitoring

Monitoring—Aquatics

Comment (letter numbers 44, 290, 2765, 2869, 2904, 2994, 3085, 3097)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should monitor culverts on closed roads to reduce effects to bull trout and other species.
2. The Forest Service routinely fails to monitor the effectiveness of best management practices, and their implementation and effectiveness should be monitored.
3. How riparian corridors will be monitored under the forest plan is crucially important given the critical role of these areas in a shifting climate.
4. The draft forest plan does not have robust monitoring standards for monitoring fish populations.
5. Regarding the monitoring of impacts and evaluating of potential influences on downstream water quality, the final EIS should provide a summary of any available water quality monitoring data (e.g., total nitrogen, total phosphorus, total suspended solids, temperature).
6. The Forest should conduct pre- and post-disturbance monitoring of water quality before conducting ground-disturbing activities in proximity to waterbodies, which would enable identification of existing water quality concerns as well as any adverse impacts.
7. Monitoring should be done to capture life that is in fishless lakes in contrast with life that is now in fishless lakes that are stocked with fish.

Response

1. The Forest has developed a culvert monitoring plan that will monitor culverts on closed roads within bull trout watersheds on a five-year rotational panel. Crews will inventory and clean culverts. Culverts that are identified for replacement or removal will be addressed as funding becomes available.
2. During the 2014 Montana best management practices review, the Forest's best management practices applied on Federal lands (the review included National Forest System and Bureau of Land Management lands) were found to be over 96 percent effective at preventing impacts to water quality (Ziesak, 2015). A report entitled "Effectiveness of Best Management Practices that Have Application to Forest Roads: A Literature Synthesis" (Edwards et al., 2016) summarizes the effectiveness of best management practices as follows: "Based on the results of most of these studies, the case can be made that most BMPs [best management practices] result in some level of effectiveness in terms of reduced sediment generation or transport" (p. 136).

3. Plan component MON-WTR-03 is designed to monitor the number of management entries and road crossings inside riparian management zones. In addition, PIBO monitoring will continue to monitor water temperatures.
4. The Forest cooperates with MFWP to monitor bull trout populations through redd counts. This technique is the best technique available to monitor bull trout, but if a decline is detected it may not be due to a change in habitat conditions but may instead be a result of negative interactions with non-native species, such as lake trout in Swan Lake or Flathead Lake. Juvenile fish can be monitored through electrofishing, but this is expensive and time consuming, and thus the Forest's monitoring metrics center around habitat. Even with excellent habitat, the Forest may not have robust fish populations due to their migratory nature and negative interactions with non-native fish.
5. Water quality data can be found on the Montana Department of Environmental Quality website. In addition, MON-WTR-06 calls for the monitoring of phosphorus, nitrites, and nitrates at select locations to determine whether Forest activities are contributing nutrients to Flathead Lake.
6. Pre-and post-monitoring of a project would occur at the site-specific level and would be determined at that time based upon the location, magnitude, and scale of the project. It is not a requirement at the plan level to conduct pre- and post-monitoring for every project.
7. This concern is specific to the South Fork Flathead Westslope Cutthroat Trout Conservation Project. Monitoring by MFWP occurred pre-treatment and post-treatment and found that invertebrates and amphibians recolonized the treated lakes even after fish stocking occurred. Under the forest plan, similar monitoring would occur if these types of projects are carried out in the future.

Monitoring—General

Comment (letter numbers 73, 324, 2821, 2869, 2879, 3009)

The Forest does not have an adequate monitoring strategy and/or is not adequately considering monitoring in the development of the forest plan.

Response

The forest plan's monitoring program (chapter 5 of the forest plan) addresses the most critical components for informed management of the Forest's resources within the financial and technical capability of the agency. Every monitoring question links to one or more desired conditions, objectives, standards, or guidelines. However, not every plan component has a corresponding monitoring question.

From the forest plan, chapter 5:

Items included in this monitoring plan also use data collection protocols for terrestrial and aquatic ecosystems at appropriate temporal and spatial scales. For example, monitoring item MON-TE&V-01 would be used to assess the change in key ecosystem characteristics of forest and non-forest vegetation at the scale of the potential vegetation type as well as forestwide. Using adaptive management principals, recently remeasured FIA data informed the development of management direction in the forest plan and will assist the Forest in determining if adjustments to management direction are needed in the future. For example, FIA data was used to assess the trend in the amount of old-growth forest by determining the amount burned by wildfire since the last FIA

measurements were completed. In light of this monitoring information, the forest plan has added plan components that place more emphasis on management for key ecosystem characteristics of old-growth forest, such as live trees and snags in the 20-inch-d.b.h. class. Monitoring item MON-WL-10 would be used to assess the status of habitat for wildlife species associated with snags and live trees in the 20-inch-or-greater d.b.h. class. Monitoring item MON-WL-15 would be used to assess the status of the breeding season bird community on the Forest using Integrated Monitoring in Bird Conservation Regions data and reports on species associated with those characteristics.

The Forest used the best available scientific information in the development of the monitoring plan, giving consideration to expected budgets and agency protocols. For example, Forest Inventory and Analysis data is the most accurate, reliable, and relevant data source for monitoring terrestrial vegetation conditions because it follows nationwide, statistically based Forest Inventory and Analysis protocols. Similarly, PACFISH/INFISH biological opinion (PIBO) data is the most accurate, reliable, and relevant data for monitoring aquatic ecosystem conditions because it uses a probabilistic sampling design. The program was initiated to evaluate the effect of land management activities on aquatic and riparian communities at multiple scales and to determine whether management practices are effective in maintaining or improving the structure and function of riparian and aquatic conditions.

A monitoring guide would be developed to provide more detailed information on the monitoring questions, indicators, frequency and reliability, data sources and storage, and cost. For example, the Forest anticipates that Forest Inventory and Analysis data will be used to monitor vegetation conditions and that data will be updated about every 10 years. However, data sources and frequency of updates may change, so the specifics will be included in a monitoring guide. A monitoring report will be completed biennially, but it is important to note that not all monitoring questions are expected to be evaluated biennially.

Also see comments and responses under Monitoring—Grizzly Bear.

Monitoring—Grizzly Bear

Comment (letter numbers 324, 2940)

The Forest Service should monitor attractants, including the numbers, locations, and mitigation measures for beehives, calving and lambing areas, boneyards, livestock allotments, poultry and small animal operations, garbage and other attractants, and hunters afield; high-use nonmotorized trails and associated grizzly bear-human conflicts in the primary conservation area; and grizzly bear habitat conditions as they change over time due to climate change.

Response

Under the auspices of the Interagency Grizzly Bear Committee, members of the NCDE Subcommittee work together to coordinate grizzly bear recovery efforts and monitoring programs throughout the recovery area. NCDE subcommittee members include USFWS, MFWP, National Park Service, USDA Forest Service, USDA APHIS-Wildlife Services, U.S. Geological Survey, U.S. Bureau of Land Management, Blackfoot Tribe, and Confederated Salish and Kootenai Tribes. Currently, MFWP has the lead for population monitoring in the NCDE, including compiling and reporting data on grizzly bear-human conflicts and subsequent response actions. Under the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013, p. 102), the signatories agree that MFWP would continue to fulfill this role. Conflicts associated with human encounters on trails are included in these data.

The draft NCDE conservation strategy (USFWS, 2013) identified several habitat monitoring items to be tracked within the primary conservation area. The draft conservation strategy also identified the data to be collected and reported by each land management agency (pp. 78-79). These include monitoring the motorized access standards (open motorized access density, total motorized access density, and secure core), the number and capacity of developed recreation sites and administrative sites, the numbers of commercial livestock grazing permits and sheep animal unit months, and any required monitoring of leasable and locatable minerals activities. These monitoring items have been incorporated into the action alternatives for the forest plan for the Flathead National Forest as well as the amendments to the forest plans for the Helena, Kootenai, Lewis and Clark, and Lolo National Forests. Furthermore, the Flathead's revised forest plan has additional monitoring items to track the duration of projects; the 10-year running averages of open motorized route density, total motorized route density, and secure core for each project; and the density or miles of motorized roads/routes in zone 1 under the action alternatives. A monitoring item to track the number of grizzly bear-livestock conflicts that occur specifically on NFS lands would also be added under the action alternatives.

Several of the monitoring items suggested by commenters would be impractical or cost prohibitive to monitor (e.g., number and locations of hunters afield) or are not applicable to the management of NFS lands (e.g., boneyards and poultry operations).

MFWP monitors grizzly bear populations, including grizzly bear-human conflicts, reproduction, mortality, and population trend. The draft NCDE conservation strategy also proposes to monitor grizzly bear body condition to assess any changes in the overall assimilated diet of grizzly bears and to monitor the physiological condition of animals. This data has been and would continue to be collected by MFWP, and the results would be reported in a monitoring report. The data provides insight into possible changes in food availability over time. Because of the wide variation in the diets of NCDE grizzly bears, it is infeasible to maintain on-the-ground monitoring of availability and use of individual food sources. The draft NCDE conservation strategy (USFWS, 2013, pp. 78-79) instead proposed monitoring the ratio of stable isotopes to assess any changes in the overall assimilated diet and monitoring the physiological condition of animals through bioelectrical impedance values. MFWP will continue to collect these data from all captured bears, and the results will be reported in the monitoring report. The data will provide insight into possible changes in food availability as climate change continues.

Monitoring—Lynx

Comment (letter number 2904)

The Flathead National Forest should monitor how and to what extent forest management is contributing to the conservation of lynx, mapped lynx habitat, and designated lynx critical habitat, considering persistence and recovery (see 36 C.F.R. § 219.12(a)(5)(iv)).

Response

The forest plan includes monitoring items for vegetation, lynx habitat, and critical habitat (see monitoring questions in appendix A and MON-T&E-Lynx-01 through 04 in chapter 5 of the forest plan).

Monitoring—Non-Native Invasive Species

Comment (letter numbers 58, 3009)

The Forest should develop a strong monitoring program for weeds and weed control. Methods that should be considered include (1) using volunteers to conduct monitoring, (2) prioritizing monitoring in areas open to livestock grazing and grasslands, and (3) using frequency rather than cover of weeds as a measure.

Response

Priority areas where weed management, and thus subsequent monitoring, will be focused are noted in the plan (see FW-DC-NNIP-01 and FW-OBJ-NNIP-01). The Forest believes that the flexibility to determine exactly where and how to treat and monitor weeds is best left to the weed manager and to site-specific assessment, as guided by the Forest's weed management plan, which is based on the Flathead National Forest's weed control decision notice (USDA, 2001). Methods for monitoring weeds that include volunteer help are not precluded by the plan. The monitoring guide (which will be prepared after the adoption of the forest plan) will outline methods and processes that could be followed to monitor noxious weeds and will note that the method used to monitor weeds may differ depending on the site or species and should be determined site specifically.

Monitoring—Species of Conservation Concern

Comment (letter number 3009)

The monitoring plan should identify how monitoring of plant species of conservation concern will be done, with the type and intensity of monitoring based on the risk associated with threats and adverse impacts to the plant. The monitoring methods should include quantitative measurements.

Response

Chapter 5 of the forest plan displays the plan components that will be monitored (which includes plant species of conservation concern) and the monitoring questions and measurement indicators. More detailed information on the indicators and methods, the frequency of monitoring, the data sources, and other specifics associated with monitoring of plan components will be provided in the monitoring guide, which will be developed after the decision is made for the forest plan. This is intended to allow the flexibility to be adaptive over time and to respond to new sources of data, methods, or other opportunities as they arise. The suggestions on monitoring factors to include for plant species of conservation concern will be reviewed and considered during development of the monitoring guide.

Monitoring—Wilderness and Recommended Wilderness

Comment (letter numbers 2869, 2879, 3097)

The Forest should add more elements in the monitoring plan that include requirements for recommended wilderness in regards to allowing existing mechanized transport and motorized uses; update the limits of acceptable change for the Bob Marshall Wilderness; and better quantify the monitoring of plan components. The Forest should monitor and manage the impacts of mechanized transport (bicycles) differently from motorized transport (motorcycles).

Response

The Forest included a new plan component (MA1b-SUIT-06) that states that mechanized transport and motorized use are not suitable in recommended wilderness areas. Therefore, a

specific monitoring item to track whether existing mechanized transport and or motorized equipment is exceeding baseline measures in recommended wilderness is not needed and is not included in the monitoring plan.

In designated wilderness, the Forest does continue to collect limits of acceptable change monitoring information. For the Bob Marshall Wilderness Complex, every five years a monitoring report is developed on the limits of acceptable change information collected and presented at the Bob Marshall Wilderness Complex public meeting. In addition to limits of acceptable change monitoring, the National Wilderness Stewardship Performance provides a framework for tracking how well the U.S. Forest Service is meeting the primary responsibility of preserving wilderness character under the Wilderness Act. With this framework, data is collected on the following seven categories: natural quality of wilderness character, undeveloped qualities of wilderness character, untrammeled qualities of wilderness character, solitude quality of wilderness character, other features of value quality of wilderness character, special provisions, and administration. Within these categories, the Forest may choose to report on various elements. Each element is worth 10 points; a wilderness scoring 60 points or higher indicates that the wilderness is meeting the baseline for preserving wilderness character. For the Bob Marshall Wilderness Complex, the following elements were chosen to report on: invasive species, natural role of fire, fish and wildlife, recreation sites, agency management actions, opportunities for solitude, cultural resources, workforce capacity, education, and wilderness character baseline. For the Mission Mountains Wilderness, the following elements were chosen: invasive species, natural role of fire, recreation sites, trails, agency management actions, opportunities for solitude, opportunities for primitive and unconfined recreation, workforce capacity, education, and wilderness character baseline.

Monitoring requirements for designated wilderness include the following monitoring question: Do management activities in designated wilderness areas protect, maintain, and preserve wilderness character? These are the potential indicators associated with this question:

- score on national wilderness stewardship performance elements
- limits of acceptable change monitoring measures for the Bob Marshall Wilderness Complex and Mission Mountains Wilderness
- the number and type of authorized motorized use and mechanized transport entries as reported through the USFS INFRA database
- the number and type of unauthorized motorized use and mechanized transport
- the number, kind, and extent of actions (natural and human-caused) that have occurred in designated wilderness areas on the Forest

Monitoring—Wildlife

Comment (letter numbers 2765, 2821, 2869)

1. The purpose of monitoring fish and wildlife for the *first* forest plan was to keep the public apprised of the population trends of key habitat indicator species over the life of the plan. The Forest should make these results available and indicate how their implications were considered and evaluated in the forest plan and EIS.

2. The Forest Service should add several focal species and ecosystems in addition to whitebark pine to monitor assumptions about coarse-filter habitat protection: bull trout, white-tailed

ptarmigan and/or mountain goat, two or three noxious weed species, American beaver, wolverine, riparian corridors, and the permeability of identified linkage zones/corridors for specific wildlife species over time.

Response

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Monitoring reports for the 1986 (first) forest plan are available on the Forest's website using the following link: <https://www.fs.usda.gov/main/flathead/landmanagement/planning>. The 1986 forest plan did not require monitoring of population trends for all indicator species. If information about population trend was available, it was considered in the Forest's assessment (made available to the public on the Flathead's website in April 2014) and also in the "affected environment" sections of the Forest's draft EIS (made available to the public in May 2016) and in the final EIS, sections 3.2, and 3.7.

2. Thank you for your suggestions. The responsible official has the discretion to set the scope, scale, and priorities for plan monitoring within the financial and technical capabilities of the administrative unit, but the monitoring program shall include one or more monitoring question(s) and associated indicator(s) for the eight items set out in the planning rule at 36 CFR 219.12(a)(5). Forest Service Handbook 1909.12 also addresses the development of the plan monitoring program, which must contain one or more monitoring questions and associated indicators addressing each of the following:

- The status of select watershed conditions.
- The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems.
- The status of focal species to assess the ecological conditions required under § 219.9.
- The status of a select set of the ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.
- The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.
- Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.
- Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.
- The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C); 36 CFR 219.12(a)).

The plan monitoring program outlined in chapter 5 of the forest plan, which includes some but not all of the monitoring items suggested in public comments, meets the requirements outlined above.

NEPA—General

Comment (letter numbers 2765, 3004)

The Forest is not consistent with the direction of the National Forest Management Act, NEPA, and the Multiple-Use Sustained-Yield Act (MUSYA) of 1960 or the 1982 USFS-USDA planning regulations.

The Forest is not clear when referencing Big Mountain and Whitefish Mountain Resort, which are not the same entities.

Response

The Forest Service is required to follow all existing laws, regulations, and policies relating to the management of national forest lands. Forest plan direction is designed to supplement existing direction and not repeat said direction. The forest plan is consistent with the National Forest Management Act, the Multiple-Use Sustained-Yield Act, NEPA, and other laws. The 2012 planning regulations replaced the 1982 planning regulations.

The Forest is aware of the difference between these two designations and makes the distinction in the description of the focused recreation area (management area 7) called Big Mountain, a larger area that encompasses the permit area of the Whitefish Mountain Resort (see the section on the Salish Mountains geographic area in chapter 4 of the forest plan).

Non-Native Invasive Species

Non-Native Invasive Species—General

Comment (letter numbers 233, 3009)

The Forest should add guidelines for minimizing weed spread and should also add additional weeds to the list of undesirable species. The Forest should clarify how it decides and proceeds to plant trees, reclaim roads, and prioritize weed treatments.

Response

The forest plan includes direction that addresses invasive plants, with desired conditions, objectives, standards, and guidelines in the Non-Native Invasive Plants section of the plan. This direction fully acknowledges the importance of protecting native plant species and communities from the potential impacts of invasive plants, especially in areas of high priority, such as native grasslands, wilderness, and riparian areas. Objectives for the treatment of invasive plants and priorities for treatment are provided. Guidelines that direct the reseeding of areas disturbed by management practices (such as timber harvest) are provided. All-inclusive lists of invasive plant species are not provided in the plan because they are continually updated. Specific species targeted for treatment would be determined at the project level of analysis and would be guided by the Flathead National Forest's integrated pest management strategy, established in 2001 under the Flathead National Forest's weed control decision notice (USDA, 2001).

In answer to the specific questions regarding how the Forest Service decides what trees to replant and how roads are reclaimed, the Forest Service is required by law (the National Forest Management Act of 1976) to restock a site with trees after regeneration harvesting (see the Timber section of the plan, FW-STD-TIMB-02), which may occur either through natural regeneration or by planting. The species and density is determined based on the site-specific

conditions and resource objectives. Generally, because western white pine is a native tree important to ecosystem diversity and a desired species, there are desired conditions designed to maintain or restore its presence across the landscape (see Terrestrial Ecosystems and Vegetation desired conditions in the forest plan). The Forest generally plants the species on suitable sites, when funds and seedlings are available. The specific roads that may be chosen for reclamation and the methods that may be used are also determined at the project level because terrain, road conditions, resource objectives, and other factors can vary depending upon the site.

Non-Native Invasive Species—Management and Treatment

Comment (letter numbers 131, 191, 233, 324, 2574, 2801, 2816, 2995, 2996, 3009, 3013, 3116, 3271)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

The Forest should manage weeds more aggressively and provide stronger, more comprehensive direction in the forest plan for weed management and control. Specific concerns and recommendations mentioned are as follows:

1. Montana law says landowners must control weeds. The Forest Service is not following this law.
2. Include standards or guidelines to control weeds during logging and road and trail construction and along closed roads and areas disturbed when decommissioning roads.
3. Prohibit boom sprayers unless followed by restoration plantings.
4. Only allow spot spraying of weeds in special botanical areas.
5. The Forest should include suggested additions to priority areas for weed treatments.
6. Map weeds along riparian areas.
7. Provide guidelines that direct the Forest Service to create a plan for prioritization of treatment areas and to identify priority areas.

Response

The responsible official believes that the plan components in the forest plan provide the necessary direction for invasive plant species at the programmatic level. The specific methods and means to achieve desired conditions are determined at the site-specific level. The Forest is operating under an adaptive and integrated pest management (IPM) strategy, established in 2001 under the Flathead National Forest's weed control decision notice (USDA, 2001), which provides direction and guidance to determine where, when, and how to treat weed species or sites. The integrated pest management strategy describes weed treatment prioritization and control methods and also provides monitoring guidance. In addition, other Forest Service-wide regulation and policy provides direction for weed management and control, which, according to planning rule directions, should not be repeated in forest plans. See the non-native invasive species section in the forest plan and section 3.6 in the final EIS for further information.

In response to the specific comments within this group:

1. The Flathead National Forest complies with state law and has an active weed management program, conducting weed control operations every year (in 2016, a total of 3,062 acres were treated across the Forest). Weed control is guided by the integrated pest management strategy described above. Because of its large land base, the Forest must prioritize areas for weed treatment, focusing on species and areas most at risk of ecological harm. Budget, access, and other factors limit the amount of area that can be treated. The Forest works with State coordinators and also has a number of partnerships with private groups to aid in the control of weeds on the Forest.
- 2, 3, 4. The forest plan includes guideline FW-GDL-NNIP-01 that focuses on timely reseeding of disturbed soils from management activities, an important response to management activities that contributes to achieving desired conditions related to non-native invasive plants.
5. The Forest added the priority areas suggested in this comment to the forestwide desired condition FW-DC-NNIP-01 and forestwide objective FW-OBJ-NNIP-01.
- 6, 7. Identification and mapping of weed infestations is part of the Forest's weed management program protocol. Prioritization of areas to survey occurs as part of the program strategy and is not an objective. Plan components should not direct processes such as mapping or planning. These type of actions are included in appendix C (potential management approaches and possible actions). The Forest has added some of the commenter's suggestions to this appendix.

Noise and Solitude

Comment (letter numbers 177, 246, 252, 264, 2856, 2879, 3035, 3063, 3139)

The Forest should preserve the Flathead National Forest as a quiet and peaceful place for the wildlife and for future generations of people to enjoy. Motorized uses are loud and pose safety issues on traditional-use trails (hiking, pack and saddle).

The Forest should enforce existing quiet, nonmotorized uses in all areas designated as wilderness or recommended for wilderness.

Response

There are about 2,220 miles of NFS trails on the Forest; about 1,107 miles of these trails are located outside of designated wilderness areas. Out of the 2,220 miles of trails, 226 miles (10 percent of the system) allow wheeled motorized use.

In winter, about 31 percent of the Forest is suitable for motorized over-snow vehicle use; 69 percent is not suitable for motorized over-snow vehicle use.

Reported conflicts between bicycle users and motorized users with hikers and/or pack and saddle are very low on the Forest. There are 226 miles of trails that allow wheeled motorized use and also use by hikers, pack and saddle, and mechanized transport (bicycle) and stock use (10 percent of the trail system). The Forest does not generally have any single-use trails, with the exception of the Jewel Basin Hiking Area.

The effects of motorized use (summer and winter) are discussed throughout section 3.10 of the final EIS. The forest plan has the following plan component (MA1b-SUIT-06) for management area 1b (recommended wilderness): "Mechanized transport and motorized use are not suitable in recommended wilderness areas." This helps determine whether future projects and activities are

consistent with desired conditions. The decisionmaker considered the desired conditions for recommended wilderness and how the suitability plan component would help the Forest achieve the desired conditions for recommended wilderness. Because these lands have been selected as recommended wilderness, the Forest should manage to protect the wilderness characteristics of these areas for the long term. The areas being recommended for wilderness do not currently have significant mechanized transport use in them now, although there is some motorized over-snow vehicle use allowed in one recommended wilderness area (Slippery Bill-Puzzle).

About 45 percent of the Forest is in designated wilderness and an additional 8 percent is in recommended wilderness, where motorized transport and uses do not occur.

Plants

Comment (letter numbers 217, 2574, 3009)

The forest plan direction provides good support for threatened and endangered plants. The Forest should remove FW-STD-PLANT-01 because it repeats the direction already provided for riparian management zones. Annual monitoring of howellia ponds should be required in order to adequately assess populations.

Response

Plan components in the threatened and endangered plant section of the plan were reworked for the forest plan to clarify and avoid redundancy with other plan components, focusing on leaving in the direction specifically needed for the threatened and endangered species. Refining of other plan components was also completed, to improve wording and clarity and appropriately designate each component as a desired condition, standard, or guideline. For example, as the commenter noted, the direction in the riparian management zone section provides for the needed protection to water howellia ponds and need not be repeated in the threatened and endangered plan section, so FW-STD-PLANT-01 in the draft forest plan was dropped in the forest plan. Also, it should be remembered that the Conservation Strategy for *Howellia aquatilis* (USDA, 1996) provides direction that will be adhered to in all cases to ensure the long-term persistence of water howellia. This includes conducting biological assessments or evaluations of all activities that may affect howellia habitat and following consultation procedures with the USFWS. It also addresses monitoring activities and needs.

Process—General

Comment (letter numbers 255, 2639, 3004, 3008)

The planning process the Forest followed in developing the forest plan and involving the public was inadequate.

Response

The opportunities for public participation were developed early on in the planning process due to the requirement under the 2012 planning rule that the forest plan revision be both collaborative and science-based. A number of community members participated in the collaborative effort, which is reflected in the forest plan. The Forest Service did not identify a preferred alternative at the time of the draft EIS because it simply did not have a clearly identified preferred alternative. Through careful consideration of the comments received, a preferred alternative (alternative B modified) has been identified that is within the range of alternatives analyzed in the draft EIS.

The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas recommended in alternative B modified are an appropriate vision for the Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

The Forest Service is required to follow all existing laws, regulations, and policies related to the management of national forest lands. The forest plan is consistent with the National Forest Management Act, NEPA, and other required policies and laws.

Public Involvement

Public Involvement—Collaborative Process

Comment (letter numbers 51, 2996, 3021, 3270)

The Flathead National Forest should not use a collaborative process to provide advantages to one user group over other users of national forest system lands.

Response

The Flathead National Forest places equal value on the input from all the entities that participated in the forest planning process. The value of collaborative groups' input into the planning process is their ability to be representative of a diverse set of interests in public land management and their ability to reflect these interests in a coordinated and integrated recommendation. Section 2.2.1 of the final EIS summarizes the public involvement efforts used in the development of the forest plan, which clearly demonstrates that the Forest provided robust, transparent, and open opportunities for anyone to participate in the planning process.

Public Involvement—Comment Period Extension

Comment (letter numbers 153, 2949, 3007, 3068, 3076, 3257)

The Forest should extend the comment period.

Response

The Forest reviewed the requests for an extension to the comment period with the responsible officials. The 120-day comment period (four months) was determined to be adequate time for reviewing the documents, and an extension was not granted.

Public Involvement—Coordinating with Local Governments

Comment (letter numbers 51, 62, 3079)

The Forest should coordinate with county governments and consider local county governments' growth policies when revising its plan.

Response

The Forest has facilitated an interagency working group consisting of county, State, tribal and Federal government representatives since the beginning of this plan revision process. This group has met quarterly since 2013, and a focus of these meetings was to discuss issues of mutual concern with respect to each agency's policies and/or plans. Section 1.6 of the draft EIS discusses

the process of involving the various government agencies as well as the consistency of the forest plan with the various agencies' policies and/or plans.

Public Involvement—Partnerships

Comment (letter numbers 2, 11, 20, 21, 29, 41, 53, 59, 65, 85, 108, 126, 143, 151, 152, 189, 213, 245, 321, 326, 330, 2574, 2578, 2579, 2585, 2614, 2640, 2642, 2766, 2773, 2775, 2777, 2778, 2781, 2784, 2855, 2865, 2873, 2877, 2879, 2881, 2887, 2896, 2899, 2923, 2925, 2948, 3003, 3004, 3006, 3013, 3029, 3032, 3041, 3048, 3057, 3060, 3061, 3064, 3065, 3084, 3116, 3120, 3211, 3126, 3139, 3147, 3157, 3266, 3268, 3280, 3292, 3298, 3300)

The Flathead National Forest should include the recommendations from the Whitefish Range Partnership in its forest plan.

The Flathead National Forest should continue to expand public and private partnerships in the development, construction, maintenance, and use of its trail system.

Response

The responsible official has selected alternative B modified as the preferred alternative, which incorporates many of the recommendations from the Whitefish Range Partnership. The Forest appreciates all of the input and recommendations received throughout the planning process. The Whitefish Range Partnership developed a set of comprehensive recommendation based upon equal consideration of all the various users and needs for the North Fork geographic area. Other commenters provided important considerations for the future management of the Flathead National Forest that did not reflect the multiple-use approach that guides the management of national forest system lands but provided valuable input to the planning process.

The Forest appreciates the recognition of the need for improved public/private partnerships in order to improve the management of the Forest's trail system. See also the comments and responses under Recreation—Trail Maintenance Partnerships.

Public Involvement—Public Meetings

Comment (letter numbers 153, 3010, 5053)

The Forest Service does not value public input and did not conduct themselves professionally in public meetings. The Forest service did not have a meeting place to adequately accommodate the attendees.

Response

The Flathead National Forest places equal value on the input from all the entities and individuals that participated in the forest planning process. The value of collaborative groups' input into the planning process is their ability to represent a diverse set of interests in public land management and their ability to reflect these interests in a coordinated and integrated recommendation.

The Forest staff strives to conduct themselves with utmost professionalism at all times and to hold meetings in appropriate facilities. The Flathead staff held numerous open houses and informational meetings with regards to the development of the forest plan as well as on specific issues of concern related to the planning process. Section 2.2.1 of the final EIS summarizes the public involvement efforts used in the development of the forest plan, which clearly demonstrates

that there were robust, transparent, and open opportunities for anyone to participate in the planning process.

Public Involvement—Public Outreach and Education

Comment (letter numbers 57, 2639, 3114, 3116, 3270)

The Forest should consider the perspective of the residents of the valley who actually live here, not that of a group of out-of-staters. The Forest should have more public outreach and education to discuss the impact the plan will have on the public for decades to come. The Forest should cultivate educational opportunities for all ages whenever possible and seek new, innovative ways to engage the public. The Forest should recognize that education and public awareness of the need for respect is imperative so that the public enjoys the lands and the impact is minimized.

The Forest should place lands under State land management, or another entity if available by contract, to allow the hiring of local loggers because most of the national forest lands in the valley are in a deplorable condition, lacking in management of the dead or dying, down and diseased trees.

Response

The Forest values the input of the local community. However, all comments received are given equal consideration because these lands are the public's lands.

Beginning with a news release July 19, 2013, as part of the public involvement process, the Forest staff led field trips and held a number of open-house sessions to discuss existing information and trends related to a variety of conditions found on the Forest. Public meetings held to date include:

Field trips

- Tally Lake District—August 2013
- Hungry Horse and Spotted Bear Districts—August 2013
- Swan Lake District—September 2013
- Glacier View District—September 2013

Collaboration on proposed action

- Stakeholder collaborative process workshop—September 2013
- Orientation meeting—December 2014
- Work group meetings—January through April 2014
- Meetings on forestwide desired conditions—February 2014
- Meetings on forestwide objectives—March 2014
- Meetings on geographic area desired conditions—April 2014
- Meetings on management area designations—May 2014
- Open house at the Swan Valley Community Hall—May 2014

Open houses on use of vegetation modeling in forest planning

- August 12 in Kalispell, August 13, 2014 at Condon Work Center in the Swan Valley
- Follow-up open house sessions on December 3 and 4, 2014

Draft proposed action

- Open houses—seven total, March and April 2015, in the following communities: Kalispell, Eureka, Seeley Lake, Missoula, Superior Lincoln, Choteau
- Draft forest plan, draft amendments, and draft environmental impact statement
- Open houses—two in June and four in September 2016 in Kalispell (twice), Missoula, and the Swan Valley

Another key component of the involvement and transparency of the public involvement efforts associated with this planning effort has been the information made available to the public through the use of the forest plan revision website. The Forest greatly benefitted from the use of collaborative mapping tools to receive input on its wilderness inventory and evaluation process. The ability to provide equal opportunity to anyone who wanted to participate in the planning process was greatly enhanced through the provision of web-based information that allowed the public to comment on the process as well as on plan components. The forest plan revision website is an excellent source of information that contains the most current information and also includes a record of all the previous public involvement efforts.

The Forest recognizes the importance of active forest management and the social and economic benefits provided by the Forest that local communities rely on. The forest plan proactively addresses the challenges and opportunities associated with increasing recreational demands, flat budgets, an active timber industry, and vegetation management, including fire and fuels management and terrestrial and aquatic habitat management.

The Forest is engaged in a number of education programs and will continue to develop opportunities as they arise. As stated in the forest plan (FW-DC-R&E-02), one of the Forest's desired conditions is: "Conservation education, interpretive, and visitor information programs provide opportunities for visitors, youth, and communities to appreciate and understand the Forest's natural and cultural resources and learn how to conserve those resources for future generations."

Recommended Wilderness

Recommended Wilderness—Allow Mechanized Transport and Motorized Use

Comment (letter numbers 1, 7, 80, 85, 99, 116, 126, 131, 156, 160, 188, 189, 192, 208, 216, 222, 231, 284, 291, 299, 300, 307, 310, 317, 321, 330, 2578, 2585, 2588, 2592, 2606, 2617, 2631, 2635, 2637, 2639, 2640, 2641, 2647, 2796, 2828, 2816, 2819, 2831, 2843, 2853, 2857, 2865, 2872, 2874, 2876, 2877, 2878, 2882, 2885, 2887, 2896, 2897, 2899, 2907, 2908, 2919, 2920, 2923, 2939, 2942, 2943, 3006, 3014, 3029, 3069, 3079, 3109, 3116, 3269, 3273, 3074, 3275, 3278, 3279, 3282, 3285, 3292)

The Forest should allow mechanized transport and motorized uses in recommended wilderness, either only at existing levels and in specific recommended wilderness areas or at any level and in any recommended wilderness.

Response

The responsible official considered all points of view and strived for an appropriate mix of multiple uses for the Forest when making his decision.

The forest plan has the following plan component (MA1b-SUIT-06) for management area 1b (recommended wilderness): “Mechanized transport and motorized use are not suitable in recommended wilderness areas.” The identification of suitability helps determine whether future projects and activities are consistent with desired conditions. The decisionmaker considered how this plan component would help the Forest achieve the desired conditions for each recommended wilderness area. Because these lands have been selected as recommended wilderness, the Forest should manage them to protect their wilderness characteristics in the long term. The areas being recommended for wilderness do not currently have significant mechanized transport use in them now, and there is some motorized over-snow vehicle use allowed in one recommended wilderness area (Slippery Bill-Puzzle).

The final EIS shows the effects of this plan component for both alternatives B modified and C. Because the forest plan does not authorize site-specific prohibitions or activities, a site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for this plan component to prohibit motorized use and mechanized transport in these areas.

Recommended Wilderness—At-Risk Species

Comment (letter numbers 2819, 2855, 2869)

The Forest should add the Alcove/Bunker area as recommended wilderness as both Bunker Creek and Sullivan Creeks support genetically pure strains of westslope cutthroat trout and bull trout that are nationally important both to maintain the westslope cutthroat trout and to recover the bull trout from its current status as a threatened species.

The Forest should recommend wilderness protection for areas that are known to be important for climate change adaptation and wildlife connectivity.

The Forest should recommend additional wilderness areas to create refugia for wolverine and Canada lynx in the face of a changing climate as this designation will protect essential core habitat and maternal habitat for both species.

The Forest should recommend wilderness areas that were considered to be critically important areas within the wilderness inventory that have the potential to sustain and improve the resilience of many at-risk species.

The Forest should recommend more of the Bob North Wilderness Inventory Area (88,034 acres) as recommended wilderness because of the ecological importance of these lands to multiple wildlife species—particularly in light of the vital regional connectivity provided along both east-west and north-south gradients.

The Forest should recommend the entirety of the Swan Face as wilderness as this area is critically important maternal habitat and primary habitat for wolverine.

The Forest should recommend the Bunker Creek and Spotted Bear Creek area as wilderness as both these creeks include critical habitat for bull trout, while Bunker and String Creeks, Addition, Bruce and Tin Creeks, Bear, Big Bill and Whitcomb Creeks, as well as the South Fork of the Flathead and Spotted Bear Rivers, are home to genetically pure populations of west slope cutthroat trout.

The Forest should recommend the South Fork of the Flathead River Basin as wilderness as this area is recognized as a vitally important stronghold for populations of westslope cutthroat and bull trout.

The Forest should recommend the Upper Bunker Creek and String Creek areas for wilderness as they contain summer habitat for mountain goat interspersed with winter habitat, with additional habitat for this species available in Addition and Little Creeks.

Response

Alternative B modified includes 190,403 acres of recommended wilderness. The following areas were included in the selected alternative: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale.

The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public and resource needs. The areas recommended in this decision were based upon an appropriate allocation for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

Regardless of management area allocation, there are plan components designed to maintain or restore the ecological conditions necessary for persistence of species such as westslope cutthroat trout, bull trout, Canada lynx, wolverine, and mountain goat.

Recommended Wilderness—Decrease Areas

Comment (letter numbers 1, 7, 8, 9, 31, 51, 56, 193, 197, 203, 208, 211, 225, 287, 292, 330, 331, 2573, 2580, 2648, 2781, 2793, 2799, 2805, 2840, 2847, 2879, 2851, 2858, 2870, 2873, 2880, 2903, 2938, 2939, 2949, 2999, 3007, 3011, 3054, 3067, 3068, 3074, 3077, 3078, 3080, 3092, 3099, 3115, 3116, 3130, 3259, 3267, 3269, 3282)

There is already enough or too much wilderness on the Forest. Specific areas, such as the Jewel Basin Recommended Wilderness Area, do not have wilderness characteristics. Recommended wilderness does not allow for active management of the Forest and thus does not provide for multiple use. The Forest cannot manage the existing wilderness on the Forest. Recommended wilderness should not be adjacent to or near private property because fire management or suppression cannot occur in wilderness, therefore jeopardizing private property.

Response

The responsible official has identified alternative B modified as the preferred alternative, and it includes 190,403 acres of recommended wilderness (management area 1b). The following recommended wilderness areas were included in alternative B modified: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale. All areas recommended for wilderness have wilderness characteristics, as described in appendix 4.

The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas included in alternative B modified are an appropriate vision for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

Recommended Wilderness—Draft EIS Analysis

Comment (letter numbers 23, 2631, 2639, 2869, 2879, 2901)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should redo its wilderness inventory because it is circumventing Congress and the 2012 planning rule by redefining the term ‘not substantially noticeable’ as any human activity (timber harvest) prior to 40 years from the time the forest planning process began. This circumvention of the rule cannot be allowed, and the original definition should stand; if the human activity can be seen, then it must be noticeable, therefore disqualifying the area for recommended wilderness.

2. The Forest should not have any recommended wilderness designation because it is too site-specific and prohibits any type of use other than hiking.

3. The Forest should add additional highly qualified areas for recommended wilderness that were in alternative C to the preferred alternative and clearly state why other recommended wilderness areas are not being recommended. If the reason for not recommending areas is because of the existing use, the final EIS wilderness analysis needs to provide data to support the agency’s rationale.

4. The agency needs to explain why the wilderness plan is incorporated into the forest plan rather than the forest plan revision process being used to amend or change the wilderness plan. The Forest should make clear what direction in the wilderness plan is changing with the forest plan.

5. The Forest should clarify the statement, “Some commenters wanted all lands within the wilderness inventory area as recommended wilderness but as this was a broad inventory, not all acres within this inventory had wilderness characteristics.” By definition, the areas identified in the inventory have wilderness characteristics or they would not have been included in the inventory.

6. The Forest should have at least one alternative that includes all the roadless land (distinct from the inventoried roadless areas) as recommended wilderness or another protected classification.

7. The Forest should not allow mechanized transport or motorized uses in recommended wilderness areas.

See also the comments and responses under Alternative C.

Response

1. The wilderness inventory areas were determined following the wilderness inventory process in Forest Service Handbook 1909.12 chapter 70 for identifying lands that may be suitable for inclusion in the National Wilderness Preservation System. Lands included in the wilderness inventory were carried forward for evaluation. The process paper on the identification and inventory of lands on the Flathead National Forest that may be suitable for inclusion in the National Wilderness Preservation System can be found in appendix 4 of the final EIS, as well as the wilderness evaluation, which includes information on past timber harvest in the wilderness inventory areas. The term ‘substantially noticeable’ is not defined in the 2012 planning rule or in the Forest Service Handbook 1909.12 chapter 70 for recommended wilderness. Therefore, the

Forest defined the term for timber harvest based on Forest-specific conditions. See appendix 4 to view the full definition and what it was based on.

2. The 2012 planning rule (36 CFR 219.7(c)(2)(V)) states that in developing a proposed plan revision, the Forest is required to identify and evaluate lands that may be suitable for inclusion in the National Wilderness Preservation System and determine whether to recommend any such lands for wilderness designation. Although it is not required that any wilderness be recommended, the decisionmaker did include recommending 190,403 acres in consideration of the wilderness evaluation, alternative analyses, and public comments.

3. The decisionmaker has carefully considered the allocation of management areas, including recommended wilderness areas, to determine the mix of land and resource uses that would best meet public needs. The areas recommended for wilderness in alternative B modified are an appropriate allocation for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

4. As stated in MA1a-DC-01 in the forest plan, designated wilderness areas are managed to preserve and protect the wilderness character as required by the Wilderness Act. It is outside the scope of a forest plan revision to update these wilderness plans through the revision process. Wilderness plans are used along with the forest plan, law, and other administrative direction in managing designated wilderness areas.

5. Forest Service Handbook 1909.12 chapter 70 states that the primary function of the wilderness inventory step is to efficiently, effectively, and transparently identify all lands in the plan area that may have wilderness characteristics as defined in the Wilderness Act. The primary function of the evaluation step is to evaluate, pursuant to criteria set forth in the Wilderness Act of 1964, the wilderness characteristics of the lands included in the inventory. All lands included in the inventory must be evaluated; not all of these lands were found to have wilderness characteristics.

6. One alternative considered but eliminated from detailed study was that all inventoried roadless areas should be recommended as wilderness (see page 31 of volume 1 of the draft EIS). There is no definition for or identification of “roadless land” on the Forest outside of those identified as inventoried roadless areas, so it is not possible to consider all “roadless land” for recommended wilderness.

7. The forest plan has the following plan component (MA1b-SUIT-06) for management area 1b (recommended wilderness): “Mechanized transport and motorized use are not suitable in recommended wilderness areas.” The identification of suitability helps determine whether future projects and activities are consistent with desired conditions. The decisionmaker considered the desired conditions for recommended wilderness and how this plan component would help the Forest achieve the desired conditions for recommended wilderness. These areas have been identified and selected to be managed as recommended wilderness in alternative B modified, and therefore the Forest will manage these areas recommended for wilderness designation to protect and maintain the ecological and social characteristics that provide the basis for their suitability for wilderness designation in the long term. The areas being recommended for wilderness do not currently have significant mechanized transport use in them now, and motorized over-snow vehicle use is allowed in one recommended wilderness area (Slippery Bill-Puzzle).

Recommended Wilderness—Inventoried Roadless Areas

Comment (letter numbers 14, 15, 46, 51, 100, 102, 109, 110, 128, 163, 214, 228, 246, 249, 266, 268, 270, 278, 296, 323, 2891, 2613, 2614, 2624, 2630, 2631, 2855, 2894, 2904, 2950, 2984, 2996, 3002, 3014, 3021, 3037, 3042, 3057, 3065, 3072, 3097, 3266, 3292, 3293)

The Forest should recommend all roadless and inventoried roadless areas as wilderness, as in alternative C.

The Forest should prohibit mechanized transport and motorized use within recommended wilderness.

The Forest should manage roadless areas for multiple-use management. The Forest should not recommend Tuchuck-Whale as recommended wilderness as the Whale Creek and Tuchuck area and the lands between these two areas has had substantial timber harvest in the past that is still noticeable. The 2012 planning rule states that to be included as recommended wilderness, this type of human activity has to be not substantially noticeable, and therefore those areas with noticeable timber harvest should be excluded from recommended wilderness.

Response

In alternative B modified, 37 percent of all inventoried roadless areas on the Forest are recommended for wilderness (management area 1b). About 30 percent of the recommended wilderness areas in alternative B modified were in the wilderness inventory areas. The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas recommended in this decision are an appropriate allocation for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

The forest plan has the following plan component (MA1b-SUIT-06) for management area 1b (recommended wilderness): “Mechanized transport and motorized use are not suitable in recommended wilderness areas.” The identification of suitability helps determine whether future projects and activities are consistent with desired conditions. The decisionmaker considered the desired conditions for recommended wilderness and how this plan component would help the Forest achieve the desired conditions for recommended wilderness. Because these areas have been identified and selected to be managed as recommended wilderness, the Forest should manage to protect the wilderness characteristics of these areas in the long term. The areas being recommended for wilderness do not currently have significant mechanized transport use in them now, and there is motorized over-snow vehicle use allowed in one recommended wilderness area (Slippery Bill-Puzzle). The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas recommended in this decision are an appropriate allocation for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

The Forest followed the 2013 Forest Service Handbook 1909.12, chapter 70, section 71, to determine lands within the wilderness inventory areas that may be suitable for inclusion in the National Wilderness Preservation System. Lands included in the wilderness inventory were carried forward for evaluation. The past timber harvest areas within the Tuchuck-Whale area were determined not to be substantially noticeable, and this is documented in the Final Identification and Inventory of Lands on the Flathead National Forest That May Be Suitable for Inclusion in the National Wilderness Preservation System (see appendix 4).

Recommended Wilderness—Inventoried Roadless Areas, Draft EIS

Comment (letter numbers 2639, 2904, 2940, 3010, 3021)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should change the definition of what constitutes a roadless area to one that hasn't had an open road in at least one year's time, but because an area may be considered roadless does not in any way mean it should be recognized as wilderness.
2. The Forest should address the need to maintain 65 percent of these eligible wilderness lands (roadless areas) in wilderness condition and how this would affect the plants, wildlife, and water that depend on wilderness-quality lands.
3. The Forest should analyze and disclose the impact of not protecting the conservation values of those non-inventoried roadless area lands that are identified in the wilderness inventory but that are not recommended for wilderness. Specifically, the draft EIS fails to analyze the impacts of (1) not protecting the wilderness character of these lands, which includes those values identified in the Chapter 70 wilderness evaluation process, and (2) not protecting the roadless character of these lands, which includes their ecological values.
4. The Forest should define 'wilderness inventory' in the glossary.
5. The Forest should rename the recommended wilderness areas to reflect the mountain ranges of these areas.

Response

1. The Forest cannot change the definition of a roadless area; this is defined in the Roadless Area Conservation Rule.
2. Section 3.16.3 of the final EIS discusses how inventoried roadless areas on the Forest would be managed under alternative B modified. The majority (54 percent) of inventoried roadless areas are within the backcountry management area designations (5a-5d), and 37 percent are in recommended wilderness (management area 1b). No inventoried roadless areas are suitable for timber production.
3. In appendix 4 of the final EIS, the section titled Summary of Management Direction for the Wilderness Inventory Areas by Alternatives discloses how the lands within the wilderness inventory that were not recommended for wilderness would be managed, through management area allocation, under alternative B modified. The final EIS includes an analysis of the effects of the management area designations, including the effects of management area designations on inventoried roadless areas. Backcountry management areas and/or recommended wilderness were the primary designations for inventoried roadless areas. The Forest Service Handbook contains wilderness evaluation directives (1909.12, chap. 70) that are clear that inclusion in the wilderness inventory is not a designation that conveys or requires a particular kind of management; therefore, not all lands within this inventory must be managed to protect wilderness characteristics. Only lands recommended for wilderness must maintain and protect wilderness characteristics. Inventoried roadless areas that are not recommended for wilderness must still be managed to protect their roadless character.
4. The definition of 'wilderness inventory' has been added to the glossary.

5. The Forest named the recommended wilderness areas based on various types of geographical features of the areas.

Recommended Wilderness—Limit Mechanized Transport and Motorized Uses

Comment (letter numbers 16, 21, 23, 54, 65, 90, 152, 162, 177, 186, 187, 223, 229, 234, 238, 241, 245, 252, 257, 266, 270, 282, 291, 296, 304, 312, 326, 2579, 2601, 2603, 2606, 2613, 2630, 2634, 2646, 2649, 2761, 2767, 2773, 2779, 2801, 2807, 2808, 2813, 2816, 2852, 2856, 2869, 2879, 2881, 2892, 2900, 2904, 2937, 2939, 2946, 12983, 2984, 2985, 2988, 2995, 2996, 3004, 3013, 3021, 3030, 3031, 3033, 3037, 3042, 3049, 3051, 3057, 3060, 3072, 3084, 3087, 3093, 3101, 3106, 3116, 3142, 3151, 3152, 3153, 3155, 3156, 3264, 3287, 3298)

The Forest should not allow mechanized transport or motorized use in recommended wilderness.

The Forest should choose the recommended wilderness in alternative C.

Response

The forest plan has the following plan component (MA1b-SUIT-06) for management area 1b (recommended wilderness): “Mechanized transport and motorized use are not suitable in recommended wilderness areas.” The identification of suitability helps determine whether future projects and activities are consistent with desired conditions. The decisionmaker considered the desired conditions for recommended wilderness and how this plan component would help the Forest achieve the desired conditions for recommended wilderness. These areas have been identified and selected to be managed as recommended wilderness, and because these lands have been selected as recommended wilderness, the Forest will manage to protect the wilderness characteristics of these areas in the long term. The areas being recommended for wilderness do not currently have significant mechanized transport use in them now, and there is motorized over-snow vehicle use allowed in one recommended wilderness area (Slippery Bill-Puzzle).

Under alternative B modified, the forest plan includes 190,403 acres of recommended wilderness. The following areas were included in the selected alternative: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale. See the draft record of decision for more discussion of recommended wilderness.

Recommended Wilderness—Manage as Designated Wilderness

Comment (letter numbers 11, 20, 21, 53, 65, 131, 143, 191, 213, 250, 253, 326, 900, 2766, 2775, 2777, 2781, 2925, 3004, 3031, 3034, 3048, 3057, 3065, 3120, 3128, 3136, 3147, 3157, 3265, 3266, 3268, 3280, 3284, 3287, 3289, 3292, 3295, 3297, 3300)

The Forest should manage recommended wilderness like designated wilderness and prohibit all uses that are not allowed in designated wilderness such as road building, bicycle use (mechanized transport), motorized use, and timber harvest.

Response

The forest plan has the following plan component (MA1b-SUIT-06) for management area 1b (recommended wilderness): “Mechanized transport and motorized use are not suitable in recommended wilderness areas.” The identification of suitability helps determine whether future projects and activities are consistent with desired conditions. The decisionmaker considered the desired conditions for recommended wilderness and how this plan component would help the

Forest achieve the desired conditions for recommended wilderness. Because these lands have been selected as recommended wilderness, the Forest will manage to protect the wilderness characteristics of these areas in the long term. The areas being recommended for wilderness do not currently have significant mechanized transport use in them now, and there is motorized over-snow vehicle use allowed in one recommended wilderness area (Slippery Bill-Puzzle).

Plan components related to suitability in recommended wilderness in the forest plan are as follows (MA1b-SUIT):

- 01 The Jewel Basin recommended wilderness area is not suitable for additional outfitting and guiding or large group events.
- 02 Recommended wilderness areas are not suitable for timber production; timber harvest is not allowed.
- 03 Recommended wilderness areas are suitable for restoration activities where the outcomes will protect the wilderness characteristics of the areas, as long as the ecological and social characteristics that provide the basis for wilderness recommendation are maintained and protected.
- 04 Recommended wilderness areas are suitable for restoration activities where the outcomes will protect the wilderness characteristics of the areas, as long as the ecological and social characteristics that provide the basis for wilderness recommendation are maintained and protected.
- 05 Recommended wilderness areas are not suitable for road construction or reconstruction.
- 06 Recommended wilderness areas are not suitable for removal of salable mineral material (includes sand, stone, gravel, cinders, clay, pumice, and pumicite).
- 07 Mechanized transport and motorized use are not suitable in recommended wilderness areas.

Recommended Wilderness—Mechanized Transport/Motorized Uses

Comment (letter numbers 2869, 2873, 2879, 2882)

The Forest should clarify in the final EIS the suitability of mechanized transport and motorized uses in recommended wilderness and their effects on recommended wilderness. The Forest should have stronger language in the plan regarding mechanized transport and motorized uses in recommended wilderness areas to show that they are not allowed and that management of these areas will be changed.

Response

The forest plan has the following plan component (MA1b-SUIT-06) for management area 1b (recommended wilderness): “Mechanized transport and motorized use are not suitable in recommended wilderness areas.” The identification of suitability helps determine whether future projects and activities are consistent with desired conditions. The decisionmaker considered the desired conditions for recommended wilderness and how the suitability plan component would help achieve the desired conditions for recommended wilderness.

These areas have been identified and selected to be managed as recommended wilderness in alternative B modified, and therefore the Forest will manage these areas recommended for

wilderness designation to protect and maintain the ecological and social characteristics that provide the basis for their suitability for wilderness designation.

The areas being recommended for wilderness do not currently have significant mechanized transport use in them, and there is motorized over-snow vehicle use allowed in one recommended wilderness area (Slippery Bill-Puzzle). The final EIS shows the effects of this plan component for both alternative B modified and alternative C. Because the forest plan does not authorize site-specific prohibitions or activities, a site-specific analysis in compliance with the National Environmental Policy Act would need to be conducted in order to prohibit motorized use and mechanized transport in these areas.

Recommended Wilderness—Site-Specific Suggestions

Comment (letter numbers 3, 4, 11, 16, 18, 19, 21, 28, 36, 40, 42, 47, 53, 54, 55, 59, 65, 142, 143, 152, 191, 195, 200, 201, 213, 233, 234, 238, 245, 247, 250, 252, 253, 264, 270, 296, 319, 325, 326, 900, 2579, 2610, 2613, 2630, 2632, 2634, 2640, 2649, 2652, 2653, 2766, 2768, 2769, 2770, 2773, 2775, 2776, 2777, 2781, 2783, 2784, 2800, 2801, 2807, 2816, 2819, 2824, 2830, 2852, 2865, 2869, 2879, 2881, 2899, 2924, 2925, 2937, 2937, 2939, 2950, 2987, 2989, 2995, 2998, 3003, 3013, 3021, 3028, 3031, 3032, 3033, 3035, 3036, 3037, 3038, 3041, 3042, 3043, 3048, 3049, 3051, 3057, 3059, 3060, 3062, 3064, 3065, 3070, 3071, 3072, 3081, 3084, 3088, 3093, 3101, 3106, 3113, 3116, 3119, 3120, 3124, 3125, 3126, 3139, 3141, 3143, 3145, 3147, 3151, 3152, 3154, 3155, 3156, 3157, 3158, 3159, 3205, 3268, 3274, 3280, 3281, 3284, 3286, 3292, 3293, 3296, 3297, 3298, 3300, 3301)

The Forest should include specific areas as recommended wilderness. The suggested areas include the greater Jewel Basin, Swan Front, Elk, lands adjacent to the Mission Mountains Wilderness (Woodward, Piper, Fatty, Hemlock Elk, Glacier Slough, and Jocko Trail and Lindbergh Lake areas), Bunker Creek, upper Sullivan, Whitefish Range (Tuchuck-Whale), Holland Peak, and lands adjacent to the Bob Marshall Wilderness.

Response

Alternative B modified includes 190,403 acres of recommended wilderness. The following areas were included in the selected alternative: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale.

The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas recommended in this decision are an appropriate allocation for the Forest in consideration of the wilderness evaluation, alternative analyses, and public comments.

Recommended Wilderness—Standards and Guidelines

Comment (letter numbers 217, 2877, 2879)

The Forest should have more clear standards and guidelines for wilderness and recommended wilderness, such as, “When wildland fires occur, appropriate response strategies should be based, in part, on wilderness untrammled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation considerations; and the risk of a fire event spreading to developed areas outside of wilderness.”

The Forest should add additional plan components in the forest plan to manage wilderness character and to maintain the potential for Congress to designate these important areas in the future.

Response

The forest plan has numerous plan components for designated wilderness and for recommended wilderness. The desired conditions for both designated and recommended wilderness include language to protect and maintain wilderness character (designated wilderness) and wilderness characteristics (recommended wilderness). Management activities must be consistent with plan components.

In addition to these plan components, the monitoring guide includes monitoring questions and indicators tied to maintaining and protecting wilderness character and wilderness characteristics. For designated wilderness, the monitoring question is: Do management activities in designated wilderness areas preserve and protect wilderness character? The indicators are the score on the National Wilderness Stewardship Performance elements; the limits of acceptable change monitoring measures for the Bob Marshall Wilderness Complex and Mission Mountains Wilderness; the number and type of authorized motorized use and mechanized transport entry as reported through the USFA INFRA database; the number and type of unauthorized motorized use and mechanized transport; and the number, kind, and extent of identified actions (e.g., natural and human-caused fire) that have occurred in designated wilderness areas on the Forest.

For recommended wilderness, the monitoring question is: Do outcomes from management activities protect the wilderness characteristics of the recommended wilderness area? The indicators are the number, kind, extent, and evaluated outcomes of identified management activities (including prescribed fire) that have occurred in the recommended wilderness area and the number and type of unauthorized motorized use and mechanized transport.

Prescribed fire in wilderness is permitted by policy in Forest Service Manual 2324, which provides for the situations in which prescribed burning can occur in the wilderness. The Forest has recently successfully implemented prescribed fire in the Mission Mountains Wilderness.

Recreation

Recreation—Additional Fees

Comment (letter number 2950)

The Forest should implement an annual pass or recreation fee on the Forest for maintenance, infrastructure improvements, and staff for all recreationalists.

Response

This would be a site-specific decision. The forest plan does not authorize site-specific decisions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan.

Recreation—Commercial Use

Comment (letter numbers 2601, 2799, 2847)

The Forest should emphasize a needs assessment for outfitting and guiding that considers the extent of activities needed to jointly develop strategies to meet the Forest Service's goal of enhancing guest services with permit holders and recreation service providers.

The forest plan should have objectives for commercial recreation services to have a streamlined pathway to special recreational use permits.

Response

The forest plan includes a number of desired conditions related to outfitters and guides and special uses:

FW-DC-REC-08: New and existing outfitter and guide services respond to public needs, facilitate safe access, and provide opportunities for visitors to connect with and learn about the cultural and natural resources of the area.

FW-DC-REC-16: New and existing special-use permits serve the public interest, meet national standards, and complement the recreation settings and opportunities. Recreation special uses are used as a tool to provide desired recreation opportunities and are compatible with the recreation opportunity spectrum setting(s) in which they are permitted;

FW-DC-REC-17: Outfitters and guides on the Forest provide high-quality public service, ensure public health and safety, protect natural resources, avoid degradation of the social setting and minimize conflict with other users.

Objectives to have a streamlined pathway for commercial recreation services is beyond the scope of the forest plan because forest plans establish broad direction, similar to zoning in a community.

Recreation—Developed Areas

Comment (letter numbers 227, 2888)

The Forest should have plan components that designate a portion of developed campgrounds to be generator free.

The Forest should reduce the number, capacity, and concentration of developed sites and increase enforcement where food storage orders are being violated. The Forest should consider having special orders that reduce other attractants such as garbage, bird feeders, and pet or livestock food.

Response

The forest plan does not authorize site-specific activities; rather, it establishes broad direction, similar to zoning in a community. Designating a portion of developed campgrounds to be generator free does not fit in within the broad programmatic direction, but it could be done at the project level.

Alternative B modified does not have plan components that reduce the number, capacity and concentration of developed sites. Standard FW-STD-REC-01 limits new overnight developed

recreation sites. The Forest Service monitors and enforces compliance with its regulations, including the food and attractant storage orders. The Forest currently has special orders for food/wildlife attractants. Forestwide standard FW-STD-WL 02 states that food/wildlife attractant storage special orders shall apply to all NFS lands in the primary conservation area and zone 1.

Recreation—Dispersed Areas

Comment (letter number 2880)

The Forest should have more opportunities for dispersed camping to supplement the opportunities lost due to road closures.

Response

Most areas of the Forest are open to dispersed camping, but motorized access to dispersed camping sites has decreased through the decommissioning and closure of roads, limiting public access to some of these areas. The Forest has decommissioned 787 miles of road since 1995. The forest plan does not have plan components to increase motorized access in roads or areas that were previously closed. Forest plan direction includes FW-DC-REC-12: “There are sustainable dispersed recreation opportunities across the Forest. Dispersed recreation opportunities are compatible with the desired recreation opportunity spectrum setting and are managed to minimize user conflicts and environmental impacts.”

Recreation—Funding

Comment (letter number 330)

The Forest should increase funding and focus on recreation and on trail and campground maintenance.

Response

Forest plans do not make budget decisions. Should Congress emphasize specific programs by appropriation, a redistribution of priorities would follow, regardless of the alternative implemented.

Recreation—General

Comment (letter numbers 37, 81, 200, 219, 315, 2879, 3004, 3025, 3027, 3145)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should increase recreation opportunities for motorized use, bicycle riding on trails, horseback riding, and dispersed camping.
2. The Forest should marked trails and areas for primary uses to help reduce conflicts, such as mountain bike trails versus hiking trails, snowmobiling areas versus skiing areas. This would help reduce conflict and help manage usage by designating certain primary uses to individual trails.
3. The Forest should do a better job with its signage of trails throughout the Forest; many trailhead signs have been missing for years or are in serious disrepair.

4. The Forest should assess site-specific routes and play areas to consider current use, realities on the ground, and wildlife values.
5. The Forest should have areas in the frontcountry that are for foot and stock travel only.
6. The Forest should use the travel management objectives and trail classifications for trails that are Forest Service policy. An example of this is that all of the trails on Spotted Bear and the vast majority of trails on both the Glacier View and Hungry Horse Districts are classified as Class 2 trails and yet the Flathead National Forest has chosen to not follow the law and has let mountain bikes and motorized hijack the trail system.
7. The Forest should not develop the Abbot Bay boat ramp area. It is already hard to find a place to launch a boat without having to pay a concessionaire.
8. The Forest should not sell, trade, etc., the property located west along Highway 2 that is known as the old campground.
9. The Forest should look at pack rafts and how they impact the wilderness.

Response

1. The forest plan has numerous plan components related to motorized recreation. In addition, the following objectives are related to motorized and mountain bike opportunities: GA-SM-OBJ-01, GA-NF-OBJ-02, and GA-SV-MA7-Crane-OBJ-01. Dispersed camping is available on the majority of the Forest except in developed recreation sites.
2. The Forest does not designate single-use trails. Each trail is assigned a trail management objective that documents the intended purpose and management of the trail based on management direction, including access objectives. This also includes a trail class, which prescribes the scale of development for the trail that represents its intended design and management standards. A motor vehicle use map shows the trails and roads that are open to motor vehicles. A visitor use map shows trails and their travel management.
3. Your comment is noted and has been directed to the Forest's recreation program manager.
4. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan.
5. The forest plan does not include a management areas designation of frontcountry. However, the Forest does have a focused recreation area management area (management area 7). These areas vary in terms of what is allowed within the area. These areas are described in the appropriate geographic areas under management area 7.
6. The forest plan includes FW-DC-IFS-07, which states: "Road management objectives and trail management objectives are identified and current for roads and trails. Roads and trails are maintained in accordance with road and trail management objectives." Roads and trails are connected to State, county, city, private, tribal, and other Federal roads and trails. How the Forest utilizes the trail classification on specific districts is beyond the scope of the forest plan.

7, 8. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Developing the Abbot Bay boat ramp area and selling or trading the property known as the old campground are site-specific activities.

9. The final EIS did not look at specific recreational equipment and their effects on wilderness.

Recreation—Hunting and Trapping

Comment (letter numbers 200, 2905, 3262)

The Forest should have more lands or roads closed or should maintain roadless areas for better hunting opportunities. The Forest should keep public land open for hunting and trapping. The Forest should open up a year-round season for wolves.

Response

The responsible official strives to provide for multiple uses and the proper management of all resources, considering ecological, social, and economic sustainability. Road closures increase habitat security for wildlife and nonmotorized hunting opportunities but decrease opportunities for motorized hunting and trapping. The forest plan incorporates a comprehensive approach to managing human activities to meet wildlife objectives while maintaining public access for multiple uses and contributing to social and economic sustainability (36 CFR 219.8, Sustainability; 36 CFR 219.10, Multiple Use). Hunting and trapping on National Forest System lands are subject to State fish and wildlife laws and regulations. As discussed in the EIS in sections on species such as the Canada lynx, wolverine, and gray wolf, the state of Montana monitors populations and closes or limits hunting and trapping to meet population goals. Also see the comments and responses under Canada Lynx—Lynx Trapping.

Recreation—Limit and Remove Fees

Comment (letter numbers 2905, 3025, 3027)

The Forest should not have pay campsites and online reservations for campsites on the South Fork.

The Forest should not develop Lion Lake to have fees, host sites, motors on the lake, a campground, or a gate.

The Forest should not develop the FK&L area on Hungry Horse Reservoir at Emery Bay as a fee campground.

Response

The forest plan does not authorize site-specific activities; rather, it establishes broad direction, similar to zoning in a community. Deciding whether a campground should be a fee or non-fee campground or part of the on-line reservation system does not fit in within the broad programmatic direction. These types of decision are site-specific decisions that are made following appropriate procedures.

Recreation—Motorized Over-Snow Vehicle Opportunities

Comment (letter numbers 10, 39, 219, 225, 232, 2588, 2847, 2849, 2851, 2860, 2905)

The Forest should increase the amount of areas for snowmobiles because much of the area suitable for motorized over-snow vehicle use is not rideable. In addition, wildlife moves to the lower elevations in the winter, leaving the upper elevations available for snowmobiling.

The Forest should allow more areas to be suitable for snowmobiling as the technology for snowmobiling keeps getting stricter for sound and emissions. In the future, snowmobiles and motor bikes will likely be battery powered, hence will have zero emissions and zero sound, and closing down areas now will cause major problems in the future when these machines cause no harm, emissions, noise, etc., to the environment, yet are prevented from traveling in these areas.

The Forest should allow more areas to be open to snowmobiling so that the current areas open to snowmobiling are not overused.

The Forest should not close any additional areas to snowmobiling because of their positive local economic impact as well as their lack of effect on wildlife populations.

Response

The Flathead National Forest made a decision for winter motorized recreation in 2006. Changes to the over-snow suitability as reflected in alternative B modified are in response to specific issues associated with facilitating access into a non-motorized area of the Badger Two Medicine Area as well as in response to a proposal from the Whitefish Range Partnership. Under the action alternatives, areas identified as suitable for motorized over-snow vehicle use have been shifted to improved riding areas based on consideration of rideability, public input, and wildlife concerns. It is true that some species of wildlife move to lower elevations in winter, but species such as the mountain goat or wolverine do not. The Forest considered these factors when developing the alternatives. The areas identified for additional over-snow opportunities have been identified by motorized users as desirable to meet their needs, while the areas identified as not suitable in alternative B modified have higher wildlife value as well as terrain that is not generally conducive to winter motorized recreation.

Recreation—Motorized Over-Snow Vehicles, Forest Plan Components

Comment (letter number 59)

The Forest should keep plan components such as FW-STD-REC-03 and 05 and FW-GDL-REC-05 in the final plan because they provide forestwide direction for how motorized over-snow vehicles should be managed.

The Forest should include a standard in the forest plan that sets a minimum snow depth of 18 inches for cross-country motorized over-snow vehicle travel and 12 inches for travel on groomed trails to protect soils and vegetation.

The Forest should clearly identify motorized over-snow vehicle use restrictions based on wildlife needs, water quality considerations, average snow depth figures, and other relevant information, with those restrictions serving as bookends and minimum snow depth requirements providing an additional limitation on use.

Response

Plan components for winter recreation have been retained in the final plan. A standard for minimum snow depth would be exceedingly challenging to implement and enforce across the Forest due to the variability of snow depth throughout the winter season. Amendment 24 rigorously evaluated the effects of motorized over-snow recreation as it related to effects on water quality, soils, and wildlife and found no justification for a snow depth trigger for when motorized over-the-snow vehicle use could occur. It is extremely rare for snow machines to operate in areas of insufficient snow depth.

Recreation—Motorized Over-Snow Vehicles, General

Comment (letter numbers 59, 257, 2574, 2869, 2940)

The Forest should keep the motorized over-snow recreation opportunities in Lost Johnny and Sixmile and in the Challenge-Skyland groomed trail area, as depicted in alternatives B and D.

The forest plan should provide a stronger programmatic framework for management of motorized over-snow vehicle use and subsequent implementation-level winter travel planning that will designate particular areas and routes based on the minimization criteria and other relevant regulatory requirements.

The forest plan should include objectives that implementation-level winter travel planning will be completed within three years of forest plan approval and that unsuitable areas will be subject to appropriate closure orders within one year of plan approval.

The Forest should have the final plan include a standard setting a minimum snow depth of 18 inches for cross-country over-snow vehicle travel.

The forest plan should include additional suitability determinations for over-snow vehicle use based on terrain, snowpack, wildlife habitat, and other conditions that impact over-snow vehicle travel.

The forest plan should include a clear statement that subsequent area and route designations will be consistent with suitability determinations and winter recreation opportunity spectrum classifications but that not all suitable, motorized areas will necessarily be open to motorized over-snow vehicle use; instead, the Forest will designate discrete open areas and trails within those areas that are located to minimize resource impacts and conflicts with other recreational uses.

The Forest must assess whether existing designation decisions in amendment 24 satisfy the minimization criteria and reflect current circumstances.

The Forest should clarify in the final plan and the final EIS language about whether and to what degree the Forest Service intends to conduct implementation-level winter travel management planning to satisfy subpart C or rely on plan-level suitability determinations for over-snow vehicle use, along with the existing amendment 24 designations for the Whitefish Range. For instance, the draft plan correctly recognizes that “travel management decisions are separate, project-level decisions that determine the specific areas and routes for motorized recreation consistent with areas identified in the plan as suitable for motorized recreation use” and that “just because an area is suitable for motorized use, does not mean motorized use is allowable everywhere in that setting.” However, the draft plan and the EIS also suggest that figures B-03 and B-04 depict adjustments to specific area and route designation decisions made in amendment 24.

The Forest should clarify in the final plan and the final EIS that programmatic forest plan decisions such as suitability determinations will be followed by implementation-level travel planning to designate discrete areas and routes where over-snow vehicle use is allowed, based on the executive order minimization criteria and site-specific NEPA analysis.

The Forest should use site-specific ecological conditions in making forest plan decisions about suitable uses in portions of the national forest and list which conditions related to wildlife use and effects were taken into account.

Response

The Flathead National Forest complied with travel management regulations, including the consideration of minimization criteria, in 2006 when amendment 24, the Winter Motorized Recreation Plan, was completed. Changes to motorized over-snow vehicle suitability were made in response to collaborative input, public comments, and resource needs (see also the comments and responses under Recreation—Motorized Over-Snow Vehicles, Maps). These changes are reflected in alternative B modified, and the effects of these suitability changes have been evaluated in the final EIS in the appropriate resource areas. The draft record of decision discusses alternative B modified at length and compliance with 26 CFR 212 and 261. Subsequent site-specific environmental analysis of motorized use of these areas would need to be conducted in order for areas identified as suitable for motorized over-snow vehicle use to be authorized or for areas now suitable for motorized over-snow vehicle use to be closed. Timeframes for when the environmental analysis will be conducted are not known at this time.

For discussion of a standard for minimum snow depth, see the comments and responses under Recreation—Motorized Over-Snow Vehicles, Forest Plan Components.

Recreation—Motorized Over-Snow Vehicles, Maps

Comment (letter numbers 59, 2801, 2864)

The Forest should document how amendment 24 complies with the motorized over-snow vehicle rule. Amendment 24 designates specific routes and areas for motorized over-snow vehicle use in the Whitefish Range, but outside of the Whitefish Range, motorized over-snow vehicles are allowed across vast areas that generally match the recreation opportunity spectrum settings and should not be a substitute for travel management designations.

The Forest needs to go further than the motorized over-snow vehicle suitability map to indicate precisely within the suitability areas where over-snow vehicle use will actually be allowed and reflect this in an improved over-snow vehicle use map.

The Forest should include plan components that limit or end late-season motorized over-snow vehicle use, as described in alternative C.

The Forest should clearly indicate on the map legend what represents the current state of travel planning. It appears this is what is considered “currently suitable” under each particular alternative, but the currently suitable areas should be the same under all alternatives. How it is shown now, where snowmobiling is currently suitable and where it is proposed as suitable, is confusing.

Response

The final EIS and draft record of decision for amendment 24 discuss the compliance with the travel management rule (36 CFR Parts 212, 251, 261, and 295) and how the amendment 24 motorized over-snow vehicle use decision minimizes effects on other resources. Since then, the Forest has been monitoring motorized over-snow recreation, including late-season use, and has not found that the effects of this late-season activity warrant changes to the areas and/or dates for this activity. For each alternative, the map shows changes relative to what is currently suitable; what is identified as suitable that is not now suitable; and what is currently suitable that is identified as not suitable. Future site-specific decisions would need to comply with identified suitability for the selected alternative. The changes to motorized over-snow vehicle use suitability reflected in alternative B modified are because of the recommended wilderness allocation in the Slippery Bill-Puzzle area or are in response to a collaborative agreement with the Whitefish Range Partnership. Other suggested changes were considered as part of alternative development, and the associated suitability of motorized over-snow vehicle use varied accordingly.

The motorized over-snow vehicle use suitability map has been revised to better show where the areas that are currently suitable and not suitable to motorized over-snow vehicle use are located.

Recreation—Motorized Use

Comment (letter numbers 1, 51, 319)

The Forest should include plan components for additional motorized all-terrain vehicle miles in alternatives A and B.

The Forest should not convert motorized routes to nonmotorized trails.

The Forest should conduct adequate site-specific data, studies, and analysis, as required by the Three-State Off-highway Vehicles final EIS and record of decision. There continues to be a serious deficiency in the analysis that must be adequately addressed. This inadequacy includes lack of site-specific studies for each route proposed for closure, including wildlife studies and site-specific user data.

Response

Alternative B modified includes plan components for additional all-terrain vehicle trails. Objective GA-SM-OBJ-01 reads: “Construct and designate approximately 1 to 4 miles of motorized trail connectors that provide high-elevation loop opportunities outside the NCDE primary conservation area and Salish demographic connectivity area, where consistent with desired recreation opportunity spectrum settings.” Alternative A is the no-action alternative and reflects the current forest plan.

The forest plan has no plan components that would convert motorized trails to nonmotorized trails.

Alternative B modified is not a travel planning document. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Travel planning at the Forest level would be considered a site-specific activity.

Recreation—Multiple Use/Balanced Use

Comment (letter numbers 37, 51, 76, 82, 164, 188, 192, 294, 202, 287, 322, 2581, 2588, 2589, 2592, 2593, 2602, 2609, 2625, 2626, 2627, 2789, 2817, 2818, 2853, 2854, 2857, 2871, 2883, 2884, 3025, 3055, 3067, 3130, 3274, 3287)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should balance the trails between horse/nonmotorized trails and all-terrain vehicle trails (motorized trails) and provide all-terrain vehicle trails that are 50 to 100 miles long. Hikers and horses have almost 10 times the trail miles available as summer motorized recreation—this is not fair or reasonable.
2. The Forest should keep Alpine Trail #7 and its connector trails open (Columbia Mountain, Peters Ridge, Jimmy Ridge, Strawberry Lake, Sixmile, Wire Creek, Bond Creek, etc.) to mountain biking and dirt biking.
3. The Forest should keep the status quo in terms of motorized trails.
4. The Forest should mark trailheads for multiple use and have specific days for user groups that give them the right of way.
5. The Forest should manage the areas around Hungry Horse, Martin City, Coram, and Lion Lake as more residential types of areas; they should be managed for humans, not bears, and should allow for motorized use.

Response

1. There is no requirement to balance nonmotorized and motorized trails on the Forest. The Forest currently has 226 miles for motorized wheeled vehicles, which is about 10 percent of the Forest's trail system, and about 31 percent of the Forest is identified as suitable for motorized over-snow vehicle use, with 295 miles of trail open from December 1 to March 31, 623 miles open from April 1 to November 30, and 1,046 miles of trails open year-long, conditions permitting, for motorized over-snow vehicle use. There are constraints on roads and motorized use on the Forest to address habitat requirements for species such as the grizzly bear and bull trout.
2. In the forest plan, the section of the Alpine Trail #7 (the Swan Crest Trail) that is currently open to mechanized transport and motorized use remains open to mechanized use. Wire, Bond Creek, Sixmile, Peters Ridge, Jimmy Ridge, and Strawberry Lake are open to mountain biking and two-wheeled motorcycles.
3. The forest plan does include plan components that increase the access for motorized wheeled vehicles, where it is compatible with desired conditions, standards, and guidelines. See plan component GA-SM-OBJ-01: "Construct and designate approximately 1 to 4 miles of motorized trail connectors that provide high-elevation loop opportunities outside the NCDE primary conservation area and Salish demographic connectivity area, where consistent with desired recreation opportunity spectrum settings." Alternative A is the no-action alternative and reflects the current forest plan.
4. The Forest relies on the motor vehicle use map to show which trails are open to motorized use. In addition, the Forest's visitor map shows trails open to a variety of different users. Generally,

trailheads are signed to indicate the type of use that is allowed on the trail, but sometimes these signs are removed or vandalized.

The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Specifying days when user groups have the right of way is a site-specific activity not covered in the forest plan.

5. The NFS lands around Hungry Horse, Martin City, Coram, and Lion Lake are within the recovery zone/primary conservation area of the grizzly bear. Areas that allow for motorized use near the communities of Hungry Horse, Coram, and Martin City are as follows: the Hungry Horse off-highway vehicle area, Cedar Flats off-highway vehicle area, and specific areas along the Hungry Horse Reservoir when at low pool.

Recreation—National Trails

Comment (letter numbers 51, 217, 2574, 3006, 3061)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should reevaluate the Continental Divide National Scenic Trail between McDonald Pass and Jericho Mountain and Bison Mountain South because it was illegally closed to motorized recreationists by a past action. The Flathead forest plan should also mitigate for that illegal closure by reopening this section of Continental Divide National Scenic Trail to motorized recreationists as required by the original legislation.

2. The Forest should consult with the Pacific Northwest National Scenic Trail Advisory Committee on the location of the Pacific Northwest National Scenic Trail and on proposed management direction.

3. The Forest should address scenery as a standard (scenic integrity objectives), and the guidance should also address providing for primitive and semiprimitive nonmotorized recreation opportunity spectrum settings in the Pacific Northwest National Scenic Trail corridor.

4. The Forest should use the forest plan revision process to perform a programmatic optimum location review and identify location recommendations, which should be transmitted through the lead National Scenic Trail regional forester to the Chief for approval.

5. The Forest should allow mountain bike access on the Pacific Northwest National Scenic Trail and on those trails that cross into the Kootenai to have a consistent approach that maintains mountain bike access across both Forests.

6. The Forest should recognize and identify the Ralph Thayer Memorial National Recreation Trail and the Smoky Range National Recreation Trail as national trails on the Flathead National Forest, and both trails should be identified and recognized as national trails in any and all subsequent text throughout the plan.

Response

1. The opening of this segment of the Continental Divide National Scenic Trail to motorized use would be a site-specific decision. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan.
2. The Pacific Northwest National Scenic Trail Advisory Committee and interdisciplinary team is currently working on a comprehensive trail management plan for the Pacific Northwest National Scenic Trail. The final comprehensive trail plan, the accompanying programmatic environmental analysis and decision, as well as forest plan direction are expected to provide overall management direction for the trail. The comprehensive trail management plan will determine the final location of the Pacific Northwest National Scenic Trail.
3. The scenic integrity objectives for the Pacific Northwest National Scenic Trail on the Flathead National Forest are high and very high within the trail corridor (a 1-mile corridor). See the desired scenic integrity objective, figure B-20.
4. The location and management of the Pacific Northwest National Scenic Trail is a site-specific decision. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan.
5. The Forest removed the Pacific Northwest Scenic Trail from the Tuchuck-Whale recommended wilderness area to provide the flexibility of allowing mountain bike use on the trail.
6. The Ralph Thayer Memorial National Recreation Trail and the Smoky Range National Recreation Trail are administratively designated by the Forest as recreation trails. The forest plan does not have any specific plan components for these trails. These two trails are identified on the Flathead National Forest visitor use map as national trails, but there is no additional management for these trails.

Recreation—Nonmotorized Use

Comment (letter numbers 9, 11, 16, 22, 28, 5, 67, 39, 74, 75, 76, 78, 80, 82, 83, 84, 86, 87, 90, 92, 96, 97, 99, 104, 105, 112, 116, 121, 130, 131, 136, 137, 139, 146, 148, 150, 151, 168, 178, 189, 206, 208, 211, 219, 222, 231, 241, 271, 274, 284, 287, 291, 307, 309, 310, 317, 318, 320, 321, 330, 2578, 2585, 2587, 2619, 2627, 2630, 2633, 2635, 2638, 2642, 2647, 2651, 2654, 2656, 2778, 2800, 2811, 2812, 2815, 2818, 2837, 2843, 2844, 2846, 2854, 2857, 2872, 2874, 2877, 2882, 2887, 2893, 2896, 2897, 2899, 2906, 2912, 2915, 2916, 2920, 2923, 2942, 2943, 3006, 3029, 3040, 3061, 3089, 3101, 3116, 3129, 3149, 3266, 3269, 3274, 3276, 3277)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should manage the Alpine Trail #7/Swan Crest Trail and the Whitefish Divide trail to support existing quiet, nonmotorized use.

2. The Forest should permanently close the Alpine Trail #7/Swan Crest Trail and other trails to mountain biking because traveling quietly and at a high rate of speed increase chances of a grizzly bear encounter, as well as possible problems with stock trains and hikers.
3. The Forest should not allow the greater Jewel Basin area to become motorized.
4. The Forest should not eliminate any mountain bike access and should consider increasing bike access and allowing mountain bike use in recommended wilderness. The Forest should continue to allow mountain bikes behind gated roads in the North Fork.
5. The Forest should allow mountain bike use on Alpine Trail #7/Swan Crest Trail where it travels through the Jewel Basin (particularly the area south of Strawberry Lake, north of the Trail #8 junction); on the Great Divide Bicycle Route as mapped by the Adventure Cycling Association; and on trails in the North Fork area.
6. The Forest should build bike trails on Crane Mountain; ideally, they would feature an uphill single-track route that retains a 5-8 percent grade that links into downhill routes of various skill levels.
7. The Forest should allow/continue to allow mountain biking on Sixmile, Hall Lake, Bond Creek, Jimmie Ridge, Doris Creek, Columbia Mountain, Napa Point, Middle Fork Bunker Creek, Bunker Creek, Chipmunk Peak, Bruce Creek, Peterson, Echo-Broken Leg, Strawberry, Peters Ridge, Warrior Mountain, Ralph Thayer Memorial Trail (#26), and Trail #26 in the Deep Creek/Whale Lake to Red Meadow Pass.
8. The Forest should keep the access to the Pacific Northwest Trail (#26), and it should maintain its backcountry nonmotorized designation with a small adjustment to the management area 1b boundary from the junction with the Kootenai National Forest Trail #372 to near Whale Creek.
9. The Forest should create a multiple-use nonmotorized trail network based out of the Cedar Flats area that would connect to the Haskill Basin and Big Mountain areas.
10. The Forest should create a recreational trail in the Island Unit and to Blacktail Mountain.
11. The Forest should not recommend any areas that currently are open to mountain biking as wilderness.
12. The Forest should include the following desired condition: Portions of the Alpine Trail #7 trail, as well as trails accessing Alpine Trail #7 (including Middle Fork Bunker Creek, Bunker Creek, Chipmunk Peak, and Bruce Creek) provide high-quality mountain bike opportunities not found elsewhere in the Flathead National Forest.
13. The Forest should not allow all-terrain vehicles and dirt bikes on the trails of national forests. Given the power and speed capabilities of these machines, they are dangerous to other trail users, disturb the wildlife, and are detrimental to the longevity of the trails.

Response

1. Alternative B modified does not change any access on the Alpine Trail #7/Swan Crest Trail; what is currently open to mechanized transport, motorized transport, and hiking stays the same. A portion of the Whitefish Divide Trail (north of Mount Locke) would be closed to mechanized

transport after a site-specific analysis is completed because the trail goes in and out of recommended wilderness.

2. In the forest plan, mechanized transport (mountain biking), motorized transport, and stock use are prohibited in the Jewel Basin hiking area.

3. The forest plan prohibits mechanized transport in recommended wilderness areas, which would decrease the miles of trails open to mechanized transport (mountain bikes) by 96 miles. However, the plan has two objectives to construct new mountain bike trails in the Crane Mountain and Whitefish Range vicinities.

4. A portion of the greater Jewel Basin area is in recommended wilderness, which includes the following plan component in the forest plan: “Mechanized transport and motorized use are not suitable in recommended wilderness areas.” It is not clear what constitutes the greater Jewel Basin. In the general vicinity of the Jewel Basin, the majority of the land is in management area 2b, 5a, 5c, and 1b. See figures B-24 to B-29 for the management area allocation by geographic area.

5. Mechanized transport (mountain biking) is allowed on portions of the Alpine Trail #7/Swan Crest Trail, but not where it travels through the Jewel Basin hiking area (particularly the area south of Strawberry Lake and north of the Trail #8 junction). The Great Divide Bicycle Route as mapped by the Adventure Cycling Association in the North Fork area follows open roads (Trail Creek Road and Red Meadow Road).

6. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Specific decisions regarding bicycle trails in the Crane Mountain area are site-specific decisions.

7. The trails listed all allow mechanized transport—Sixmile (Sixmile Lookout and Sixmile Sidehill trails), Napa Point (Napa Lookout Trail), Peterson (Peterson Creek Trail), Strawberry (Strawberry Lake Trail), Warrior (there is no trail by that name, but the trails all around Warrior Mountain allow mechanized transport) and trail #26 in the Deep Creek/Whale Lake to Red Meadow Pass. Due to recommended wilderness allocation, the following trails would be closed to mechanized transport (bicycles) after site-specific analysis: Trail # 11 in Whale Creek which goes up to Trail # 26 from an open road (Trail #26 is outside recommended wilderness); Trail # 26 where it is part of the Pacific Northwest National Scenic Trail is outside recommended wilderness, but north of the Tuchuck-Whale recommended wilderness area, it goes in and out of recommended wilderness.

8. Under alternative B modified, the Pacific Northwest National Scenic Trail is not within the Tuchuck-Whale recommended wilderness area.

9, 10. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Creating a multiple-use nonmotorized trail network based out of the Cedar Flats

area to connect to the Haskill Basin and Big Mountain Areas and designating trails in the Swan Lake Island Unit area and Blacktail Mountain or closing the Alpine Trail #7/Swan Crest Trail to mechanized use are considered site-specific activities

11. Alternative B modified includes 190,403 acres of recommended wilderness. The following areas were included in the selected alternative: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale. A site-specific analysis would need to be completed to close 82 miles of mechanized trails (mountain bike) in the Tuchuck-Whale recommended wilderness area; 1 mile in the Java-Bear recommended wilderness area; 8 miles in the Limestone-Dean recommended wilderness area; and 4.0 miles in the Slippery Bill recommended wilderness area.

12. Thank you for your comment. Alternative B modified does not include that desired condition.

13. Alternative B modified does not close any trails to motorized use. About 226 miles of trails allow wheeled motorized use.

Recreation—Objectives

Comment (letter numbers 290, 2574, 2876, 3061)

The Forest should disclose in the final EIS how FW-OBJ-REC-01 to rehabilitate five to seven dispersed recreation sites on the Forest with erosion or sanitation issues was determined to be adequate.

The Forest should add a new objective to develop/construct three to four trail networks.

Response

As required by the planning rule (36 CFR 219.1(g)), the responsible official must ensure that plan components are within the fiscal capability of the planning unit. After discussions with recreation specialists on the Forest, this objective in the forest plan was increased to the rehabilitation of eight to ten dispersed recreation sites with erosion or sanitation issues. If more money becomes available, additional sites could be rehabilitated.

The forest plan includes desired conditions and objectives for additional trails. Specific plan components for trails are found under the geographic areas. For instance, the Swan Valley geographic area includes a desired condition and objective to build mountain bike trails in the Crane Mountain area. The North Fork geographic area includes an objective to complete one to three trails that provide for mountain bike opportunities in the Whitefish Range vicinity. The Salish Mountains geographic area has an objective to construct a nonmotorized trail that connects NFS lands in the vicinity of Blacktail Mountain to trails on other ownerships in the Foy's Lake area (Foy's to Blacktail trail system).

Recreation—Off-Road Vehicles and Motorized Use

Comment (letter numbers 1, 48, 51, 178, 190, 192, 230, 237, 239, 279, 287, 289, 307, 322, 2575, 2581, 2588, 2596, 2602, 2605, 2609, 2612, 2616, 2621, 2625, 2626, 2636, 2650, 2789, 2801, 2816, 2826, 2827, 2840, 2853, 2858, 2870, 2884, 2895, 2903, 2905, 2918, 2941, 2942, 3025, 3027, 3079, 3123, 3153, 3270)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should provide all-terrain vehicle loops that are 50 to 80 miles long and enhance and expand all-terrain vehicle opportunities across the Forest to better provide meaningful all-terrain vehicle experiences. The Flathead National Forest should not reduce any more motorized opportunities; Alpine Trail #7 should stay open to motorized and mountain bike use as well as trails on the Tally Lake Ranger District (Ashley Mountain/Reid Divide/Trail #800 area).
2. The Forest should acknowledge electric bikes as motorized and restrict their use accordingly (not allow them on closed roads). The Forest should allow a limited amount of e-bike use on trails.
3. The Forest should keep at least 75 percent of the roads and trails outside of wildernesses open at least seasonally to motorized access (Flathead County Natural Resources Plan) to reflect public desire for all-terrain vehicle use on NFS lands.
4. The Forest should keep the objective stated in the forest plan to build new connector trails and reopen previously closed trails without recreating entire new trails.
5. The Forest should improve signage at trailheads to make it clear where motorcycles are allowed and where utility-type vehicles and all-terrain vehicles are not allowed. In addition, dirt bikes should be allowed on single track and all-terrain vehicles should not be allowed.
6. The Forest should reopen trails that have been closed to motorized use to compensate for the excessive amount of past motorized closures.
7. The Forest should identify within the forest plan the creation of a summer wheeled motorized zone along the southeastern edge of the Whitefish Range where there is the potential for increased single-track routes and loops. Portions of this potential summer wheeled motorized zone have been included as the Cedar Flats Off-Highway Vehicle area, and another portion has been included as part of the Crystal-Cedar management area 7 area. The rest of it up to Big Creek, as per the Whitefish Range Partnership map (appendix A: Summer Motorized, p. 2), is identified under the recreation opportunity spectrum semiprimitive motorized (under all action alternatives) and is proposed as management area general forest 6a or 6b, depending on the alternative.

Response

1. The Forest agrees that motorized loops are desirable for users. Alternative B modified includes several plan components related to this. GA-SM-DC-02 states: “Outside the NCDE primary conservation area and the Salish demographic connectivity area, motorized trails (single-track or off-highway vehicles) provide high-elevation loop opportunities.” GA-SM-OBJ-01 states: “Construct and designate approximately 1 to 4 miles of motorized trail connectors that provide high-elevation loop opportunities outside the NCDE primary conservation area and Salish demographic connectivity area, where consistent with desired recreation opportunity spectrum settings.” FW-DC-IFS-04 states: “Loop opportunities are a part of both the road and trail systems.”

In addition, the GA-SM-MA7-Blacktail OHV-DC-01 states: “The Wild Bill Off-Highway Vehicle National Recreation Trail provides yearlong recreation opportunities close to local communities. Wheeled motorized vehicle use occurs on designated routes, with loop trails and trail connectors to the Blacktail and Truman Creek Off-Highway Vehicle Trail systems. Challenge features for off-highway vehicles are provided along a portion of the trail system.” There is also a monitoring indicator to see whether the Forest is moving towards this desired condition and implementing the

objectives. Indicator IND-REC-10 is: “Construction and designation of motorized trail connectors that provide high-elevation loop opportunities.”

Alternative B modified does not change the current mountain bike or motorized access on Alpine Trail #7 or in the Ashley Mountain/Reid Divide/Trail #800 area.

2. Alternative B modified does acknowledge that electric bikes are motorized transport and are not considered nonmotorized transport. Electric bikes are allowed on trails that currently allow motorized use; they are not allowed on trails closed to motorized use.
3. There is no Forest Service policy that says the Forest must have a certain percentage of roads or trails open to motorized use.
4. The forest plan includes an objective in the Salish Mountain geographic area to construct 1 to 4 miles of motorized trail connectors that provide high-elevation loop opportunities outside the NCDE primary conservation area and Salish demographic connectivity area, where consistent with desired recreation opportunity spectrum settings. However, there is no objective in the forest plan to reopen previously closed trails instead of building new trails.
5. Your comment is noted regarding signing at trailheads. The Forest also relies on the motorized vehicle use map to display where motorized use is allowed. The majority of wheeled motorized trails on the Forest allow both motorcycles (dirt bikes) and all-terrain vehicles; however there are a few trails that *only* allow motorcycles and a few trails that *only* allow all-terrain vehicles. The Motor Vehicle Use Map for each district specifically shows which trails are open to which type of vehicles.
6. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Opening closed trails is a site-specific activity.
7. The forest plan includes GA-NF-MA7-Cedar Flats OHV-DC-01 and GA-NF-MA7_Crystal-Cedar-DC-02, which specify the desired condition for motorized recreation in management area 7 along the southeastern edge of the Whitefish Range. Motorized access would be evaluated at the site-specific level and would be guided by the appropriate plan components.

Recreation—Recreation Opportunity Spectrum, Allocation

Comment (letter numbers 108, 2904)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should change the recreation opportunity spectrum map. The North Fork geographic area should reflect alternative C’s recreation opportunity spectrum summer map and part of alternative B’s recreation opportunity spectrum summer map only in the area between Big Creek Road #316 and Columbia Falls east of and not inclusive of Standard Peak. See the Whitefish Range Partnership agreement map for this area and their request that summer, wheeled motorized be evaluated in certain areas. The Whitefish Range Partnership did not provide a blanket endorsement of wheeled summer motorized in this area but stipulated that such activity

should be given the opportunity for review and evaluated based on existing laws, regulations, and other constraints.

2. The Forest should make sure the spatial allocation of recreation opportunity spectrum settings is compatible with and even reinforces other management prescriptions. The desired conditions in the forest plan appear to merely maintain recreation opportunity spectrum settings rather than ensure achievement of the substantive provisions related to ecological integrity, sustainability, and diversity. For example, desired condition FW-DC-REC-18 states that “additional groomed motorized over-snow vehicle routes are provided that are consistent with the desired winter recreation opportunity spectrum settings, where compatible with other resources.” See also FW-STD-REC-03: “New motorized routes or areas available to the public shall not be designated in primitive or semi-primitive non-motorized desired recreation opportunity spectrum settings (winter and summer).” None of the recreation plan components ensure achievement of the substantive provisions related to ecological integrity, sustainability, and diversity.

3. The Forest should integrate resource and recreation management allocations and prescriptions to achieve the substantive ecological and sustainability provisions in 219.8. The Forest Service should seek to assign recreation opportunity spectrum settings to facilitate achievement of the substantive ecological integrity and diversity provisions. For instance, areas that serve as important habitat for species of concern or priority watersheds could be assigned a nonmotorized recreation opportunity spectrum class where enjoyment of natural scenery and processes is emphasized.

Response

1. See figures B-16 and B-17 in the forest plan that depict the desired recreation opportunity spectrum for the North Fork geographic area. The designation of an area as suitable for motorized use does not mean motorized use is allowable everywhere in that setting (semiprimitive motorized, roaded natural, rural, or urban). The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Any additional motorized use in the Big Creek area would need to have a site-specific analysis completed before that use could be authorized.

2. The recreation opportunity spectrum is a system by which existing and desired recreation settings are defined, classified, inventoried, and monitored. Classifications are based on physical, social, and managerial attributes. In the forest plan, there are desired conditions for both winter and summer recreation opportunity spectrum classes. Sustainable recreation is defined in the 2012 planning rule as the set of recreation settings and opportunities on National Forest System lands that is ecologically, economically, and socially sustainable for present and future generations. Recreation setting is the social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities. The Forest Service uses the recreation opportunity spectrum to define recreation settings and categorize them into six distinct classes: primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban. Recreation opportunity is the chance to participate in a specific recreation activity in a particular setting to enjoy desired recreation experiences and other benefits that accrue. Recreation opportunities include nonmotorized, motorized, developed, and dispersed recreation on land, on water, and in the air. Access, in the context of sustainable recreation, is the mode of transportation (foot, horse, bicycle, motorized vehicle, boat, or plane) and associated

infrastructure (road, trail, airstrip, or boat launch) used to engage in recreation activities in specific recreation settings on National Forest System lands. Therefore, the recreation opportunity spectrum is the framework to integrate the discrete components (access, infrastructure, and scenic character) of recreation settings and opportunities. The desired recreation opportunity spectrum as mapped in the forest plan is integrated with other resources and does reflect ecological sustainability. See Moore (2017) for a discussion of how the desired recreation opportunity spectrum was mapped on the Forest.

3. As required by the National Forest Management Act of 1976 and the 2012 planning rule, all projects and activities authorized by the Forest Service after the record of the decision for the forest plan must be consistent with the applicable plan components (36 CFR § 219.15). A project or activity approval document must describe how the project or activity is consistent with applicable plan components by meeting the following criteria: For desired conditions, the project or activity contributes to the maintenance or attainment of one or more desired conditions or does not foreclose the opportunity to maintain or achieve any desired conditions over the long term. The desired recreation opportunity spectrum is integrated with other resources in the forest plan. See Moore (2017) for a discussion of how the desired recreation opportunity spectrum was mapped on the Forest.

Recreation—Recreation Opportunity Spectrum, Desired Conditions

Comment (letter numbers 290, 2876, 3006)

The Forest should include plan components to increase the quantity and accessibility of trails on the Forest because of the expected increased recreational use (of all types) in the future. Crowding of trails will lead to a diminished user experience and will likely also lead to increased user conflict. There should be a forestwide desired condition (FW-DC-REC) to accommodate the existing desire for a greater number of trails as well as to accommodate expected increases in the future.

Response

In the forest plan, there are desired conditions as well as objectives related to trails. There is not an overall plan component to increase the amount of trails on the Forest; instead, there is a desired condition (FW-DC-IFS-11) to have a sustainable trails system on the Forest. FW-DC-IFS-06 through 11 relate to the overall trail program. However, the forest plan does have plan components that add new trails to specific areas. See GA-SM-OBJ-01 and 02, GA-SV-MA7-Crane-DC-01 and GA-SV-MA7-Crane-OBJ-01; GA-SM-MA7-BlacktailOHV-DC-01; GA-SM-MA-7-Blacktail Foyes-DC-01; GA-SM-MA7-Big Mtn-DC-01 and 06; and GA-SV-MA7-Ingalls Mountain-DC-01.

Recreation—Recreation Opportunity Spectrum, Management

Comment (letter numbers 59, 108, 2904)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should better integrate the recreation opportunity spectrum and management of wildlife winter range. A comparison of the winter recreation opportunity spectrum maps for each alternative and maps of big game winter range on the Forest show that none of the alternatives manage all of the big game winter range on the Forest as nonmotorized in winter. The Forest

should manage big game winter range as either a winter recreation opportunity spectrum primitive or semiprimitive nonmotorized setting.

2. The Forest should explain in the final EIS how management direction across each Forest, for each use, fits within the recreation opportunity spectrum setting for any particular area. More detail in the plan on what the different settings and characteristics for each recreation opportunity spectrum category are would be a good first step, as it's difficult for managers to attain a desired condition without clear guidance on what that desired condition is. The Forest should specify plan components that will help the Forests achieve the desired conditions associated with each recreation opportunity spectrum setting, which is necessary if the recreation opportunity spectrum is to be a meaningful management tool.

3. The Forest should not include the area east of the town of Swan Lake (Wire Trail #78 to Alpine Trail #7 to Bond Creek Trail #21) as semiprimitive and primitive (nonmotorized) recommendations. This trail corridor offers exceptional wilderness quality experiences and should be managed for such. As the human population increases, such close-to-town trails should be managed for foot and horse use and wildlife security and grizzly core, not for motorized wheeled summer recreation.

4. The Forest should not rely only on management areas based on existing uses (motorized or nonmotorized) and other management to determine recreation opportunity spectrum classes. The Forest Service states that it determined suitability for motorized and nonmotorized recreation based on management areas.

5. The Forest should set a timeline for closing the gap between existing recreation opportunity spectrum settings and the desired recreation opportunity spectrum settings and identify prioritized tasks—in the form of standards and guidelines—for driving that transformation.

6. The Forest should develop a coherent system of sustainable and socially compatible recreation opportunities as per direction in the planning directives that the Forest Service should describe its desired recreation opportunity spectrum settings, identify the gap that exists between the existing and desired settings, and develop plan components necessary to close the gap in a specific amount of time.

7. The Forest should make sure that recreation opportunity spectrum settings are compatible with the recreation niche, as well as the plan area's broader distinctive role and contribution within the broader landscape. Rather than working to close the gap between existing and desired settings, the forest plan components merely maintain the status quo as determined by the management area decisions. For example, "Additional groomed motorized over-snow vehicle routes are provided that are consistent with the desired winter recreation opportunity spectrum settings," and FW-DC-REC-19, "Provide groomed nonmotorized winter trail systems that accommodate existing and anticipated demand that are consistent with the desired winter recreation opportunity spectrum setting."

8. The Forest should categorize recommended wilderness areas as primitive or semiprimitive nonmotorized recreation opportunity spectrum classifications to ensure the management direction within the forest plan is consistent across management schemes.

Response

1. The recreation opportunity spectrum is a system by which existing and desired recreation settings are defined, classified, inventoried, and monitored. Classifications are based on physical, social, and managerial attributes. The desired winter recreation opportunity spectrum class delineation incorporates many factors—not just current travel management. A mapping protocol is used to map the recreation opportunity spectrum classes, and it includes factors such as minimum size requirement for semiprimitive and primitive classes, presence and density of motorized travel routes, slope, and terrain. This is then reviewed by a recreation specialist to incorporate other factors such as management area direction, other resource factors, and the desired class

As required by the National Forest Management Act of 1976 and the 2012 planning rule, all projects and activities authorized by the Forest Service after the record of decision for the forest plan must be consistent with the applicable plan components as described at 36 CFR § 219.15. A project or activity approval document must describe how the project or activity is consistent with applicable plan components. If the recreation opportunity spectrum is semiprimitive motorized, that does not mean that motorized use may occur everywhere in that class. In addition, there are plan components that guide motorized use in big game habitat, such as the following:

GA-SM-DC-04 Security from motorized disturbance exists in key winter habitat areas for big game species (e.g., Pete Ridge/Pilot Knob to Tally Lake and Rogers Lake to Smith Lake areas).

GA-SF-DC-04 Lands mapped as winter big game habitat by MFWP in the Dry Park, Horse Ridge, lower Spotted Bear River, and Danaher to Big Prairie areas provide desired winter habitat conditions.

2. The recreation opportunity spectrum is not tied to a specific management area allocation. See Moore (2017) for a discussion of how the recreation opportunity spectrum was mapped on the Flathead National Forest. The desired recreation opportunity spectrum is a plan component, and, when completing site-specific analysis, the project or activity must contribute to the maintenance or attainment of one or more desired conditions or cannot not foreclose the opportunity to maintain or achieve any desired conditions over the long term. In a site-specific analysis, an analysis would be done that compares the existing recreation opportunity spectrum to the desired recreation opportunity spectrum for a specific area, and the project would include activities that move it towards the desired recreation opportunity spectrum. Monitoring item MON-REC-04 monitors whether current recreation settings and opportunities are meeting or moving toward desired recreation settings and opportunities.

3. Recreation opportunity spectrum is more of a zoning and not a site-specific travel management decision. The current travel management on this trail would not change with the forest plan.

4. See Moore (2017) for a discussion of how the recreation opportunity spectrum was mapped on the Forest. It does factor in management areas based on existing motorized and nonmotorized uses.

5. Alternative B modified does not set a timeline for closing the gap between the existing recreation opportunity spectrum and the desired recreation opportunity spectrum. They are desired conditions, and when completing site-specific analysis, the project or activity must contribute to the maintenance or attainment of one or more desired conditions or not foreclose the opportunity to maintain or achieve any desired conditions over the long term.

6, 7. The desired recreation opportunity spectrum allocations in the Forest are compatible with the recreation niche and the plan area's distinctive role and contribution within the broader landscape. As stated in response 5 above, they are desired conditions, and when completing site-specific analysis, the project or activity must contribute to the maintenance or attainment of one or more desired conditions or not foreclose the opportunity to maintain or achieve any desired conditions over the long term.

8. Both designated and recommended wilderness areas are allocated to the primitive class of the recreation opportunity spectrum.

Recreation—Recreation Opportunity Spectrum, Standards

Comment (letter numbers 59, 2574, 2904)

The Forest should include additional plan components in the forest plan—especially standards and guidelines—that tie to the recreation opportunity spectrum in order to further integrate the recreation opportunity spectrum with forest management. The Forest should incorporate the recreation opportunity spectrum setting characteristics and plan component examples developed by the Washington Office as tools for creating plan components based on recreation opportunity spectrum classes (summer and winter).

The Forest should include a standard that makes desired recreation opportunity spectrum settings enforceable (e.g., the Forest Service will take no action incompatible with the desired recreation opportunity spectrum setting). The forest plan includes desired conditions, such as FW-DC-REC-18, that seek consistency with desired winter recreation opportunity spectrum settings. It includes one standard that prohibits new motorized routes or areas specifically in primitive or semiprimitive nonmotorized desired recreation opportunity spectrum settings, but it does not include any standards that make all of the desired recreation opportunity spectrum settings enforceable to ensure compliance with the 2012 planning rule's requirement to provide for sustainable settings.

Response

The forest plan is an integrated planning document, and the recreation opportunity spectrum is part of that integration.

As required by the National Forest Management Act of 1976 and the 2012 planning rule, all projects and activities authorized by the Forest Service after the record of the decision for the forest plan must be consistent with the applicable plan components as described at 36 CFR § 219.15. A project or activity approval document must describe how the project or activity is consistent with applicable plan components by meeting the following criteria. For desired conditions, the project or activity contributes to the maintenance or attainment of one or more desired conditions or does not foreclose the opportunity to maintain or achieve any desired conditions over the long term. The following are desired conditions specific to the recreation opportunity spectrum: FW-DC-SREC01 through 07 and FW-DC-WREC-01 through 06. In addition, the following are desired conditions that integrate the recreation opportunity spectrum: FW-DC-REC-03, FW-DC-REC-04, FW-DC-REC-12, FW-DC-REC-14, FW-DC-REC-16, FW-DC-REC-20, FW-DC-REC-21, and FW-STD-REC-03.

There are also suitability plan components for particular management areas (2a, 2b, 4a, 4b, 5b, 5c, 5d, 6a, 6b, 6c) that incorporate the recreation opportunity spectrum. A designation of a recreation opportunity spectrum class that typically has motorized use (semiprimitive motorized,

roaded natural, rural, or urban) does not mean that motorized use is allowable everywhere in that setting.

Recreation—Recreation Opportunity Spectrum, Winter

Comment (letter numbers 59, 108, 2816, 2869)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should develop winter recreation opportunity spectrum subclasses that further describe the range of recreation opportunities on the Forest based on what the Deschutes National Forest developed for their 2009 Winter Recreation Suitability Analysis—such as alpine solitude, which is a combination of primitive and semiprimitive nonmotorized—and provide opportunities for challenge and self-reliance in a wilderness setting in untracked snow.

2. The Forest should make clear in the final EIS and final plan that winter recreation opportunity spectrum settings do not preclude travel planning decisions. The recently revised travel management planning directives state, “The Responsible Official generally should avoid including travel management decisions in land management plans prepared or revised under current planning regulations. In short, when designating areas or trails available for ORV [off-road vehicle] use, agencies must locate them to: minimize damage to soil, watershed, vegetation, or other resources of the public lands; minimize harassment of wildlife or significant disruption of wildlife habitats; and minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands.”

3. The Forest cannot use the recreation opportunity spectrum classification to serve as over-snow vehicle area designations as the recreation opportunity spectrum process did not use the minimization criteria. The amendment 24 winter travel decisions are not a substitute for Subpart C winter travel planning. The final plan should explain that site-specific travel planning is needed to determine where within semiprimitive motorized, roaded natural, and rural areas motorized over-snow vehicle use will be allowed.

4. The Forest should classify the Pete Ridge area as winter recreation opportunity spectrum semiprimitive nonmotorized or primitive in the final plan as it is one of the most important white-tailed deer winter range areas in Montana.

5. The Forest should include a plan component similar to GA-MF-DC-04 for other geographic areas because winter access is an important issue across the Forest.

6. The Forest should classify the winter recreation opportunity spectrum as semiprimitive nonmotorized or primitive in order to achieve the desired conditions described for GA-SM-DC 04 and GA-SM-GDL 01. In addition, in the South Fork geographic area, the winter recreation opportunity spectrum settings for the areas listed in GA-SF-DC 04 and GA-SF-DC-05 should be semiprimitive nonmotorized or primitive in order to protect big game winter range.

7. The Forest should reassess the general open zoning for snowmobiling (suitability) and replace it as needed with a “routes and play area” approach to protect winter wildlife and nonmotorized, primitive recreation.

8. The Forest should classify the Sullivan Creek area as nonmotorized (recreation opportunity spectrum winter, alternative C) for over-snow winter use to protect wildlife and balance the potential for increased winter motorized use from the Anna Creek Cabin.
9. The Flathead National Forest should designate the Sunset Ridge area as semiprimitive nonmotorized to protect the outstanding wildlife corridor and wilderness values found there, which would balance and match the Lolo National Forest and collaborative recommendation for this area.
10. The Forest should allow motorized over-snow travel on the separate parcels of NFS land in the North Fork valley bottom that are bordered by private land so that private landowners can snowmobile between homes during the winter. Amendment 24 originally allowed motorized over-snow travel on these parcels, but during mapping those parcels were listed as closed.

Response

1. The Forest chose not to develop subclasses for the winter recreation opportunity spectrum as the Deschutes National Forest did. The Flathead National Forest used the winter recreation opportunity spectrum national mapping protocol to develop the winter recreation opportunity spectrum maps. See Moore (2017), which describes how the Forest mapped the winter recreation opportunity spectrum.
2. The winter recreation opportunity spectrum is not travel planning, nor does the Forest refer to it as such. The recreation opportunity spectrum is a system by which existing and desired recreation settings are defined, classified, inventoried, and monitored. See the draft record of decision for information on how the forest plan meets Executive Orders 11644 and 11989 regarding off-road use of motor vehicles on Federal lands.
3. The Forest did not use winter recreation opportunity spectrum class allocation to serve as motorized over-snow vehicle use suitability. The motorized over-snow vehicle suitability map is based on amendment 24 (the Winter Motorized Use amendment) to the 1986 forest plan. Based on public input, the Forest made a few changes to the areas suitable for motorized over-snow vehicle use for the forest plan; these areas have been analyzed in the final EIS.
4. The Pete Ridge area is in management area 6c and in a roaded natural recreation opportunity spectrum class for winter. Although this area is not suitable for motorized over-snow vehicle use, the area meets the roaded natural characteristics because it is close to roads and private lands and does not meet the minimum acreage criteria of 2,500 acres for semiprimitive nonmotorized class. The characteristic for access in roaded natural is “typically has some plowed roads and groomed snowmobile routes.” This does not mean that there will be plowed roads or groomed snowmobile routes everywhere in this recreation opportunity spectrum class. An additional plan component guides the management of key winter ranges for big game (GA-SM-DC-04) that relates key winter habitat for big game species and MA6c-DC-02.
5. The forest plan is specific to this geographic area with this desired condition as this is where the Forest would like to focus on providing safe winter access off of U.S. Highway 2 to winter parking opportunities. FW-DC-REC-10 states: “Trailheads are strategically located to provide safe, convenient staging to adjacent backcountry settings throughout the year.”
6. When mapping the recreation opportunity spectrum for the Salish Mountains geographic area, key winter habitat for big game species (GA-SM-DC 04) and elk habitat security (GA-SM-GDL

01) were taken into consideration. For the South Fork geographic area, the recreation opportunity spectrum mapping considered winter big game habitat (GA-SF-DC-04). Plan component GA-SF-DC-05 addresses non-native fish populations and fishing for bull trout and westslope cutthroat trout.

7. The Forest did not elect to revise the amendment 24 decision in its entirety or to revise suitability for motorized over-snow vehicle use for the entire Forest because monitoring of use in these areas does not indicate a need for change at this time.

8. The alternative B modified motorized over-snow vehicle map shows the Sullivan Creek area as not suitable for motorized over-snow vehicle use.

9. The summer recreation opportunity spectrum map allocates the Sunset Ridge area to semiprimitive nonmotorized; for the winter recreation opportunity spectrum, the allocation is semiprimitive motorized.

10. Alternative B modified includes a motorized over-snow vehicle suitability map (figure B-11). The final EIS analyzed the effects of the motorized over-snow vehicles suitability map on wildlife as well as recreation. Alternative B modified made a few changes to amendment 24 in the motorized over-snow vehicle suitability in response to the Whitefish Range Partnership agreement and public comments. The Forest agreed there was an error with the original mapping of amendment 24 in regards to the separate parcels of NFS land in the North Fork valley bottom that are bordered by private land. This error has been fixed in the motorized over-snow suitability vehicle map for alternative B modified to reflect these areas are suitable for motorized over-snow vehicle use.

Recreation—Shooting Ranges

Comment (letter number 3025)

The Forest should reopen shooting ranges, with local assistance with policing the areas and trash removal.

Response

The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Reopening a shooting range is a site-specific decision.

Recreation—Ski Areas

Comment (letter numbers 219, 311, 2940, 3006)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should restrict motorized over-snow vehicle use adjacent to the Whitefish Mountain Resort because of the loud exhaust and people coming onto runs.

2. The Forest should preserve easily accessible backcountry ski spots (U.S. Highway 2, roughly between Marias Pass on the east and West Glacier on the west) by prohibiting motorized over-snow vehicles in that area.

3. The Forest should have plan components for snow bikes that prohibit their use in first-rate backcountry ski terrain immediately adjacent to U.S. Highway 2 between Marias Pass and West Glacier and should also analyze the impacts of this type of vehicle in the final EIS as these motorized over-snow vehicles cover steep terrain quickly and present a danger when used in avalanche terrain. The Forest should restrict their use (and all over-snow vehicles) in Skiumah Creek, Cascade Creek, Rescue Creek, Wahoo Creek, Cascadilla Creek, Tunnel Creek, Paola Creek, and Paola Ridge, and the bottom flanks of Running Rabbit, Snowslip, and Elk Mountains north of U.S. Highway 2 and south of the Burlington Northern Santa Fe rail line.

4. The Forest should explain why GA-SM-DC-02 was removed and what has replaced it and whether FW-STD-REC-04 under alternative C would require Whitefish Mountain Resort to put in place similar measures.

Response

1. Areas suitable for motorized over snow use are adjacent to the Whitefish Mountain Resort. The decisionmaker carefully considered areas suitable and not suitable for motorized over-snow vehicle use to determine the mix of land and resource uses that would best meet public needs. The areas suitable or not suitable for motorized over-snow vehicle use in this decision are an appropriate allocation for the Forest in consideration of the other resources and public comments.

2, 3. Outside of the designated wilderness, these areas are generally suitable for motorized snow bikes (and snowmobiles) adjacent to U.S. Highway 2 between Marias Pass and West Glacier. There are a few management area 5a areas in this large area that is not suitable for motorized over-snow vehicle use; management areas 1a and 1b are also not suitable for motorized over-snow vehicle use. Refer to the motorized over-snow vehicle suitability map for specific areas (figure B-11). The final EIS does not analyze impacts on steep terrain or use in avalanche terrain of either motorized vehicles or backcountry skiers. The decisionmaker carefully considered areas suitable and not suitable for motorized over-snow vehicle use to determine the mix of land and resource uses that would best meet public needs. The areas identified as suitable or not suitable to motorized over-snow vehicle use in this decision are an appropriate choice for the Forest in consideration of the other resources and public comments.

4. In the forest plan, GA-SM-DC-02 is replaced with the following desired condition (GA-SM-MA7-Big Mtn-DC-04), which is found in the Salish Mountains geographic areas section: “Year-round recreational opportunities in an alpine setting exist at the Whitefish Mountain Resort on Big Mountain. Winter recreation opportunities occur in all portions of the Whitefish Mountain Resort permit area. During the grizzly bear non-denning season, developed recreation opportunities are provided on the south-facing slope in the Whitefish Mountain Resort permit area. The portion of the upper Hellroaring watershed below Taylor Creek Road (NFS Road 9790) provides higher levels of grizzly bear habitat security.”

Recreation—Standards

Comment (letter numbers 290, 2574, 2816, 2839, 2876, 2940, 3006, 3061)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should change recreation guideline 05 (alternatives B and C) to just alternative B and add that late-season snowmobiling would be not be permitted to make it consistent with the

alternative C recommended wilderness plan component that mechanized transport and motorized travel/uses are not suitable in recommended wilderness areas.

2. The Forest should remove standard 01 that limits the amount/capacity of overnight developed sites because recreation use will continue to increase, and if there are not enough developed campsites, people will camp in dispersed sites.

3. The Forest should remove/edit FW-GDL-REC-05 because if the 1 percent increase is acceptable under alternative D, it should be acceptable under all alternatives, and it is subject to site-specific analysis. The scientific information on lynx habitat and habitat use is imperfect, so allowing some flexibility makes sense.

4. The Forest should remove or edit FW-GDL-REC-07 and 08 because these may be duplicative with other riparian management zone plan components.

5. The Forest should have plan components that restrict what type of use is allowed at new trailheads where parking is limited, and signage and enforcement need to be included as part of any proposed trailhead development. Otherwise, trailheads need to be included in the limit of one development per ten years (FW-STD-REC-01).

6. The Forest should add paddling and floating to the list of recreation activities in DC-09 and add a new desired condition to the forest plan that states: Rivers and streams continue to provide exceptional nonmotorized boating, fishing, and swimming opportunities featuring excellent water quality and quantity, river corridors of intact native forest, scenic views, and opportunities to observe native biodiversity.

7. The Forest should add a new desired condition that states: A variety of motorized and nonmotorized trails are available and are designed to meet current demand, and are also designed to accommodate reasonably anticipated future increases in demand. The Flathead National Forest should also add a forestwide desired condition that accommodates the existing desire for a greater number of trails, as well as to accommodate expected increases in the future.

8. The Forest should consider the projected increase in nonmotorized visitor use on the Forest in the final EIS.

Response

1, 3. The new guideline in the forest plan (FW-GDL-REC-03) now reads: “To provide ecological conditions to support Canada lynx on NFS lands at a forestwide scale, there should be no net increase in miles of designated routes for motorized over-snow vehicle use, groomed routes, or areas where motorized over-snow vehicle use is identified as suitable. This guideline does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings, or to access regulated by guideline HU G12 (see appendix A).

2. This standard is implementing the draft NCDE Grizzly Bear Conservation Strategy (USFWS, 2013) and remains a standard in the forest plan.

4. These guidelines have been edited and do not duplicate riparian management zone requirements. FW-GDL-REC-07 and 08 from the draft forest plan are now FW-GDL-REC-06 in the forest plan: “To protect fishery resources and riparian-associated plant and animal species, new developed recreation sites should not be located within the inner riparian management zone except when they are related to health and safety or water, such as boat ramps and fish platforms.

Structures should be developed with a Forest aquatics specialist so that fisheries and riparian-associated plant and animal species are protected.”

5. Trailheads that are designed and managed for overnight use are counted as a developed recreation site and are constrained by standard FW-STD-REC-01, which limits the number of new developed recreation sites per bear management unit per decade.

6. The forest plan has the following plan component (FW-DC-REC-09): “Opportunities for sustainable recreation are available for a wide variety of users and are offered across the four seasons of use.”

7. The forest plan has the following desired conditions for trails (FW-DC-IFS-09 and 11): “Forest system trails are sustainably designed and managed to provide a variety of high-quality motorized and nonmotorized summer and winter public access that connects people to nature”; “Trails are maintained in accordance with trail management objectives direction; and a sustainable trail system exists that meets current and anticipated demands while protecting natural and cultural resources.”

8. The final EIS takes into account projected increases in nonmotorized and motorized uses on the Forest.

Recreation—Sustainable, Forest Plan Components

Comment (letter numbers 59, 2839, 2904)

The Forest should have more specific plan components that achieve the desired conditions for sustainable recreation as there is little in the plan that specifically describes what steps the Forest Service will take to achieve these desired conditions. Desired conditions must be supported with other required plan components, including specific standards and guidelines, and must have measurable objectives that link plan components to monitoring. Plan components should be integrated with management actions for other multiple uses.

The Forest should consult with stakeholders who have a particular interest in the area that is being considered for closure and periodically review all closures to determine whether they continue to be appropriate.

Response

The definition of sustainable recreation and the associated requirements that are contained in both the 2012 planning rule and implementing directives establish that the recreation opportunity spectrum—as the framework for integrating the discrete components (access, infrastructure, and scenic character) of recreation settings and opportunities and desired recreation opportunity spectrum settings—once it is integrated with other resource values, is the forest plan’s spatial expression of sustainable recreation.

Alternative B modified uses the recreation opportunity spectrum framework to integrate other resource values and displays the desired recreation opportunity spectrum as a desired condition plan component that is displayed spatially in figures B-16 and B-17. Plan components that address sustainable recreation are FW-DC-SREC-01, FW-DC-WREC-01, FW-DC-REC-09, and FW-DC-REC-12 through 15. There are monitoring requirements for sustainable recreation; see monitoring items MON-REC-01 through 04.

The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Consultation with stakeholders who have a particular interest in areas being considered for closure and periodically reviewing all closures to determine whether they continue to be appropriate are tied to a site-specific activity.

Recreation—Sustainable, General

Comment (letter numbers 52, 59, 2805, 2904)

The Forest should better integrate sustainable recreation management into overall forest management for the forest plan, particularly dispersed recreation.

The Forest should have a clear statement of the need for recreation as an important and sustainable use of the national interest lands, and it should articulate more prominently that recreation is a management priority within the alternatives presented. The Forest should integrate recreation with other resources.

Response

Sustainable recreation is integrated into the forest plan through the use of the recreation opportunity spectrum and the integration of plan components with other resources such as wildlife and aquatics.

The forest plan has numerous plan components for recreation settings, opportunities, access, and scenic character that are forestwide, management area-wide, and geographic area-wide.

A number of plan components address dispersed recreation: FW-DC-REC-12, FW-OBJ-REC-01, FW-STD-REC-01, and GA-HH-MA7-Reservoir-DC-01, 02, and 04. In addition, dispersed recreation is discussed in the section Distinctive Roles and Contributions of the Forest and in the Focused Recreation Area (MA-7) descriptions.

Alternative B modified also includes a focused recreation management area (management area 7) that covers about 61,000 acres of the Forest and serves to connect communities and users to the Forest in a more frontcountry setting.

Recreation—Trail Maintenance Funding

Comment (letter numbers 51, 307, 330)

The Forest should disclose and evaluate in the final EIS the annual amount spent by the Flathead National Forest on the maintenance and construction of nonmotorized trails during the past five years compared to the annual amount spent on maintenance and construction of motorized trails during the past five years.

Response

The Forest does not feel that the money spent on maintenance and construction of motorized trail versus maintenance and construction of nonmotorized trail maintenance is a significant issue that needs to be displayed in the final EIS. Ten percent of the Forest's system trails are summer

wheeled motorized use. Maintenance on 10 percent of the trail system would logically be lower than maintenance on 90 percent of the nonmotorized trails on the Forest.

The breakdown of how many trails are motorized on the Forest and how many trails are nonmotorized on the Forest can be found in the final EIS, section 3.10, subsections “Access” and “Trails.”

The forest plan does not make funding decisions for the Forest.

Recreation—Trail Maintenance Partnerships

Comment (letter numbers 71, 80, 92, 99, 126, 160, 192, 194, 203, 208, 211, 222, 231, 291, 310, 317, 322, 329, 330, 2578, 2585, 2592, 2619, 2625 2627, 2641, 2647, 2648, 2656, 2794, 2800, 2803, 2843, 2858, 2871, 2872, 2874, 2876, 2884, 2887, 2890, 2891, 2893, 2897, 2890, 2891, 2893, 2897, 2899, 2914, 2920, 2922, 2936, 2942, 2943, 2948, 3004, 3006, 3069, 3127, 3130)

The Forest should continue the emphasis in the forest plan on expanding public-private partnerships to maintain and build trails. The Forest Service should work with the off-highway vehicles community and mountain bike clubs to aid in securing funds and volunteer labor to address trail improvement needs.

The Forest should have its firefighting crews help the trail crews with early- and late-season trail clearing and maintenance.

Response

Alternative B modified includes plan components that pertain to partnership, and one is specific to trail maintenance and development, FW-DC-P&C-11, which states: “The Forest partners with local groups to develop and maintain a trail system as well as trail infrastructure (e.g., hut-to-hut system) where compatible with other resources.” The forest plan does not determine how specific activities (program of work) on the Forest, such as trail maintenance, are accomplished.

Recreation—Winter Nonmotorized Use

Comment (letter number 59)

The Forest should rephrase GA-MF-Essex Nordic-SUIT-03 to read: “The Essex Nordic Groomed Ski Area is not suitable for over-snow vehicle use except that which is required for grooming operations.” The way this plan component currently reads is confusing and burdensome.

The Forest should designate specific areas and trails that are available for motorized over-snow vehicle use within Krause Basin to ensure that there are nonmotorized winter recreation opportunities as well.

Response

The description of the Essex Nordic ski area in the forest plan discusses the recreation opportunity spectrum and why this Nordic area is in the semiprimitive motorized class in winter. This description is not a plan component; it just explains why it is mapped as a motorized setting. The relevant plan component in alternative B modified (GA-MF-MA7-EssexNordic-SUIT) includes the following suitability statement for the Essex Nordic ski area: “For suitability of motorized over-snow vehicle use, refer to the motorized over-snow vehicle suitability maps,

figures B-03.” This is the language that was included in the draft forest plan, and it did not change for the forest plan. The Nordic ski area itself is not suitable for motorized over-snow vehicle use.

Krause Basin management area 7 is identified as suitable for motorized over-snow vehicle use. See figure B-11. Nonmotorized use may still occur in this area.

Recreation—Winter Travel Planning

Comment (letter numbers 59, 2801, 2816, 2869, 2879, 2904)

The Forest should not adopt the previous decisions that fail to designate discrete open areas or rely on an “open unless designated closed” policy. The Forest Service also must ensure that previous decisions are not outdated as the winter travel decisions it enacts do not account for the increased speed, power, and other capabilities of current motorized over-snow vehicle technology, which allow motorized over-snow vehicles to travel farther and faster into the backcountry and to access remote areas that were previously inaccessible. Snow bikes, or timber bikes as they are sometimes called, are growing in use on the Flathead but did not exist when the Flathead’s current winter travel decisions were made.

The Forest should address its plans to enforce minimum snow-depth restrictions, including protocols for monitoring snow depths, communicating conditions with the public, and implementing emergency closures when snowpack falls below the relevant thresholds.

The Forest should designate what the Whitefish Range Partnership proposed for new routes and play areas for motorized winter use and identify those areas as management area 5c (motorized over-snow vehicle opportunities) to be sure that the recreation opportunity spectrum is consistent with that management.

The Forest should provide additional direction to ensure an adequate programmatic framework for subsequent implementation-level winter travel planning and to provide for sustainable recreation during the winter season, as required by the 2012 planning rule. For instance, the final plan should include more robust suitability determinations to further focus implementation-level winter travel planning. Suitability determinations should address functional suitability and operability. Steep slopes and windswept ridgelines, low-elevation areas without adequate snowpack, areas with dense tree cover, and important habitat for wintering wildlife should be found unsuitable. The final plan should include an objective that areas found unsuitable for over-snow vehicle use will be subject to appropriate closure orders within one year of plan approval.

The Forest should not carry forward the Forest’s Winter Motorized Recreation Plan Amendment 24 (USDA, 2006) that identified areas suitable and not suitable for motorized over-snow vehicle use because forest plans are programmatic in nature and do not meet National Environmental Policy Act obligations to take a hard look at the site-specific impacts of motorized route designations.

The Forest should clearly disclose in the final EIS how the winter motorized use restrictions proposed in each alternative will affect wildlife, wildlife habitat, and solitude and show how it located motorized over-snow vehicle route, trail, and area designations to minimize those impacts.

The Forest should revise plan components to comply with the agency’s substantive duty to minimize impacts from motorized over-snow vehicle use designations to wildlife, including wolverine and grizzly bear.

The Forest should consider a minimum snow depth to protect the underlying vegetative cover and soil or trail surface.

The Forest should verify that the Winter Motorized Decision (amendment 24) complied with the executive order and travel management rule minimization criteria before relying on it and must still designate areas and trails open to motorized over-snow vehicle use outside of the Whitefish Range through a winter travel planning process.

Response

The Forest did not identify all the areas that the Whitefish Range Partnership proposed for new routes and play areas as suitable for motorized over-snow vehicle use. Wildlife, including the wolverine and the grizzly bear, was considered during development of the forest plan components. Alternatives related to motorized over-snow vehicle use suitability, as well as other plan components that address motorized over-snow vehicle use and their effects on wildlife, are evaluated in sections 3.7.4, 3.7.5, and 3.7.7 of the final EIS. The recreation opportunity spectrum does not have to match directly the identified motorized over-snow vehicle use suitability because it is also considering the experience a user would have in the areas. See also the comments and responses under Recreation—Motorized Over-Snow Vehicles, Forest Plan Components and Recreation—Motorized Over-Snow Vehicles, General. The forest plan does not include an objective to do a closure order on areas that are proposed to be unsuitable for motorized over-snow vehicle use within one year as a closure order must have a site-specific analysis completed for it and the forest plan does not specifically state any time frames for the Forest to complete the environmental analysis.

The final EIS and draft record of decision for amendment 24 discuss compliance with the travel management rule (36 CFR Parts 212, 251, 261, and 295) and how the amendment 24 motorized over-snow vehicle use decision minimizes effects on other resources. See the draft record of decision for discussion of meeting executive orders 11989 and 11644 (minimization criteria).

Safety

Safety—Public Safety

Comment (letter numbers 51, 56, 91, 94, 95, 247, 256, 3016, 3076, 3085, 3257)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should disperse motorized use over large areas instead of forcing motorized use onto a small amount of areas or trails; this should be addressed in the final EIS.
2. The Forest should move wilderness boundaries back from the Swan Valley to for safety reasons related to firefighting and the need to be able to rescue people in the wilderness or backcountry.
3. The Forest should prioritize public safety over the management of wilderness and wildlife to protect human life. The existing Forest Service roads and the previously unmapped Plum Creek roads (acquired by the Forest through the Montana Legacy Project) serve as a lifeline for emergency services and firefighting.

Response

1. The responsible official considered all points of view and the desire for an appropriate mix of uses for the Flathead in making his decision. The preferred alternative identified in the final EIS is alternative B modified, which would provide about 1,427 miles of road and 226 miles of trail open to public motorized use across the Forest. Wheeled motorized use is restricted to designated trails, roads, and areas. Motorized over-snow vehicle use is also restricted to designated routes, trails, and areas, with areas generally quite large and offering the opportunity to travel cross-country, depending on terrain and vegetation. Current motorized use on the Forest is displayed through the motor vehicle use map and the over-snow vehicle use map. See B-03 for the motorized over-snow vehicle use suitability map.

2. The boundary of the Swan Front recommended wilderness area was changed in the forest plan to reflect concerns of local constituents. The boundary now matches the existing inventoried roadless area. In management areas 6b and 6c, vegetation management activities (including timber harvest, thinning, and prescribed fire) play a dominant role in affecting the composition, structure, and pattern of vegetation and may occur in the wildland-urban interface around the local community of Condon. The Swan Front recommended wilderness area in the 1986 forest plan was 44,815 acres; the Swan Front recommended wilderness area in the forest plan is 42,534 acres, a decrease of 2,281 acres.

3. The management of national forest system lands must take into consideration many factors, including wildlife management and wilderness. In many emergency situation, a helicopter is used to transport emergency personnel to backcountry areas of the Forest (including wilderness). In fire suppression, closed roads may be used to facilitate suppression activities.

Safety—Recreation, Overlapping Uses

Comment (letter numbers 16, 3111)

The Forest should segregate user groups such as mountain bikes and motorized uses that constitute a serious safety hazard for equestrians, hikers, and wildlife.

Response

The Forest does not generally have single-use trails (trails in the Jewel Basin Hiking Area designated for hiking only are the exception). There are about 2,220 miles of NFS trails on the Forest, and about 1,107 miles of these trails are located outside of designated wilderness areas. There are 2,053 miles of trails that allow hiking; 2,012 miles that allow pack and saddle; 806 miles that allow mechanized transport (e.g., mountain biking); and 226 miles of motorized wheeled trails on the Forest. These are shown on the motorized vehicle use maps that are free to visitors. Trails can have multiple types of allowable uses on them.

Alternative B modified would reduce the amount of trails that allow mechanized transport by 96 miles (after site-specific analysis is completed) due to recommended wilderness allocation. This means that 710 miles of trails allow mechanized transport (bicycles) where hiking and stock use may occur (32 percent of trail system). In addition, 226 miles of trails allow wheeled motorized use where hiking, pack and saddle, mechanized transport (bicycle), and stock use may also occur (10 percent of the trail system).

The number of reported conflicts between bicycle users and motorized users with hikers and/or pack and saddle is very low on the Forest.

Socioeconomics

Socioeconomics—Cost-Benefit Analysis

Comment (letter number 2911)

The Forest should complete a cost/benefit analysis for all recreational activity on the Forest's lands to identify the true costs of such use and the externalities from motorized recreation.

Response

The Forest is not required to conduct a full cost/benefit analysis of ecosystem services (i.e., goods and services provided by forest ecosystems) and multiple uses. Currently, the Forest Service is directed to address ecosystem services such as those effected by the externalities (i.e., side effects to other parties) mentioned in the comment at a qualitative level rather than a quantitative level in its programmatic level of planning, as has been done in section 3.27.4 of the final EIS. Guidance and the procedures followed to arrive at the information provided in the final EIS are described in two planning record exhibits (Eichman, Jaworski, & Ng, n.d.; Eichman & Ng, 2017). Key ecosystem services addressed in section 3.27.4 include scenery, water quality, clean air, carbon sequestration and climate regulation, flood control, outdoor recreation, forest products, grazing, and fish and wildlife. Additional benefits to people are also addressed qualitatively in this section, including jobs and income; Federal land payments to counties; cultural, heritage, and inspirational values; and research and education.

Socioeconomics—Ecological Values

Comment (letter numbers 152, 2771, 2869, 2894, 2904, 2984, 2989, 3205)

The Forest should consider ecological values and the importance of preserving ecosystems, particularly through wilderness designation, to local, national, and international communities and to both current and future generations. Wild places provide a full suite of benefits to the public, including contributions to economic and social sustainability through enhancing quality of life, providing recreation opportunities, and bolstering local economies.

The effects of climate change on connectivity and habitat should also be considered.

Response

The final EIS evaluates a range of alternatives. All of the alternatives provide for ecological sustainability, ecosystem integrity, and preservation of designated wilderness areas. The wilderness character of designated wilderness areas within the Forest will be protected for current and future generations under all alternatives.

The alternatives vary in their level of recommended wilderness and the final EIS analyses and discloses effects to ecological, social, and economic sustainability as a result of varying amounts of recommended wilderness. Climate change impacts to wildlife habitat and connectivity are analyzed in the wildlife effects analysis in sections 3.7.4, 3.7.5, and 3.7.6 of the final EIS. Appendix 7, Climate Change Adaptation Strategies, has been added to the final EIS in response to comments on this topic.

Alternative B modified includes 190,403 acres of recommended wilderness. The following areas are included in the selected alternative: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale.

Socioeconomics—Economic Analysis

Comment (letter numbers 38, 290, 3012, 3016, 3021)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Goals that were applied for some alternatives included maximizing timber output and present net value. These are likely biased due to the fact that other benefits from the Forest cannot be analyzed in this quantitative manner.
2. Economic analysis is skewed based on county selection in the economic area of influence. Missoula and Glacier Counties, among others, should be included due to the influence of the Flathead National Forest on their communities and economic conditions. Sanders County should not be included in the analysis area.

Response

1. As directed in Forest Service Handbook 1909.12 chapter 64 section 32, the Forest is required to calculate a projected timber sale quantity and a projected wood sale quantity when revising its forest plan. The Spectrum model was used to estimate the projected timber sale quantity for all alternatives. For alternatives A and D, the model was run with an objective function (or goal) of maximizing timber output. Using the results from the first run, alternative D was then run a second time with an objective function to move towards vegetation desired condition to arrive at the projected timber sale quantity. Alternatives B and C were run with an objective function to move towards vegetation desired conditions. No alternative was run with a goal to maximize present net value. The statement regarding present net value in the draft EIS was in error and has been corrected in the final EIS. The alternatives were run with different objective functions to meet the intent of each alternative. See pages 109 and 110 of the draft EIS. Further analysis was done for the final EIS to determine the timber volume if alternative D was run only with the objective function to move towards desired future condition. This analysis is presented in appendix 2 of the final EIS.

Guidance and the procedures followed by the Flathead National Forest in analyzing ecosystem services (i.e., goods and services provided by forest ecosystems) is provided in two documents (Eichman et al., n.d.; Eichman & Ng, 2017). Qualitative information related to ecosystem services and benefits from the Forest is provided in section 3.27.4). Other resource benefits are quantified to calculate associated jobs and income, such as recreation levels and range and mineral outputs. Additional information regarding the analysis of jobs and income effects is available in Larson (2017). Otherwise, goals established to maximize timber output and present net value are done to help develop alternatives by providing a measurable range of alternative outputs and effects, whereas goals based purely on qualitative information would not sufficiently aid in the development of a range of measurable output and effects across decision alternatives.

2. The Forest Service uses the same methodology on all national forests to select and delineate counties for economic analysis areas or areas of influence. The methodology is fully disclosed in a separate report (METI Corp., 2010). This methodology establishes the minimum statistical requirements for counties to maintain a meaningful and measurable economic relationship with a particular national forest. The minimal statistical thresholds include measurements of jobs, income, and commuting patterns for multiple forest-related industries, including recreation, as well as data for business interactions, including supporting industries. Missoula County is not included in the economic area analyzed because its economy has very little connection in terms of

jobs, income, commuting patterns and in terms of supporting industries with Flathead National Forest multiple-use contributions. Furthermore, when aggregated, county-level population and economic data for Missoula County that cannot be broken down would simply dwarf and potentially obscure the data from the more rural counties that are closer and more connected to Flathead National Forest forest-related industries.

The Flathead National Forest assessment described the rationale for the inclusion of particular counties in the economic impact analysis.

Although recreation ties suggest the inclusion of Glacier County, the extremely light commuting from Glacier County to the other affected counties led us to exclude Glacier County. Lincoln County, on the other hand, is included due to both substantial commuting across county lines and also some timber processing of Flathead NF timber products in Lincoln County. Both Sanders and Lake Counties were included because of commuting, trade and travel corridors across these counties. Even though Missoula County does process timber harvested from the Flathead NF and does contain Flathead NF land, we did not include it in the impact area because it is a Metropolitan Statistical Area, and the size of its economy would tend to mask the impacts on the other affected counties. Lewis and Clark and Powell Counties were not included due to the light commuting from these counties and only weak economic ties to the rest of the counties in the analysis area. (USDA, 2014a, p. 2).

Socioeconomics—Environmental Justice

Comment (letter numbers 153, 3076, 3079)

The analysis should consider the effects of the plan and alternatives on low-income communities, per the environmental justice mandate.

Response

All alternatives provide contributions to local economies and communities. The environmental justice mandate requires an analysis of whether or not the alternatives adversely affect the human health of environmental justice communities disproportionately (i.e., communities with a high proportion of low-income and minority populations). The environmental justice mandate does not require an evaluation of economic impacts; rather, the focus is on human health. The economic impacts of the alternatives are addressed as part of the economic analysis. The final EIS includes an environmental justice analysis, section 3.27.3, which identifies the environmental justice communities within the area of influence of the plan. All alternatives comply with laws, regulations, and policies. There is no evidence that any of the alternatives adversely impact the human health of environmental justice communities disproportionately.

Socioeconomics—General

Comment (letter numbers 51, 95, 104, 2912, 3007, 3076)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should consider mountain biking and travel- and tourism-related benefits from the Forest.

2. The Forest should work closely with local communities and consider the effects of the forest plan decision on their social, economic, and cultural heritage.
3. The Forest should consider cumulative access impacts across agencies. Access issues may adversely impact recreation and timber industry livelihoods.

Response

1. Mountain biking is considered in the EIS alternatives for the forest plan and is measured, in part, through impacts to the travel and tourism service industries, which are detailed in tables 174 and 175 of section 3.27.4. Currently, in national data sets on economic industries, outdoor recreation, including mountain biking, is not split out from other retail industries, so economic impacts related to the sale of mountain bikes and mountain biking-related equipment cannot be measured accurately at the county scale.

2. The Forest has worked closely with local communities through the public involvement process. The social, economic, and cultural heritage of the analysis area is described in the final EIS in section 3.27. Most accessible data on economic conditions are available at the county level, and for social conditions some data is available at the subcounty level, such as census tracts. Small, individual communities are not always framed appropriately by these national industry data sets and census statistics, but very few other reliable data sets are available for analyzing conditions across large landscapes.

Social and economic effects were considered in making the decision. A range of alternatives was developed to address the issues. The decisionmaker carefully considered a range of management area allocations and plan direction to determine the mix of land and resource uses that would best meet public needs. The plan direction and management area allocation in the preferred alternative is the appropriate choice for the Flathead National Forest in consideration of alternative analyses and public comments.

3. Most geographically specific travel- and recreation-related access decisions will remain subject to project-level planning. Similarly, cumulative access impacts across multiple agencies would best be analyzed at the project level, where other agencies make spatially explicit access decisions. The areas being recommended for wilderness do not currently have significant mechanized transport use in them, and there is currently no motorized travel allowed in the recommended wilderness areas, so these designations would have very little impact in terms of changes in access.

Socioeconomics—Jobs, Income, and Industry

Comment (letter numbers 57, 58, 95, 256, 2649, 2998, 3076, 3122, 3260)

Traditional jobs contributed by the Forest Service, related to forest management and the harvesting of timber, should be sustained or increased under the Flathead's forest plan.

The Forest should note that wilderness designation and old growth can also provide jobs.

Response

The forest plan recognizes the importance of wood products and timber harvest to job creation, reducing fire hazard, and improving forest health. See the timber desired conditions in the forest plan (FW-DC-TIMB 01 through 07).

The Forest completed an analysis in the final EIS, section 3.27.4, to estimate the potential number of jobs sustained by timber harvest in response to desired conditions and management requirements. The results are outlined in the draft EIS in tables 174 and 175. Changes in private employment were estimated based on the projected timber sale quantity and the projected wood sale quantity, and these showed some variation across the alternatives. Regardless of the alternative selected, sale of stumpage will continue to contribute to the viability of the forest products infrastructure. Section 3.27.4 and tables 178 and 179 of the final EIS highlight the importance of forest outputs on local economies and communities within the analysis area.

The selected alternative reflects the desire for a timber harvest level that provides local jobs and income and generates products for local mills and other forest product businesses in order to improve forest health while also protecting wildlife and other resource values.

Socioeconomics—Local Communities and Tourism

Comment (letter numbers 16, 37, 42, 51, 72, 150, 206, 318, 2602, 2803, 2824, 2830, 2871, 2876, 2902, 2936, 3053, 3068, 3078, 3080, 3116)

Mechanized and motorized uses are important to the local economy and tourism; the Forest should provide more opportunities for these uses.

Wilderness contributes the most benefit to local economies; more acres should be allocated to recommended wilderness.

Response

The final EIS acknowledges that mechanized recreation (mountain biking) and motorized and nonmotorized recreation are important activities to many users of the Flathead National Forest. Recreation-related employment is in part represented by the travel and tourism industry, which is documented in table 73 and figure 16 of the draft EIS and updated in tables 174 and 175 in section 3.27.4 of the final EIS. Approximately 20 percent of the employment in the Forest's greater local economy (a four-county area) is in travel- and tourism-related services.

The alternatives provide for a variety of recreation opportunities, with some alternatives providing less and others more opportunities for mechanized and motorized use. See section 3.10.3 in the final EIS for disclosure of these effects. Alternative D presents the most opportunities for mechanized and motorized use and alternative C the least. The decisionmaker carefully considered a range of management area allocations and recreation opportunity spectrum classes to determine the mix of land and resource uses that would best meet public needs. The management area allocation and resultant mechanized, motorized, and nonmotorized recreation opportunities in the preferred alternative are an appropriate reflection of multiple uses for the Flathead National Forest in consideration of the alternative analyses and public comments.

The alternatives also provide for a range of acres allocated to recommended wilderness. See section 3.15.3 in the EIS for a disclosure of these different allocations and their effects. Alternative C presents the most recommended wilderness and Alternative D the least. The decisionmaker carefully considered a range of management area allocations to determine the mix of land and resource uses that would best meet public needs. The draft record of decision identifies the recommended wilderness acreage, which is an appropriate allocation for the Flathead National Forest in consideration of analyses and public comments.

Socioeconomics—Plan Analysis

Comment (letter numbers 38, 51, 2860, 2880, 3085)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. There should be direction in the forest plan for managing the Montana Legacy Project lands in the Swan Valley to benefit the people and natural resources of the Swan Valley.
2. Missoula County should be included in the social and economic analysis.
3. The draft EIS fails to consider the economic impacts from motorized recreation.
4. The Forest should assign and report measures of quantifiable ecosystem services and feature them as prominently as vegetation and timber.
5. The Forest needs to recognize the importance of special-use permits and consider objectives for commercial recreation service provisions.

Response

1. The Forest recognizes the importance of the Montana Legacy Project lands in the Swan Valley. These lands were included in the timber suitability analysis and calculation of the projected timber sale quantity. The Forest also recognizes the need to manage these lands somewhat differently than the rest of the Forest in order to blend vegetation patterns with the surrounding forest and to decommission some roads (see GA-SV-DC 06 and GA-SV-OBJ 04). The vegetation management intensity of these lands varies by alternative.
2. See response 2 under Socioeconomics—Economic Analysis.
3. Motorized recreation is considered in the final EIS alternatives for the forest plan and is measured, in part, through impacts to the travel and tourism service industries, which are detailed in tables 174 and 175 of section 3.27.4. Currently, in national data sets on economic industries, motorized recreation is not split out from other retail industries or activities, so economic impacts related to the sale of motorized recreation vehicles or related equipment cannot be accurately measured across alternatives.
4. Measuring ecosystem services is not a requirement under the 2012 planning rule. See the comments and responses under Socioeconomics—Economic Analysis. National forests do have 2012 planning guidance to identify key ecosystem services, their potential risks and stressors, and linkages (where possible) between the production of these goods and services, forest resource management decisions, and contributions to economic and social sustainability. The Flathead assessment (USDA, 2014a) and final EIS (section 3.27.4) describe the key ecosystem services that were identified by the Forest as related to planning decisions and important to a large number of Forest beneficiaries. The key services identified included water quality and quantity, clean air and particulate matter, scenic quality and haze, inspiration and spiritual values and solitude, cultural and heritage values, carbon sequestration and climate regulation, flood control, recreation, fish, and wildlife. The Forest linked each of these services to their economic and social contributions in table 166 of section 3.27.1 of the final EIS, and monitoring indicators were identified to allow managers to monitor the benefits going forward. In the effects analysis section, 3.27.4, each key ecosystem service was described in greater detail, identifying the links and potential risks and stressors associated with other resource areas.

5. Recreation that is created through special-use permits is included in the jobs and income analysis in section 3.27.4, tables 174 and 175 of the final EIS. The desired condition FW-DC-LSU-08 provides direction for special-use authorizations to meet Forest management and public needs consistent with the recreation opportunity spectrum. There are plan components related to special-use permits in the forest plan, although there are no objectives related specifically to special-use permits.

Socioeconomics—Quality of Life

Comment (letter numbers 10, 218, 2632)

The Forest should consider effects to the quality of life of local community members.

Response

The final EIS evaluates a range of alternatives. All of the alternatives provide opportunities for the public to access the Forest and include a range of motorized, nonmotorized, and mechanized (mountain bike) use in certain areas. Access to various areas at different times of year vary by alternative. However, all alternatives provide opportunities for the public to recreate and connect with nature. All alternatives also provide for opportunities to view wildlife, experience solitude, and enjoy rural settings.

Socioeconomics—Sustainability

Comment (letter numbers 59, 2617, 2937, 3021, 3116)

The Forest should include plan components to sustain the environment and recreation.

The Jewel Basin is a significant recreation economy area.

Ecosystem restoration was omitted from the economic analysis in the draft EIS and forest plan.

Response

A number of plan components are available in the forest plan that address a wide spectrum of ecological conditions and sustainable recreation opportunities.

The economic analysis provided in chapter 3, p. 202 of the draft EIS reviewed recreation and other important resource activities. Recreation impacts were analyzed at a forestwide level, and these included National Visitor Use Monitoring survey data for day and overnight trips for multiple recreation activities at multiple access locations. These data include winter activities in the Jewel Basin and other important recreation areas. Additional qualitative content has been added to the final EIS in section 3.27.4, however, to note the significance of recreation on the Forest.

Ecosystem restoration activities considered in the economic analysis presented on page 202 of chapter 3 of the draft EIS and in section 3.27.4, tables 178 and 179, of the final EIS are mostly performed with trust funds or appropriated funds and by Forest Service employees. As a result, tables 178 and 179 highlight these impacts, not in the row entitled “Ecosystem Restoration” (which was mistakenly included in the draft EIS and has been removed in the final EIS) but rather in the “Forest Service Expenditures” row of each table. Although these jobs and salaries have impacts on local economies, they are internally managed based on appropriated budgets within the Forest Service. The budget remains constant for all alternatives; it does not change between

alternatives. In addition, ecosystem restoration work performed under commercial timber harvest contracts are summarized in the same row (“Forest Service Expenditures”). Labor income and sustained jobs provided by timber resources range between an estimated average of 12.5 and 16 million dollars and 338 and 430 jobs per year. Measuring these same impacts for contracted ecosystem restoration activities can be done more accurately at the project level because specific funding is identified for such services.

Socioeconomics—Sustainable Logging Operations

Comment (letter numbers 159, 325, 2622)

Logging and timber sales may not be economically feasible, now or in the future.

Response

Timber sales offered by the Forest Service that are valued over \$100,000 are analyzed for financial and economic feasibility before they are brought to market. A sale must be able to generate enough revenue to cover capital improvements to the project area as well as perform the required restoration work. If surplus funds are generated from a timber sale, additional restoration work may be completed. If a timber sale is not able to pay for the required site work, or if the market demand is not likely to be strong enough for competitive bidding, the timber sale project design must be altered in the planning stages. As an agency, the scope of Forest Service public programs is much broader than managing timber and providing forest products. Timber sales are not expected to pay for the entirety of the Forest Service budget, but they do contribute economically and socially to rural communities and help accomplish the vegetation management objectives of the agency.

Logging would be made less economically productive if the Forest Service did not offer timber sales on a regular basis. Logging businesses require significant bonding and equipment loans to operate. These types of businesses cannot remain solvent without steady projects and contract income. Discontinuing Forest Service timber sales would have an immediate long-term impact on the viability of logging businesses and the cost of their services.

Soils

Soils—Forest Plan Components

Comment (letter numbers 108, 2574, 3006)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. FW-DC-SOIL-02 is a very detailed desired condition and it is unlikely that the data exists on soil chemical properties or that progress could be measured. The desired conditions in the proposed action were more than sufficient, and by including more specific language the assumption is that you have the capacity to measure and monitor the soil properties mentioned at a landscape level (since this is a forest plan).

2. In FW-GDL-SOIL-03, what is considered “effective ground cover”? How is this measured and what is the baseline? This seems like a project-specific mitigation. Using an arbitrary 85 percent target in the forest plan seems to be overly restrictive.

3. In FW-GDL-SOIL-04, what is the definition of “forest floor”? The direction to maintain half thickness or 1 centimeter is unclear and seemingly arbitrary. Lack of baseline data or consideration for desired outcomes will be problematic. This is a project-specific mitigation that does not belong in the forest plan.

4. In the soils section of the forest plan, recreational trails should be included as a desired condition insofar as a trail would be considered contrary to the first desired condition—that long-term soil and site productivity be conserved. Trails impact is minimal. Similarly, “single-track” trails should be exempted from the standards and guidelines, which appear to be focused on vegetation management activities and road actions.

5. Direction in the forest plan does not address the conservation of soil or sensitivity of burned areas to salvage harvest, nor the costs associated with reclaiming burned areas damaged by machinery. The plan should have a standard that protects post-fire soil situations.

Response

1. This comment was helpful, and the Forest acknowledges the redundancy of the desired conditions. Both FW-DC-SOIL-02 and 03 relate directly to 01. The original purpose was to detail the various soil functions that contribute to soil productivity so that projects could more specifically address project effects and mitigation without simply discussing them in terms of soil disturbance terminology. For clarity and to avoid redundancy, FW-DC-SOIL-02 has been removed and the effects section in the final EIS was expanded to discuss soil function for meeting this desired condition. FW-DC-SOIL-03 has also been removed. The desire that land activities not trigger landslides or soil slumping is met with guideline FW-GDL-SOIL-02. The desired condition for soils in the forest plan (FW-DC-SOIL-01) focuses on the basic foundations of soil function and productivity.

2. The term “effective ground cover” in guideline FW-GDL-SOIL-03 refers to ground cover that resists storm runoff. Most forest leaf litter does not get entrained in runoff. The 85 percent target was derived from Water Erosion Prediction Project findings. In general, for a number of cover types, having this minimal cover does not produce measureable amounts of surface erosion. The assumption would be that bare surfaces do not have long linear slope runs prone to channeling runoff. Current best management practices reflected in the Forest’s soil and water conservation practices (USDA, 1988) address these linear risks that can form along skidding and landing surfaces.

The guideline does not require additional information since currently the Flathead National Forest collects this data as part of its soil monitoring. Baseline information would be gathered through pre-project assessment or adjacent uncut references. However, the minimum 85 percent cover is set as a condition to achieve by project completion, which can take into account the regrowth expected while finishing hazardous fuels reduction.

3. The forest floor referred to in guideline FW-GDL-SOIL-04 is the duff and leaf litter that covers the mineral soil surface. The actual amount of forest floor can be considered the balance of inputs from tree, shrub, forb, and grass litter compared to decomposition. After wildfire, much of the forest floor can be oxidized and thus reduced to a minimal amount or sometimes completely removed, leaving a charcoal residue. Over time, vegetation recolonizes and starts to rebuild the forest floor. As the forest succession proceeds, the character of the forest floor changes, forming highly decomposed duff layers with litter on the surface. This is the dynamic trait referred to in the guideline. The forest floor varies across dry and wet sites; wet cedar sites accumulate thicker

accumulations of detritus compared to drier sites. Cedar sites have a higher level of tannin in woody and leaf litter that resists decay, despite higher moisture to facilitate decomposition. In contrast, dry sites have high levels of fine leaf litter that decomposes readily, typically leaving a thin layer of forest floor.

The Forest believes that it has sufficient baseline data by referring to Page-Dumroese and Jurgensen (2006), which measured several habitats across the Rocky Mountains in a variety of successional states. This assessment found that the forest floor varied from 5 to 15 centimeters for habitats in USDA Forest Service Northern Region. Monitoring information of old cutting areas and recovering burn areas show at least 1 to 3 centimeters of forest floor. Based on this information, near complete forest cover of some type of detritus is expected except on sites that have had high-severity fire. Thus, the minimum 1 centimeter forest floor guideline is included in FW-GDL-SOIL-04 to reflect this minimum cover. The guideline would be applied as an average condition across an activity area, which is typically a timber unit.

This guideline is not project specific since the Forest believes the forest floor is an important element in meeting FW-DC-SOIL-01. Most of the project activities on the Forest involve timber and fuels reduction activities. The guideline establishes a minimum threshold to conserve the forest floor, which is a very important element.

4. Trails and roads as well as administrative sites such as campgrounds are all exempt from soil productivity standards. The Forest's primary purpose for the area dedicated to supporting this infrastructure is not growing trees but facilitating whatever other purpose the site is associated with (e.g., horse travel, biking, hiking). Soil productivity for trails can be an issue when user-created trails begin to develop (off the Forest's dedicated trail system) to the extent that erosion is exacerbated. FW-DC-IFS-07 speaks to the desire to manage trails in accordance with trail management objectives, which includes application of best management practices and other design features to minimize sediment input to waterbodies. In addition, FW-GDL-IFS-03, 05, 06 and 08 require measures for trail management that protect water quality and aquatic resources.

5. The Forest assumes that this comment is addressing fire salvage operations because of the higher sensitivity of burned soils to ground disturbance from logging equipment. The plan components give the latitude necessary to address these circumstances when harvesting in burned areas. Impacts to soils would be addressed at the site-specific level in the project analysis. Fire salvage operations typically have greater mitigation features in order to protect the soil resource. Regardless of the situation, the soil desired condition in the plan (FW-DC-SOIL-01) sets forth the expectation that management would conserve soil function and long-term productivity. Standards and guidelines give sideboards to meet this desired condition by limiting the extent and intensity of disturbance and, where necessary, by addressing currently impaired soil functions to improve long-term soil conditions. Standard FW-STD-SOIL-02 requires following best management practices and other design features when conducting land management activities to limit erosion. FW-STD-SOIL-03 addresses the restoration of temporary roads that are used to conduct management activities.

Soils—Forestwide Standards

Comment (letter number 2574)

FW-STD-SOIL-01, 02, and 03 should be guidelines rather than standards. Standard 01 has proven to be unworkable in the past; the hard-and-fast 15 percent limitation without provisions for natural or human-caused restoration has proven problematic at a project level, and the limitations

should be a guideline not a standard. The last sentence that states in part “should move toward a net improvement in soil quality” should be the focal point of the entire standard.

Response

The Forest intends to control the amount of disturbance from its actions and speed recovery where soil is impaired. Forest monitoring has demonstrated that most of the Forest’s actions stay below this conservative threshold. However, the Forest needs to treat more areas that have been disturbed by previous timber harvest (“legacy soil disturbance”). As currently written in the draft EIS, standard FW-STD-SOIL-01 implies that all projects would need restoration measures for a net benefit in soil condition. There is uncertainty in some of the standard control measures used to achieve this net benefit, whether minimizing additional disturbance by timing actions to occur during frozen and snow-covered conditions or rehabilitating old road and skidding templates. Thus, the standard has been rewritten to still require measures to improve soil recovery where the legacy soil disturbance exceeds 15 percent. However, the improvements are not constrained numerically in terms of detrimental disturbance because of the variation in site conditions and restoration opportunities.

New activities must consider rectifying lasting impacts from historic road templates. Due to the importance of this issue, the Forest has made these decommissioning requirements standards (FW-STD-SOIL-03 and 04). These standards provide the sideboards necessary to improve soil function where impaired; road templates are the most significant areas of permanent soil impairment on the Flathead National Forest.

The standards address situations where temporary roads are used to conduct timber harvest (FW-STD-SOIL-03), requiring restoration of these roads. FW-STD-SOIL-04 addresses the importance of restoring soil function when conducting road decommissioning. Appendix C of the forest plan provides possible approaches and methods to improve soil productivity in these situations. In some cases, the site conditions will not necessitate any actions. However, the site would still be assessed for soil recovery. The final EIS, section 3.2.7, also details examples of methods to address soil function.

Special Areas and Research Natural Areas

Comment (letter number 59)

The Forest should designate special areas and research natural areas as unsuitable for motorized over-snow vehicle use. Also, the many special botanical areas in the Swan Valley should be noted under the unique characteristics for the Swan Valley geographic area.

Response

Amendment 24 of the 1986 Flathead forest plan was adopted in 2006 and established areas that would be suitable for over-snow motorized vehicle use. Figure 1-43 in appendix 1 of the final EIS for the forest plan reflects this 2006 decision. For the forest plan, the over-snow motorized vehicle recreation use suitability within areas that are designated as management area 3b (special areas) or management area 4a (research natural areas) remains the same as was established in the 2006 decision, except where it may be altered due to the new management area allocations (such as under alternative C, where the increased area allocated to recommended wilderness would change to not suitable for motorized over-snow vehicle uses). Motorized over-snow vehicle use within special areas and research natural areas is a decision that is considered most appropriate to make at the project level rather than the programmatic level of the forest plan so that the specific

conditions and values associated with the areas can be site-specifically evaluated. The Forest did not feel that a broad programmatic prohibition on motorized over-snow vehicle use within special areas or research natural areas was necessary. Refer to figure B-11 in the forest plan for the areas determined to be suitable for motorized over-snow vehicle use under the draft decision.

As requested by the commenter, narrative was added to the Swan Valley geographic area description to highlight that area's abundance of wetland and fen habitats.

Species of Conservation Concern

Species of Conservation Concern—Additional Species

Comment (letter numbers 319, 2869, 2904, 2940)

The Forest Service was not inclusive enough in identifying species of conservation concern and did not adequately justify the exclusion of two federally recognized species, three species previously identified as potential species of conservation concern, and one species that may be susceptible to climate change.

Response

Federally recognized species such as lynx and wolverine (threatened and proposed threatened, respectively) cannot be identified as species of conservation concern per 36 CFR 219.9(c). However, they are addressed as at-risk species in the final EIS, and the forest plan must contribute to ecological conditions that provide for their long-term persistence.

Three species identified in the assessment as potential species of conservation concern were not identified as species of conservation concern upon more thorough evaluation by the regional forester. These are the common loon, northern bog lemming, and veery. Below are brief summaries of why these species have not been identified as species of conservation concern.

Common loon: This species appears to be secure in the plan area. There are 25 known nesting territories, which is thought to be the carrying capacity of the habitat (i.e., all suitable lakes are occupied by nesting pairs). Furthermore, the plan area's population and habitat are currently stable and are not threatened to the extent that long-term persistence would be precluded in the plan area.

Northern bog lemming: Fens and other important wetlands are relatively common and stable in the plan area. The plan area is near the edge of range for this species, but no threats, life history traits, riparian connectivity deficits, or other relevant information prompt substantial concern for long-term persistence.

Veery: Riparian hardwood habitat is inherently limited but likely stable in the plan area due to a lack of stressors. Breeding Bird Survey (BBS) data for 2005-2015 show a significant decline of the veery in Montana as a whole but not within the northern Rockies region. No life history traits or other factors indicate substantial concern for this species.

Seven additional species raised in public comments were considered or reconsidered for species of conservation concern status and found not to justify identification as species of conservation concern. These are pika and long-eared myotis (not previously considered), American peregrine falcon, bald eagle, black-backed woodpecker, bighorn sheep, and gray wolf. Below are brief summaries of why these species were not identified as species of conservation concern.

Pika: This species is secure in the plan area because it is relatively abundant, has relatively stable habitat, and faces no substantial threats in the plan area. Although climate change is a concern in some portions of this species' range, research indicates that in core habitats like the Rocky Mountains, this species is likely resilient and adaptable enough to ensure long-term persistence.

Long-eared myotis: The Forest Service was uncertain whether comments regarding the long-eared myotis were referring to the *Myotis evotis* (western long-eared myotis) or the *Myotis septentrionalis* (northern long-eared bat). Therefore, the Forest Service evaluated both species. The western long-eared myotis was not identified as a species of conservation concern because the species appears to be secure in the plan area, with no indication of population or habitat declines and no evidence that the species is particularly vulnerable to population-level stressors on or off the plan area. The northern long-eared bat was not identified because it is a federally recognized species; note also that this species does not occur in the plan area.

American peregrine falcon: This species is secure in the plan area as evidenced by increasing population, stable habitat, lack of threats, and lack of life history traits or other factors that warrant substantial concern.

Bald eagle: This species is secure in the plan area. This is evidenced by a robust, well-distributed nesting population in or within 1 mile of the plan area, a stable or increasing nesting habitat trend, a lack of threats to the population that uses the plan area, and no life history traits or other factors that warrant substantial concern.

Black-backed woodpecker: This species is secure in the plan area. This is evidenced by an increasing habitat trend, high dispersal distances, high ability to find and exploit ephemeral resources created by disturbance processes even when source populations are very low (i.e., high resilience), and a large amount of potential habitat in designated wilderness where natural processes such as wildfire and insect mortality prevail and activities such as salvage harvest do not occur.

Bighorn sheep: This species is not established or becoming established in the plan area. Only transient use has been recorded, in the Bob Marshall Wilderness by the Sun River herd. The primary threat is disease transmission, but there is no domestic sheep grazing on the Forest.

Gray wolf: This species is secure in the plan area, evidenced by well distributed and abundant packs, lack of threats to the population, and a lack of life history traits or other factors that warrant substantial concern.

Long-legged myotis: This species is secure in the plan area, with no indication of habitat declines, no evidence that the species is particularly vulnerable to population-level stressors on or off the plan area, and no indication that life history traits or other factors warrant substantial concern.

Western toad: This species is secure in the plan area. It is well distributed and shows no evidence of population decline, habitat decline, or major relevant threats in the plan area.

In response to other public comments and new evaluations of best available scientific information, four animal species previously identified as species of conservation concern are no longer identified as species of conservation concern. The species and rationale for these changes are provided below:

Fisher: This species is not currently known to occur in the plan area and may not have occurred there historically. There are no trapping records, museum records, or other reliable evidence that this species was established in the plan area prior to the release of translocated fisher near Holland Lake in 1959 and 1960. Also, there is no reliable evidence that the species is established or becoming established in the plan area today. After translocations occurred, fisher presence was verified through “in-hand” evidence (e.g., trapping records) on multiple occasions for the next 34 years. However, the last reliable observation in the plan area was a 1993 trapping record. Repeated efforts to detect fisher in the plan area through DNA and other verified, reliable evidence have failed to detect this species since monitoring began in 2008.

Townsend’s big-eared bat: The Forest Service found insufficient information to conclude substantial concern for this species. The plan area has no known maternity roosts or winter hibernacula, which are limiting factors for this bat. There is no information on population trends or abundance in the plan area, and little information on distribution. There are no known threats relevant to the population using the plan area, as potential cave habitats are likely stable and white-nose syndrome is neither known to affect the species nor is present in Montana.

Harlequin duck: This species is secure in the plan area. The Forest Service reviewed all monitoring reports applicable to the plan area and found the species to be more secure in the plan area than previously thought. The breeding population is well distributed and produces broods with high frequency. Breeding has been documented on at least nine streams in four geographic areas. In those nine streams, brood presence has been verified in nearly 70 percent of all survey years between 1990 and 2017. There is no evidence of population decline, habitat decline, or major relevant threats affecting reproductive females that use the plan area.

The complete rationale for determining species of conservation concern status of these and all other species on the Flathead National Forest is provided at <https://www.fs.usda.gov/detail/rl/landmanagement/planning/?cid=fseprd500402>, as is the identification process that lead to that rationale.

Species of Conservation Concern—Black Swift

Comment (letter number 2940)

Managing habitat largely through coarse-filter, ecosystem-focused plan components is appropriate, but plan component FW-GDL-WL SCC-04 for black swifts needs to be improved because it is too vague. The Forest should have a guideline or standard incorporating the following specific recommendations from Wiggins (2004):

- minimizing disturbance, rerouting hiking trails away from waterfalls,
- enforcing seasonal buffer zones near the base and top of nesting cliffs,
- creating suitable nest pockets behind waterfalls, and
- timing activities that nesting swifts are not accustomed to (such as loud noise that may be associated with some types of trail maintenance) so that they do not occur within 500 feet of known nesting colonies during the nesting season.

The draft EIS analysis of effects on black swifts needs to be improved. Black swifts breed in the Forest and nest behind tall waterfalls in caves or wet rock cliffs. According to the draft EIS, a primary stressor is increasing drought events due to climate change, which affects streamflow and thus waterfall habitat. Earlier snowmelt and runoff may result in waterfalls drying up before young have fledged. This requires limiting other stressors, including timber management, which can affect water runoff and flow regimes, and livestock grazing, which degrades riparian vegetation and channel structure resulting in decreased stream flows (Wiggins, 2004). The draft EIS did not analyze the effects on the black swift of continuing timber harvesting and livestock grazing on the Forest under the forest plan; it should have assessed the effects of these stressors on viability.

Response

Plan components for the black swift were refined and clarified in alternative B modified to include information from appendix C, such as items that address black swift nest site shading and disturbance (see desired condition FW-DC-WL DIV-01). Guideline FW-GDL-WL DIV-05 reduces the risk of disturbance to black swift nest sites during the nesting season. Rerouting hiking trails or seasonal buffer zones for all activities is not warranted in the plan area, based upon the best available scientific information. As noted by Wiggins (2004), the effects of human activity on black swifts has not been studied. Anecdotal evidence (e.g., long-term use, observed reproduction) at the Flathead National Forest's known colony and other colonies in Colorado suggest swifts are not negatively affected by human activity such as recreational hiking near occupied waterfalls. However, the Forest acknowledges that project-specific circumstances may arise that warrant caution, and so guideline FW-GDL-WL DIV-05 is included in the forest plan to address this potential risk. Application of this guideline would be determined on a site- and project-specific basis, using the best available scientific information.

Climate change effects on black swifts are discussed on page 282 of the draft EIS and in the black swift section of section 3.7.4 of the final EIS. Multiple plan components for aquatic ecosystems protect water quality and quantity and contribute to the quantity and quality of black swift habitat. Plan components specific to black swifts would minimize stressors other than climate change. The best available scientific information does not indicate that timber harvest or livestock grazing are key stressors for the black swift on the Forest. The known nesting colony site is in recommended wilderness under alternative B modified, which means that timber harvest or livestock grazing would not be allowable. The known nesting site is a very large waterfall, has water flow throughout the nesting season, and has no known threats. Known and potential nesting waterfalls are geologically limited on the Forest, but nesting continues to occur. Potential feeding habitat is abundant, and observations of feeding birds occur on a regular basis in suitable habitat.

Species of Conservation Concern—Clark's Nutcracker

Comment (letter numbers 58, 2574, 2940)

Focusing on whitebark pine restoration may be the appropriate mechanism for sustaining the viability of the Clark's nutcracker. Regeneration harvest is needed to help perpetuate this habitat, but most of the habitat is outside of the suitable timber base.

The Clark's nutcracker should not be a focal species because the depth of data available on its population and habitat is poor.

Response

In the final EIS, section 3.7.4, subsection “Coniferous forest habitat” on the Clark’s nutcracker discusses the benefits of whitebark pine restoration for the Clark’s nutcracker. Because whitebark pine grows at high elevations, most of the areas where this species is found are not suitable for timber production. However, the forest plan has plan components to use other means to restore whitebark pine, such as fire and/or the planting of rust-resistant trees (also see the comments and responses under Vegetation Management—Whitebark Pine).

The Forest is not sure whether one of the commenters was confusing a focal species with a species of conservation concern. The responsible official did not select the Clark’s nutcracker as a focal species (for monitoring) but did select it as a species of conservation concern due to decreasing (and limited) habitat, disruption of its mutualistic relationship with whitebark pine, and the long-term temporal horizon for habitat restoration. The spreadsheet documenting the rationale for all species considered for species of conservation concern status can be found at <https://www.fs.usda.gov/detail/r1/landmanagement/planning/?cid=fseprd500402>. The Forest has abundant information on the habitat of the Clark’s nutcracker. Modeling conducted for the Flathead National Forest indicates that the distribution (presence) of whitebark pine is below the estimated natural range of variation, both forestwide and within the cold potential vegetation type. Additional analysis of Forest Inventory and Analysis data indicates that even on those acres where whitebark pine is present, densities are exceedingly low, at less than 10 square feet basal area/acre. Most trees are seedling or sapling size, and live trees that are mature enough to produce cones for the nutcracker to feed upon are low in number and density. The forest plan would maintain the long-term persistence of the Clark’s nutcracker by restoring the historic distribution and presence of seed-producing trees, within the Forest Service’s authority and the inherent capability of land. Life history traits of the Clark’s nutcracker make this species very capable of reoccupying habitat once whitebark pine is restored (e.g., the species is wide-ranging, is not territorial, and is adapted to exploring potential habitats in search of food). Chapter 5 of the forest plan includes a monitoring item for Clark’s nutcracker habitat to see if the Forest is trending towards desired habitat conditions (MON-WL-05).

Species of Conservation Concern—Flammulated Owl

Comment (letter numbers 2574, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Clarify why well over 68 percent of the Forest is off limits to firewood cutting and timber harvest yet population numbers of the flammulated owl are still low. Salvage logging may impact the density of very large trees, affecting flammulated owl nesting habitat. The ecosystem-focused components in the forest plan may be adequate for the flammulated owl, and this species may benefit from vegetation treatments that open up dense ponderosa pine stands and reduce forest fuels (Lehmkuhl et al., 2007).

2. The flammulated owl is not a good focal species or indicator species to measure the success in managing the Forest because its population trend and status in Montana are unknown.

Response

1. As stated on page 339 of the draft EIS and in section 3.7.4 of the final EIS, subsection “Coniferous forest habitats” on the flammulated owl, flammulated owl populations are believed to be naturally low on the Forest. As discussed in final EIS, appendices 2 and 3, analysis of the natural range of variation shows the Forest’s environmental conditions have supported low

amounts of ponderosa pine/Douglas-fir forest habitat historically and currently. The natural range of variation for this forest type is estimated to be 0.5-3 percent historically, and it is estimated to occur on 0.4 percent of the Forest at present. Additionally, the structure of these forests has changed. Desired condition FW-DC-WL DIV-01 lists key habitat characteristics and desired conditions for flammulated owls. Alternative B modified has plan components designed to maintain or restore the structure of ponderosa pine/Douglas-fir forests, including the density of large and very large live trees and snags, that are incorporated into desired conditions for terrestrial ecosystems and vegetation (FW-DC-TE&V-07, 11, 12, 15, 16, and 19).

Several standards and guidelines provide for flammulated owl habitat. Standard FW-STD-TE&V-01 and guideline FW-GDL-TIMB-03 protect old growth. The guideline specifies that if timber is salvaged in areas that were verified old-growth forest prior to the fire, standing (and down) live, dying, and dead western larch, ponderosa pine, and black cottonwood trees greater than 20 inches d.b.h. should be retained. Standard FW-STD-TE&V-03 provides for flammulated owl habitat and its distribution by requiring that minimum numbers of snags and/or live snag replacement trees shall be retained in each geographic area. In summary, plan components for the warm-moist and warm-dry ponderosa pine types, old growth, and snags have incorporated the habitat needs of this species.

2. The Forest is not sure whether one commenter was confusing a focal species with a species of conservation concern. The responsible official did not select the flammulated owl as a focal species (for monitoring) but did select it as a species of conservation concern based on limited habitat that is slightly below the modeled natural range of variation and an apparently small population size based upon past monitoring; see the 2014 assessment of the Flathead National Forest (USDA, 2014a). The spreadsheet documenting the rationale for all species considered for species of conservation concern status can be found at <https://www.fs.usda.gov/detail/r1/landmanagement/planning/?cid=fseprd500402>. Chapter 5 of the forest plan includes a monitoring item for flammulated owl habitat to see whether habitat in the plan area is trending towards desired conditions (MON-WL-02).

Species of Conservation Concern—Harlequin Duck

Comment (letter numbers 2574, 2940, 3042)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should be more specific about the “measures” in guideline FW-GDL-WL SCC-04. The Forest should establish a standard for a minimum buffer distance for disturbance along harlequin duck nesting streams or incorporate the following suggested potential management approaches and possible actions as guidelines or standards: maintaining dense vegetation and/or high densities of downed logs adjacent to stream reaches with known harlequin duck nesting sites to provide cover, protection from disturbance, and protection from predators; evaluating existing roads near nesting stream reaches for decommissioning or placement into stored service; assessing proposed mineral exploration and development in watersheds around nesting stream reaches for impacts to harlequin ducks; requiring provisions for harlequin ducks and their habitat needs in minerals management plans (including leasable, locatable, and salable minerals); avoiding constructing new trails or campgrounds along breeding stream reaches; and adding desired conditions that seek to limit impacts to adults and older broods on larger rivers, given the rapid increase in boat, raft, and kayak traffic on rivers and streams. See Wiggins (2005).

2. The draft EIS should state that habitat for this species is only limited by topography. The draft EIS discussion of the effects to harlequin ducks of different timber harvest scenarios under alternatives B, C, and D should be improved.

Response

1. In alternative B modified, desired condition FW-DC-WL DIV-01 addresses many of the recommendations listed in the comments. Wiggins (2005)(2005) was considered during development of plan components. A minimum buffer distance for human disturbance was not included as a standard because the Forest knows of no scientific information indicating what the buffer width should be. The distance would vary depending upon factors such as the type of activity, whether there is dense vegetation present to provide screening or cover for hiding, etc. Under alternative B modified, forestwide guideline FW-GDL-WL DIV-05 requires the Forest to meet the purpose of the guideline, which is to reduce the risk of disturbance to harlequin ducks along active nesting stream reaches, but the means for doing so may vary depending on site-specific habitat conditions and the specific proposed activity. In addition to species-specific plan components, alternative B modified includes forestwide plan components for riparian management zones and infrastructure (including standards and guidelines) that are designed to maintain ecological conditions for harlequin ducks, including cover, protection from disturbance, and protection from predators (see, for example, FW-SUIT-RMZ-01, FW-GDL-RMZ-08, 09, 11 through 13; FW-GDL-IFS-03 through 10). Forest plan appendix C includes more details on possible strategies but also recognizes that the science guiding specific management actions may change. Measures or strategies could include project design features such as timing of timber harvest or maintaining a buffer, as well as numerous other potential strategies, based upon the best available scientific information.

Although observations indicate that boat, raft, and kayak traffic on some of the larger rivers and streams has increased in the last decade, the Forest does not have data on how much it has increased and knows of no scientific evidence that boating, rafting, or kayaking is impacting harlequin duck populations on the Forest. As stated on page 285 of the draft EIS and in the final EIS section 3.7.4, subsection “Harlequin duck,” there are somewhat uncertain or conflicting scientific findings regarding the effects of recreation disturbance and road use on harlequin ducks. The Forest is aware of no identified thresholds for levels of boating use. However, the forest plan includes a component related to the monitoring of harlequin ducks (MON-WL-01). The plan is intended to be adaptive to changing conditions and new information and can be amended or revised in the future if needed.

2. With respect to the limits to habitat for harlequin ducks, the final EIS section 3.7.4, “Harlequin duck,” explains that harlequin duck habitat is provided by clear, low-gradient, fast-moving mountain streams. In the final EIS, the Forest has added a statement acknowledging that topography contributes to these conditions. As for improving the discussion of the effects of timber harvest on harlequin ducks, the Forest has added a discussion related to potential timber harvest activities in relation to harlequin ducks in the final EIS. Additionally, plan components for riparian management zones were refined and clarified in the forest plan. FW-SUIT-RMZ-01 states that riparian management zones are not suitable for timber production. Standard FW-STD-RMZ-01 states that the width of the inner riparian management zone shall be a minimum of 150 feet on each side of a perennial stream. Harlequin ducks typically nest on log jams in streams or on the adjacent stream bank (i.e., within 150 feet of a stream). Standard FW-STD-RMZ-06 states that vegetation management shall only occur in the inner riparian management zone to restore or enhance aquatic and riparian-associated resources, thus protecting harlequin duck habitat.

Guideline FW-GDL-WL DIV-05 reduces the risk of nest site disturbance for a 16-week time period from mid-April to mid-August. This guideline would apply to activities such as timber harvest, road building, and mineral exploration or development on National Forest System lands.

Species of Conservation Concern—Identification Process

Comment (letter numbers 2574, 2805, 2940)

The Forest Service did not identify enough species of conservation concern due to improperly limiting species of conservation concern evaluations to the plan area (e.g., evaluating population trend, habitat trend, and relevant threats at the scale of the plan area instead of a larger area).

The Forest Service identified too many species of conservation concern because some species do not currently occur in the plan area, there is too little information about them to conclude substantial concern, or they are threatened by circumstances beyond the Forest Service's control. The fisher was inappropriately identified as a species of conservation concern.

Response

Commenters expressed opposing viewpoints on whether the regional forester identified too few or too many species of conservation concern. These stemmed from disagreement with and/or lack of clarity about the process used to identify species of conservation concern.

The process used for identifying plant and animal species of conservation concern for the Northern Region is at <http://bit.ly/NorthernRegion-SCC>. The process documents listed for the Flathead National Forest include the steps taken to identify species of conservation concern and clarify how the directives on species of conservation concern identification (Forest Service Handbook 1909.12, chap. 10, secs. 12.52 through 12.53) were interpreted and applied.

The 2012 planning rule defines a species of conservation concern as “a species, other than a federally recognized threatened, endangered, proposed or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area” (36 CFR 219.9(c)).

The rule's definition explicitly states that substantial concern for persistence applies to the plan area (the plan area is defined in the 2012 planning rule as National Forest System lands on a national forest). Species of conservation concern may not be identified based on concern at geographic scales greater than the plan area (e.g., due to broader population or habitat declines). The directives use those broader-scale concerns as a way to help the regional forester determine, at the beginning of the identification process, which species should be considered. Such consideration can help identify limiting factors that may be applicable in the plan area. Hence, Forest Service Handbook 1909.12 chapter 10, section 12.52d specifies categories of species (such as NatureServe global and state ranks) that should or must be considered for species of conservation concern status, but such consideration in no way implies that these species should or must be identified as species of conservation concern in the absence of substantial concern about its capability to persist in the plan area.

Neither the definition of species of conservation concern at 36 CFR 219.9(c) nor the directives (Forest Service Handbook 1909.12, chap. 10, sections 12.52 through 12.53) indicate that a species must be affected by agency management to be identified as a species of conservation concern. In fact, the 2012 planning rule at 219.9(b)(2) acknowledges that it may be beyond Forest

Service authority or not within the inherent capability of the plan area to maintain or restore the ecological conditions to maintain a viable population of a species of conservation concern in the plan area. Species of conservation concern are identified when best available scientific information indicates substantial concern for long-term persistence in the plan area, irrespective of whether the species is threatened by circumstances beyond the Forest Service's control. Concern is about the ability of the species to persist in the plan area, but the things that cause concern (e.g., threats) do not need to occur only in the plan area or, in fact, within the plan area at all.

The Forest Service planning directives in Forest Service Handbook 1909.12 chapter 10 section 12.52c state that if there is insufficient scientific information available to conclude a substantial concern about a species' capability to persist in the plan area over the long term, that species cannot be identified as a species of conservation concern. The rationale documentation at <https://www.fs.usda.gov/detail/r1/landmanagement/planning/?cid=fseprd500402> discloses those species for which the Forest did not find sufficient information to determine whether there was substantial concern for their long-term persistence in the plan area.

The Forest also acknowledges that information regarding habitat needs, population dynamics, threats, or other evaluation factors is scant for some species that are identified as species of conservation concern. The Forest's rationale (see <https://www.fs.usda.gov/detail/r1/landmanagement/planning/?cid=fseprd500402>) discloses these gaps and provides the logic for why the Forest believes there is enough information to conclude substantial concern. In all cases, there is a combination of key information that, when considered collectively, demonstrates substantial concern, despite gaps in other knowledge. That is, the Forest believes the weight of evidence indicates substantial concern when considering what is known about the habitat, threats, abundance, geographic distribution, reproductive potential, dispersal capabilities, and other relevant demographic and life history characteristics that could influence a species' long-term persistence in the plan area.

The planning rule and subsequent planning directives do not require the Forest Service to use only information originating from the plan area to determine whether there is substantial concern for the long-term persistence of a species. Instead, the Forest Service must use the best available scientific information, which is scientific information that is deemed to be accurate, reliable, and relevant to the issues being considered. Data collected outside of the plan area, such as in different states or habitats, may be still be relevant to the plan area and provide insight to conditions within the plan area. The responsible official must have a reasonable basis for relying on that scientific information as the best available (Forest Service Handbook 1909.12 zero code sec. 07.12). However, due to the commenter's concern regarding too little information to determine substantial concern for the harlequin duck, the Forest evaluated more closely the monitoring data specific to the plan area. It was determined that the species is more secure in the plan area than previously thought, and it is no longer identified as a species of conservation concern.

The comment that the fisher should not be identified as a species of conservation concern if there is no specific evidence the species occurs on the Forest caused the Forest to reevaluate what is known about fisher in the plan area and to re-examine the process for determining "known to occur in the plan area." This, in turn, resulted in the conclusion that fisher are not currently known to occur in the plan area and that they may not be native to the area, either. Therefore, the Forest no longer identifies fisher as a species of conservation concern.

In the reevaluation, the Forest found no indication that fisher had occupied the plan area before individuals were deliberately translocated onto the Forest in 1959 and 1960 (M. K. Schwartz, 2007; Ray S. Vinkey, 2003; R. S. Vinkey et al., 2006; Weckwerth & Wright, 1968). That is, no records archived in the Montana Natural Heritage Program or Forest Service wildlife observation databases, or published in the literature, suggest that fisher were present in the plan area prior to 1959. The Forest did not look for such pretranslocation data during the assessment or evaluation to identify the list for the draft EIS. The concept that fisher may not have occurred in the plan area prior to the translocations is supported by Vinkey et al. (2006), who found no evidence that fisher in northwestern Montana (which includes the plan area) had genetic material unique to the lineage of fisher native to the U.S. northern Rocky Mountains. Instead, they found that fisher in northwestern Montana shared genomic haplotypes with samples obtained from fisher in the Midwest and British Columbia, which were the source population areas for the northwestern Montana translocation efforts.

The Forest also found no reliable evidence since 1993 of fisher occurring in the plan area. After the translocations to the plan area and adjacent areas, numerous fisher were verified in the plan area up until 1993, which is the date of the most recent recreational trapping record (Giddings, 2012). During the interim between the first translocation in 1959 until the last trapping record in 1993, fisher were known to occur in the plan area, as evidenced by numerous trapping records (Giddings, 2012).

Beginning in 2006, fisher and other mesocarnivores have been targeted in purposeful surveys of the plan area utilizing multiple methods, including DNA sampling, yet no fisher have been detected (Curry et al., 2016; Pilgrim, 2007-2012; Pilgrim & Schwartz, 2015; SWCC, 2014, 2015).

The Forest's new evaluation prompted a more clear differentiation between species "known to occur in the plan area" and those that only occurred historically. To do this, the Forest adopted NatureServe's approach for determining historic occurrences; that is, if an animal species has not been reconfirmed for 20 or more years, particularly when field surveys have been conducted, it is considered historical. The fisher fits this category.

If new scientific information is received to indicate that a species (including the fisher) should be removed or added as a species of conservation concern, the regional forester will evaluate the information and adjust the list using the guidance at Forest Service Handbook 1909.12 chapter 10 section 12.52.

Species of Conservation Concern—Plant Species Protection

Comment (letter number 3009)

The forest plan should include direction that addresses the protection of plant species of conservation concern from noxious weed infestations, including a minimum-sized buffer zone around plant species of conservation concern populations.

Response

In the Non-Native Invasive Plants/Noxious Weeds section of the plan, areas around known populations of plant species of conservation concern have been added to the list of priority areas where the desired condition for invasive plants is to be at low abundance or non-existent (FW-DC-NNIP-01). Focus on these high-priority areas has also been added to the objective for treatment acres (FW-OBJ-NNIP-01). The plan also includes guidelines that restrict the location of

temporary fire facilities and the use of heavy, ground-based equipment in areas where plant species of conservation concern are found (FW-GDL-PLANT DIV-01 and 02). These measures will help protect against noxious weed establishment and spread in and near populations of species of conservation concern. In addition, appendix C of the forest plan includes a strategy that addresses the identification of plant species of conservation concern at the project level of planning, and, if any are found, incorporates protection measures if necessary to ensure that desired habitat conditions for these species are maintained. These measures may include buffers around known plant populations where ground disturbance is not allowed.

Species of Conservation Concern—Townsend's Big-Eared Bat

Comment (letter numbers 2574, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should ensure no net loss of roosting habitat in order to maintain the viability of the Townsend's big-eared bat.
2. The Forest should restore and maintain connectivity between habitat types used by Townsend's big-eared bats.
3. The Forest should specify the use of bat-friendly gates to make caves accessible to bats while protecting the cave resource.
4. The Forest should change guideline FW-GDL-WL SCC-01 to be three separate standards that read: "If mines, caves, or old buildings are closed to reduce safety hazards or vandalism, bat-friendly closures must be installed to maintain bat access, unless surveys indicate bats are not present and habitat is unsuitable." "Buildings and bridges must be inspected prior to removal or reconstruction to identify bat use. When bats are present, removal should not begin until bats have left for the season." "If old buildings or bridges are removed and are not replaced, bat structures must be installed to provide habitat";
5. A standard or guideline should be added to eliminate or limit disturbance, such as from mining and recreation, of known and potential roost sites, especially roost sites, maternity colonies, and hibernacula; human activity in and near roosts must be minimized or eliminated, particularly during reproductive and hibernation periods.
6. The Townsend's big-eared bat should not be a focal species because it is not a good barometer for the health of the Forest. Some commenters stated the monitoring plan should make it clear that cave and other roost site monitoring should occur in both wilderness and non-wilderness areas.

Response

1, 3, 4. Plan components for bats were refined and clarified in the forest plan. Several plan components protect the key habitats for bats, including winter hibernacula and maternity roosts. A section on caves was added to the forest plan, and guidelines that are beneficial for maintaining or restoring ecological conditions of caves and associated animals (including various bat species) are now included in that section (FW-GDL-CAVES-01 through 03). As explained in chapter 1 of the forest plan in the "Plan components" section, subsection "Guidelines," the intent of a guideline must be met, but the methods needed to meet the intent may vary on a site-specific basis.

Additionally, guidelines FW-GDL-CAVES-01 through 03 and desired conditions FW-DC-CAVES-01 through 06 benefit multiple bat species.

2. Riparian areas and wetlands are key features providing for feeding, day roosting, and connectivity of bat habitats. Aquatic and riparian habitats used for feeding and day roosting are abundant and well distributed across the Flathead National Forest. Plan components for aquatic habitats, riparian management zones, snags, and defective live trees would protect this habitat and its distribution across the landscape (for example, see standards FW-STD-RMZ-05 and 06, FW-STD-TE&V-03, GA-HH-STD-01, GA-NF-STD-01, GA-SF-STD-01, GA-SV-STD-01, GA-MF-STD-02, and GA-SM-STD-02 and guideline FW-GDL-RMZ-10).

5. As stated on page 311 of the draft EIS and also in the discussion of Townsend's big-eared bats in section 3.7.4, subsection "Cliff, cave, scree, and rock habitats," of the final EIS, the Flathead National Forest does not have known maternity roosts but does have hibernacula. The majority of the Forest's caves are in wilderness, and many of them are very remote. Existing wilderness areas have been withdrawn from mineral entry, so these caves are protected. Based upon the best available scientific information about known threats, the key standards and guidelines listed above are sufficient to protect the Townsend's big-eared bat and other bats on the Forest.

6. The spreadsheet documenting the rationale for all species considered for species of conservation concern status can be found at <https://www.fs.usda.gov/detail/r1/landmanagement/planning/?cid=fseprd500402>. The forest plan includes a monitoring item for bat habitat in chapter 5 (MON-WL-06). A monitoring guide, including more specific information on types, locations, and frequency of monitoring, will be developed based upon the best available scientific information. Monitoring has occurred and may continue to occur in wilderness as well as non-wilderness areas. The presence of bats has been noted and will continue to be noted during cave monitoring. Monitoring of bats and bat habitat has been a cooperative effort by the Forest Service and other partners, including but not limited to the Montana Natural Heritage Program. Plans are intended to be adaptive; the forest plan can be amended or revised in the future if needed.

Travel Management Plan

Comment (letter numbers 51, 2842, 2904, 2940, 3013)

The Forest should have a public disclosure of the process of travel planning, and it must be re-started and presented to the public as a "Motorized Closure Plan" so that the public understands the true intent of the process and can become involved accordingly. All alternatives presented at this time represent significant reductions in motorized access and the quality of the motorized experience.

The Forest should include standards that establish minimization criteria for projects that propose to create or modify off-road vehicle area or trail designations in the forest plan. The Forest should demonstrate in the plan how each area and trail as well as the aggregate system minimizes—not just considers—impacts to forest resources and other existing and projected recreation uses. The aggregate system includes limited cross-country driving zones for dispersed camping or game retrieval, as allowed under the travel management rule.

The forest plan does not cover trails, and it should.

The Forest should provide guidance for the management of roads to benefit grizzly bears during travel planning and should not allow travel planning to determine forest plan components.

The Forest should include plan components that comply with the travel management rule, the 2015 over-snow vehicle rule, and Executive Orders 11989 and 11644.

The Forest should create and carry out a strategy for monitoring the impacts of off-road vehicle use on Forest Service-administered lands and make the monitoring results available to the public, including recommendations for amendments or rescissions of off-road vehicle designations. The monitoring strategy should include indicators that trigger action under Section 9 of the executive orders, and, if relevant, the strategy should also address monitoring trigger points.

Response

A range of alternatives is considered and analyzed in the EIS, including alternative D, which would not reduce motorized access. The responsible official considered all points of view and strived for providing multiple uses in making his decision. The preferred alternative identified in this decision is alternative B modified, which is the result of robust public engagement efforts since 2013. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction. Site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan, and additional opportunities for public engagement will occur at that time.

The forest plan is not intended to take the place of travel analysis. The Flathead National Forest completed an analysis of its existing road system in 2014, and the information contained in this analysis (see USDA, 2014c) forms the basis for some of the road-related objectives contained in the forest plan. Future travel planning must comply with the forest plan. Plan components in the forest plan are based upon the best available scientific information on the NCDE grizzly bear population and its habitat conditions when the population was known to be increasing in numbers, distribution, and genetic diversity. See also the comments and responses under Best Available Scientific Information—Grizzly Bear.

Numerous plan components address trails and national scenic trails, including, for example, desired conditions FW-DC-IFS-03, 04, 07 through 11; objective FW-OBJ-IFS-03 through 05; desired conditions FW-DC-NST-01 through 04; and guidelines FW-GDL-NST-01 and 02. In the final EIS, the sections on trails in section 3.10.2 and in section 3.10.3, subsection “Access,” also discuss trails on the Forest.

The forest plan, final EIS, and draft record of decision contain the information needed to demonstrate compliance with the minimization criteria associated with Executive Orders 11644 and 11989 regarding off-road use of motor vehicles on Federal lands.

Direction for the monitoring and evaluation of forest plans is found under the 2012 planning rule at 36 CFR § 219.12 and in the directives in the Forest Service Handbook (1909.12 chapter 30). The plan monitoring program must contain one or more monitoring questions and associated indicators addressing each of the following:

- progress towards meeting the desired conditions and objectives in the plan, including providing multiple-use opportunities;
the effects of each management system to determine that they do not substantially and permanently impair the productivity of the land; and
- ecosystem services/social and economic (see final directives).

The monitoring program includes a description of elements related to recreation; one relates to the status of the trail system but is not specifically designed to monitor the impacts from off-road vehicles. The monitoring program has not identified specific triggers that would compel certain actions to be taken.

Vegetation Management

Vegetation Management—Desired Conditions

Comment (letter numbers 290, 2574, 3009)

The Forest should not expect lands within the suitable timber base to make up for shortfalls to achieving desired conditions forestwide because most of the Forest is subject to forces that are beyond the Forest's control (fire, climate change), with only a small percentage available for active management.

The forest plan should include western white pine as a dominance type.

Response

As the commenter states, most of the Forest will be affected primarily by natural disturbances such as wildfire, with active management through mechanical vegetation treatments limited to a relatively small portion of the Forest. Management area allocations and associated management emphases, as well as the physical and ecological conditions of the Forest, influence the management approach and types of management tools available for use in a particular area to achieve desired vegetation conditions. The effects related to the different management flexibilities by management area are evaluated in section 3.3.2 of the final EIS, which has been expanded and clarified compared to the draft EIS. Active and passive management approaches and methods are discussed. The desired conditions in the forest plan indicate a desire for certain conditions to exist across the landscape, but, ultimately, “forces beyond our control” could override any changes that the Forest might achieve through active management. These uncertainties have been and will continue to be present, but progress towards desired conditions will be monitored and evaluated over time. Uncertainties do not preclude the fact that the Forest must “provide for social, economic and ecological sustainability” (such as threatened and endangered species, primitive recreational experiences), considering all National Forest System lands. The assortment of appropriate plan direction is ultimately determined by the deciding official.

The forest plan components reflect the desire for an upward trend in western white pine, and desired conditions for its presence are provided in the plan in sections on the warm-moist and parts of the cool-moist potential vegetation types. For western white pine to qualify as a dominance type, there would have to be greater than 40 percent of the stand (basal area or trees per acre) composed of western white pine. The Forest's natural range of variation analysis and assessment of western white pine current conditions suggest that the western white pine dominance type has always been fairly limited in extent across the Forest. However, it has been and continues to be widely present within stands as a co-dominant or minor species, and this is the metric that the plan is focusing on. Refer to discussions in section 3.3.3 of the EIS for more information on the ecological role western white pine fills on the Forest.

Vegetation Management—EIS Analysis

Comment (letter numbers 44, 2940)

The Forest should explain more clearly in the EIS that the effects of natural disturbances are different than the effects of mechanical treatments. The statements about the benefits of active management to achieve desired ecosystem conditions and resilient forests are biased. The Forest should provide documentation that supports statements on the benefits of active management.

The EIS is inconsistent in stating that the lack of economically feasible access is one of the conditions that may occur in areas designated as suitable for timber production (draft EIS, vol. 1, p. 207). The wording suggests that these areas should actually be unsuitable for timber production.

Response

The final EIS differentiates between active management (e.g., mechanical treatments, prescribed fire) and passive (e.g., natural disturbances primary) and notes that each have benefits and drawbacks in terms of their contribution to achieving desired conditions across the landscape. Additional information has been added to the final EIS to strengthen and provide more information and clarify the distinction between natural disturbances and active management and to describe the management approaches the Forest is incorporating into the plan (see final EIS, section 3.3.2, subsection “Forest plan management areas and management approaches”).

The reference in the comment to the statement in the draft EIS regarding the economic feasibility of access for timber harvest was not meant to be a statement on the suitability for timber production. It does not imply that it would never be economically feasible to access these lands. The point is that removing roads would reduce access for timber harvest and could be expected to result in more costs associated with harvest activities due, for example, to constructing temporary roads or the use of other logging methods such as helicopters. The wording in the paragraph referenced in the comment has been clarified to try to avoid this confusion. The differentiation of general forest management areas 6a, 6b, and 6c is based on a broad, programmatic review of forest lands as to desired conditions and possible limiting factors to timber production. The high cost of access for logging (such as areas that would require new road construction and/or the use of helicopter logging methods) is one of the factors that affect the ability to provide a regulated flow of timber over a rotation period. Desired conditions in the forest plan would be the basis for whether or not to treat specific areas. Project-level analysis would evaluate the effects, including the economic effects.

Vegetation Management—General

Comment (letter numbers 2580, 2830, 2938, 2940, 2996, 3009, 3116)

The Forest should ensure that implementation of forest treatments will follow forest plan direction and project-level prescriptions so that preferred outcomes are achieved. Forest management for healthy forests should not have to be funded through the harvest of trees, which puts wildlife habitat values and old growth at risk. The Forest should continue active management and should support healthy native plant communities.

The Forest should add to the introduction of the section on the Swan Valley geographic area in the forest plan more mention of the high quantity and quality of wetland plant communities in this geographic area.

There is an apparent inconsistency in section 1.4.1 of the draft EIS. Changes in vegetation management strategies were listed as a reason for new management direction requirements.

Vegetation management strategies are an outcome of the planning process and not a reason for the new plan.

Response

The forest plan provides programmatic direction and makes no decisions on site-specific treatments. Project-level decisions, including opportunities for public comment, must still be made to implement any site-specific vegetation management activities, and these decisions must be consistent with forest plan direction. Monitoring will help to determine whether progress towards desired conditions is being achieved and whether compliance with plan components is occurring. This includes, but is not limited to, protection of old growth and wildlife habitat. Identifying specific funding sources for forest management is outside the scope of this plan revision process.

Changes have been made in the Swan Valley geographic area description, as requested. Also, to avoid confusion, the reference to vegetation management strategies was dropped from the text in the final EIS, section 1.4.1.

Vegetation Management—Grass, Shrub Types**Comment** (letter number 2580)

The Forest should continue to actively manage the Forest, specifically treatments that create early seral habitat benefiting a variety of wildlife, especially elk.

Response

The Forest agrees with the concept of using active management in portions of the Forest to create the desired diversity of forest structures and other vegetation conditions. Tree harvest is one of the tools used to achieve the Forest's management strategy of providing for the full spectrum of ecosystem diversity and maintaining resilient forests. Desired conditions for wildlife habitat diversity that supports the full range of native wildlife species while contributing desired goods and services to people are incorporated throughout the forest plan (e.g., see FW-DC-TE&V-09 and 19). For information and effects of the forest plan on forest ungulates, refer to "Forest ungulates" in the subsection "Coniferous forest habitats" under section 3.7.4 in the final EIS.

Vegetation Management—Models**Comment** (letter number 2940)

The Forest should provide summary tables and graphs in the final EIS showing the modeled effects on the vegetation key ecosystem characteristics (similar to or combined with the graphs showing current and desired conditions).

Response

These graphs were included in appendix 2 of the draft EIS. They display the projected change in vegetation over five decades as well as the desired and current conditions. The same graphic displays are included in the final EIS, with updates due to model modifications between the draft and final EIS. See Trechsel (2017a) and Henderson (2017).

Vegetation Management—Old Growth

Comment (letter numbers 42, 47, 54, 187, 200, 290, 2649, 2830, 2892, 2940, 2984, 2987, 2996, 2998, 3009, 3021, 3097)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest Service should clearly distinguish and define the difference and similarities between old-growth forest and old-growth habitat.
2. The Forest Service should have specific targets for the amount of old-growth forest that are similar to historical amounts.
3. The forest plan has inadequate protections for old-growth maintenance, enhancement, and recruitment. The Forest Service should preserve all existing old growth and encourage development of future old growth. Large-scale disturbances, such as stand-replacement wildfire, make the case for preserving existing old growth and mature forest in mesic and dry forest types even more compelling.

Other specific points brought up in comments related to protection of old growth are:

- Recruitment of old growth is required by the USDA policy statement of 10/11/89.
 - Strategies (appendix C) should not be discretionary but should be required actions (standards or guidelines).
 - Old growth should not be salvaged after fire, and if old growth is burned, replacement old-growth areas should be established.
 - Desired conditions should specifically recognize how old growth on the Forest compensates for the removal of old growth on other ownerships, taking into account the entire ecosystem.
4. The desired conditions for very large trees as written would not allow the Forest to meet the desired conditions to maintain the existing amount of old-growth forest because the low end of the desired range is less than the amount of old growth. Very large trees are an important forest component, and the forest plan lacks sufficient protection to very large trees, seeming to focus only on stands in the very large forest size class.
 5. There is no analysis in the EIS of how the loss of old-growth habitats will affect the connectivity or spatial arrangement of old growth or future old growth, nor are there standards and guidelines that deal with the issue. The forest plan should include stronger direction that ensures connectivity of old-growth habitat, addresses the issue of declining old growth, and provides direction on the spatial arrangement of old-growth patches. The wording in the connectivity analysis implies that old growth can be rapidly regrown through succession (draft EIS, vol. 1, p. 366 under “Coniferous forest connectivity”).
 6. Recruitment of old growth through vegetative manipulation is speculative and may defeat the purpose it purports to serve. The Forest Service should provide a more thorough analysis and scientific justification in the EIS to support the benefit of manipulating existing old-growth forest and developing forests into future old growth, as well as a better analysis of the conditions necessary to sustain viable populations of old growth-associated wildlife.

Response

For all these comments, refer also to the documentation of existing conditions and effects to old-growth forests in the final EIS (section 3.3.6), which has been expanded to provide additional information and analysis. Refer also to section 3.7.4 on wildlife diversity (subsection “Old-growth forest, very large live tree habitat, and very large dead tree habitat”) and section 3.7.6, Wildlife habitat connectivity, for discussion and effects analysis of old-growth-associated wildlife species and connectivity of habitat.

1. To eliminate the confusion, the use of the term “old-growth habitat” has been removed from the forest plan; “old-growth forest” is now the only term used. The term is defined in the plan’s glossary and directly references the publication *Old-Growth Forest Types of the Northern Region* (Green et al., 2011). This publication provides a detailed description and definitions of old-growth forest and also describes the appropriate way to apply these definitions at the site-specific level. The term “old-growth habitat” is still used in the final EIS in the wildlife sections, where considered appropriate. Old-growth habitat is defined in the glossary associated with the final EIS.

2. Setting a specific target for the amount of old-growth forest is infeasible. The ability to quantify historical amounts of old-growth forest and the natural range of variation is problematic because of the site specificity of the old-growth forest definitions and the need for field inventory to confirm its presence and location. For more details, see section 3.3.6 in the final EIS, subsection “Historical old-growth forest conditions.” The plan direction emphasizes the protection of existing old-growth forest and the development of future old-growth forest (to the degree that the Forest is able to do so), understanding that natural disturbance processes and forest succession will continue to be the primary means by which old-growth forest is created and removed on the Forest. Refer to the environmental consequences to old-growth forest in section 3.3.6 of the final EIS.

3. Within the limits of the Forest’s capability, the forest plan protects all existing old-growth forest and encourages the recruitment of old-growth forest over time, recognizing that old-growth forest conditions are not static. Old-growth forest has been protected since 1999 under an amendment to the existing 1986 forest plan (alternative A), and the alternatives incorporate the direction in the existing plan with some editing and clarification to better comply with the 2012 planning rule and directives (refer to section 1.4.6 in the final EIS and to table 26 in section 3.3.6 in the final EIS). As in the existing plan, stands that are currently old-growth forest may not be treated to the extent that they no longer meet old-growth forest definitions (FW-STD-TE&V-01). This standard also restricts the type of management activities that may occur in old-growth forest. Within the limits of the Forest’s control, this is the direction that supports the desired condition to maintain existing old-growth forest. The analysis in the EIS (section 3.3.6) recognizes that the primary cause of loss of old-growth forest on the Forest is due to the effects of natural disturbances such as wildfire or epidemic levels of insects or disease.

In addition, the forest plan strengthens certain aspects of the original old-growth direction, such as by recognizing the importance of promoting the development of future old-growth forest and addressing the desired pattern and patch sizes of old-growth forest (see FW-DC-TE&V-14). The forest plan also has guideline FW-GDL-TE&V-07, which states that to maintain connectivity and avoid adverse impacts to old-growth forest values, new road construction or reconstruction should not be located within old-growth forest. Exceptions may occur, such as when there are no feasible alternative road locations. Guideline FW-GDL-TE&V-09 also contributes to the development of old-growth forest over time by retaining large live trees within harvest areas.

Similarly, FW-GDL-RMZ-08 and 09 contribute to the current and future connectivity of old-growth forest and other wildlife habitats containing large and very large trees.

The value of the various old-growth forest attributes to wildlife, such as very large live and decayed trees, downed wood, and other components of complex forest structure, is well documented in the scientific literature (refer to section 3.7.4 in the final EIS, subsection “Old-growth forest, very large live tree habitat, and very large dead tree habitat”). The forest plan includes direction that recognizes the value of these attributes and their potential contribution to future old-growth habitat, such as by desired conditions (FW-DC-TE&V-12, 15, and 16) and standards or guidelines for snag and live tree retention within harvest units (FW-STD-TE&V-06 and associated snag retention standards within each geographic area and FW-GDL-TE&V-09).

Old-growth forest burned by high-severity fire no longer meets the definition of old-growth forest, as stated in the forest plan. However, it is acknowledged that burned old-growth forest is more likely than burned younger stands to provide ecological benefits and habitat values in the form of large snags and decadent trees. Thus, guideline FW-GDL-TIMB-03 aims to preserve the valued larger snags and live trees in salvage units within fire areas and in particular in forests that were old-growth forest prior to being burned. See the comments and responses under Forest Products—Salvage for more information related to salvage harvesting.

The cumulative effects analysis documented in both the terrestrial vegetation section of the final EIS (section 3.3.11) and in the wildlife section (section 3.7.4, subsection “Old-growth forest, very large live tree habitat, and very large dead tree habitat”) document the effects to old-growth forest related to activities on adjacent non-national forest lands.

Forest plan direction related to old-growth forest complies with a USDA policy statement referenced by a commenter (“USDA Old growth policy statement of 10/11/89”). This policy does not actually “require” protection or recruitment of old growth; rather, it affirms and articulates the value of old growth and the need to better define and learn more about it.

4. The comment is referring to the very large forest size class desired conditions and how the Forest’s ability to meet the desired condition to maintain existing old-growth forest is inhibited because the low end of the desired range is below the existing amount of the very large forest size class. It is important to understand that most of the forest currently in the very large forest size class is not old-growth forest because it does not have the required characteristics of old-growth forest (Green et al., 2011); also see table 24 in the final EIS). However, the very large forest size class is more likely to qualify as old growth forest than are other forest size classes. Refer to section 3.3.6 in the final EIS, subsection “Affected environment,” under “Existing old-growth forest conditions” for more detailed discussion. However, in response to this comment and to more clearly portray the Forest’s desire to maintain the presence at the forestwide scale over time of the very large forest size class, the lower range for some of the desired conditions in this size class have been adjusted to be equivalent to the estimated existing amount.

It is true, as noted by the commenter, that the presence of very large trees is not limited to the areas that are classified as very large tree size class or to old-growth forest (see more information on this in section 3.3.4 of the final EIS, under the “Affected environment” section on very large live trees). The desired condition and other direction in the plan related to very large trees applies no matter where these trees occur. The forest plan and the EIS acknowledge that very large trees are a dynamic component, continually created through succession (which can be accelerated with the thinning of younger forests) and continually changed by disturbances (such as wildfire, insects, disease, and, to a lesser extent timber harvest). The desired condition and other forest

plan direction focus on encouraging the kinds of forest conditions that maintain or increase the density and distribution of very large live trees across the landscape, especially of the desired species that are the most valuable in terms of contributing to forest resilience and wildlife habitat in both the short and long term. Most of the Forest is within management areas where vegetation change will occur almost exclusively by natural disturbances and succession, with limited ability to control the specific types of vegetation change that may occur (see section 3.3.2 of the final EIS). However, in those areas where more active management approaches may occur, the plan provides direction that would contribute to the maintenance and development of very large live trees over time, such as FW-GDL-TE&V-09 and FW-GDL-RMZ-08, which require leaving live trees within regeneration harvest units, and FW-DC-TE&V-13, which addresses the desire for forest densities that facilitate tree growth for developing larger trees and old-growth forest conditions in the future. Appendix C provides some possible approaches to the development of old-growth forest over time.

5. The Forest has desired condition FW-DC-TE&V-14, which addresses maintaining existing amounts of old-growth forest and fostering an increasing trend in the amount, patch size, and connectivity of old-growth forest into the future. The Forest is not able to predict where future large-scale disturbances will occur, but it has modeled these disturbances as well as their effects on vegetation and wildlife (see EIS appendices 2 and 3). Commenters correctly state that fire is a natural process, and in the EIS it is acknowledged that old-growth forest is a dynamic condition and that fire will continue to be both a driver and stressor of old-growth forest structure. Based upon Forest Inventory and Analysis monitoring data, stand-replacing wildfire in the cool-moist potential vegetation types has reduced and is likely to continue to reduce existing old growth across the Forest. Refer to section 3.3.6 of the final EIS for additional information.

The statement in the draft EIS on page 366 that the commenter mentions reads, “Recognition of the role of natural disturbance on the Forest necessitates an acceptance that connectivity provided by forest cover will change over time at a small or intermediate scale, and that most species are adapted to such changes, but that rapid succession will maintain connectivity at a large scale.” This statement is not meant to imply the rapid development of old-growth forest. It makes the point that vegetation change is a normal and natural part of this ecosystem and that areas of dense forest providing cover do not remain in the same location or pattern over time. Areas important for animal (especially larger carnivore) movement, both within home ranges and at the landscape scale (corridors), are recognized in the development of the action alternatives and the preferred alternative through the use of management area designations where more limited vegetation management would occur (e.g., management area 5, backcountry, or management area 6a, general forest low-intensity vegetation management). See also the comments and responses under Alternatives—Wildlife Connectivity Effects, Wildlife—Modeling and Managing Connectivity, and section 3.7.6 of the final EIS.

6. Additional discussion has been added to the final EIS on treatment approaches and the supporting science that could support the maintenance or development of old-growth forests (see section 3.3.6). The forest plan provides direction that limits the kinds of treatments that may be applied in old-growth forest. Specific conditions must be met to protect its values and attributes (FW-STD-TE&V-01). Site-specific analysis at the project level, supported by the necessary science, is the appropriate place to determine whether a specific old-growth forest stand would or would not benefit from treatment.

Treatment of non-old-growth forests for the purpose of promoting future old growth likewise would be evaluated and supported at the site-specific, project level. Appendix C of the plan

provides possible approaches that may be applied and recognizes that possible strategies may change based upon site-specific conditions, changing science, and monitoring. A key approach is to promote stand conditions that enhance tree growth to increase the potential that very large trees—a critical component of old-growth habitat—may develop. Since stand and site conditions vary considerably, as well as desired conditions for other resources reflected in the project objectives, the Forest believes that the project-level analysis is the appropriate place for very large live tree retention prescriptions to be developed (see FW-GDL-TE&V-09). Approaches and prescriptions that might be used that are consistent with plan components are outlined in appendix C of the plan. The approaches within appendix C would apply to the existing plan as well as the alternatives, since the underlying concept of treatments within existing old-growth forest and of treatments to develop larger old-growth forest patches in the future is also part of the existing plan.

Vegetation Management—Roads

Comment (letter number 3009)

The Forest should incorporate plan components that limit road construction and/or require decommissioning and/or closing of roads to reduce off-road vehicle use and weed invasions.

Response

The responsible official reviewed plan components related to road construction and reconstruction, as well as noxious weed components, in the forest plan and believes that the desired conditions, standards, and guidelines are sufficient to provide necessary protection to the resources. Direction associated with the management of habitat conditions for the grizzly bear would limit both road construction and road use, which would contribute towards the reduction of off-road vehicle use and weed invasions mentioned by the commenter (e.g., see FW-STD-IFS-01 through 03). Site-specific road management options would be analyzed during project analysis to retain flexibility in response to site-specific conditions and resource objectives. Forest plan components (see the Infrastructure section of the plan, such as the section on limits on total road density) guide how such activities should be done (such as applying best management practices and maintaining natural hydrologic flow paths). It is recognized that there are areas across the Forest where it would be desirable to decommission or place roads into intermittent or long-term stored service (see “roads” in glossary); the miles to be treated under anticipated budgets are provided as objectives in the Infrastructure section of the plan.

Vegetation Management—Role of Fire and Fire Management

Comment (letter numbers 2765, 2940)

The Forest should be identifying and mapping habitat types at every level of analysis, from project to forest plan level, to ensure that the fire regimes prevalent across the area are not overlooked.

The wildland-urban interface should be recognized and mapped as a different management area because there are different desired vegetation conditions within the wildland-urban interface.

The plan also needs to more clearly define and identify the areas where different desired conditions for fire frequency, intensity, and behavior occur in order to provide the basis for managing vegetation.

Areas where different levels of fire suppression efforts would occur are not identified in the plan, nor is the desired role of wildfire in different areas of the Forest. What locations or circumstances would lead to differences in fire's role and fire suppression intensity? There is no way to evaluate differences in the alternatives or where patch sizes would be smaller or larger without identification of these areas with different fire management direction and expectations.

Response

Potential vegetation types are groupings of habitat types and are the basis for many of the plan components associated with vegetation conditions and management. Maps of potential vegetation types are provided in the forest plan (appendix B). As noted by a commenter, potential vegetation types provide insight into the biophysical environment and the ecological processes and functions (including natural fire regimes) that occur across the Forest. The maps are derived from relatively coarse-level GIS databases and are most useful for conducting broad-scale analysis, such as at the forest plan level. Habitat types, and the associated potential vegetation type, are verified at the project level, typically while conducting reconnaissance and surveys that gather the site-specific information on the forest and habitat conditions necessary for developing proposed treatments. This information is then integrated into the design of vegetation management alternatives for the project.

Vegetation is not described by management area; it is described forestwide or by potential vegetation type. The wildland-urban interface is not created by the Forest Service, and it has the potential to change (e.g., Flathead and Missoula Counties are in the process of updating their Community Wildfire Protection Plans from which the wildland-urban interface is generated). However, the responsible official considered the current location of the wildland-urban interface in the identification of management area allocations for the preferred alternative, B modified.

Fire frequency, intensity, and behavior on the Forest are described in the assessment (USDA, 2014a). Note that this varies annually to some degree as fires occur on the landscape.

The forest plan does not map fire response because the intent is that the response will vary based upon the conditions of the particular season, timing during the summer, fuels conditions, etc.

Vegetation Management—Snags

Comment (letter numbers 14, 290, 2574, 2940, 2996, 3009)

The forest plan's standard for snag retention within harvest units is good.

The forest plan's standard for snag retention within harvest units should be strengthened.

The forest plan's standard for snag retention within harvest units is too restrictive; the Forest should allow more flexibility at the project level to determine the appropriate scale for applying retention numbers.

The desired conditions in the forest plan direction for snags are insufficient to ensure that the amount of snags and downed wood is consistent with the natural range of variation and provides for wildlife habitat needs. Concerns noted are as follows: (1) the desired range is too low; (2) conditions should be established at a smaller scale than the Forest (such as by geographic area); (3) the importance of smaller snags (i.e., down to 10 inches d.b.h.) is not taken into account; and (4) snags along open roads should be protected.

The timber harvest model does not seem to have captured the potential effects on snags of various harvest scenarios, particularly salvage harvest.

Response

Desired conditions for snags are based upon the best available information related to the natural range of variation at the forestwide scale. The analysis and documentation related to snags has been expanded in the final EIS and in planning record exhibits (Trechsel, 2017e) to address some of the points made by commenters as well as to incorporate an updated snag condition analysis based on new information. Refer to the final EIS, sections 3.3.7 and section 3.7.4, subsections “Old-growth forest, very large live tree habitat, and very large dead tree habitat” and “Burned forest and dead tree habitats.” The responsible official believes that the forest plan components related to snag desired conditions, and the standards and guidelines that direct how activities that may affect snags and snag habitat must be conducted, will provide for the needs of snag-dependent wildlife species as well as for downed wood habitat.

Snag conditions have high natural variability over time and space, as would be expected considering the types of natural disturbance regimes common in this ecosystem. Monitoring indicates that snag sizes and densities forestwide are consistent with natural disturbance regimes and are currently at relatively high levels due to the large area that has recently burned across the Forest. The vegetation and snag conditions across the majority of the Forest (over 65 percent of the Forest; see table 20 in the final EIS, section 3.3.2) are affected mainly by natural disturbances such as fire because they are in designated wilderness and other allocations that have a low amount of human influences. Depending upon the alternative, from 78 to 87 percent of the Forest is designated as unsuitable for timber production (see section 3.21.2, table 148, in the final EIS). Thus, it is likely that snag conditions forestwide will remain consistent with natural variation into the future as well, due to the expected amount of fire, insects, and disease (as modeled into the future—see appendix 2). However, the Forest recognizes that past and potential future forest management activities affect snag amounts and distribution and that snag densities tend to be lower in areas where more intensive vegetation management has occurred or will continue to occur or in areas that are more accessible to the public for firewood cutting. The more detailed snag analysis conducted for the final EIS, which uses updated snag conditions estimates (Trechsel, 2017e), evaluated the distribution of existing snag habitat at four spatial scales: the Western Montana Zone (Flathead, Kootenai, and Lolo National Forests combined); the Flathead National Forest; inside and outside wilderness/roadless areas on the Flathead National Forest and the Western Montana Zone; and within each Flathead National Forest geographic area. This updated analysis guided the development of the forest plan’s desired conditions, standards, and guidelines related to snags. The snag standard has been refined in alternative B modified compared to the previous version of the plan (March 2016); snag retention standards are now included for the geographic areas, and in some areas requirements for the retention of snags down to 10 inches d.b.h. are incorporated.

In addition, alternative B modified includes plan components for snags and downed wood within riparian management zones to provide for greater structural diversity in these areas when conducting timber harvest (FW-DC-RMZ-03 and FW-GDL-RMZ-10). Riparian management zones are expected to contribute considerably to the desired distribution of snag habitat, even in areas where active timber harvest occurs. The forestwide and geographic area scales have been determined to be appropriate for the programmatic direction provided by the forest plan. Because existing and potential snag habitat varies widely across the Forest, the project level is the appropriate scale for evaluating site-specific snag habitat conditions and developing prescriptions

that will meet forest plan direction. At the project level, multiple resource objectives and desired ecological, social, and economic conditions will be integrated in the analysis. It is up to the deciding official to determine the appropriate mix of multiple uses and benefits from the project area.

One commenter questioned whether the model captured the potential effects on snags of projected harvest under the alternatives. As described in appendix 2 of the final EIS (p. 2-15), the amount of snags were included in the yield tables. Snag levels were calculated for each cover type and size class in the Spectrum model and were modeled using Prognosis. The yield tables then track snag amounts as they change based on harvest, prescribed burning, or wildfire. The prescription for regeneration harvest provides for the retention of trees as future snags. Thus, the model did provide for snags in the projected harvests. Salvage harvest was not a treatment analyzed in the Spectrum modeling as it is not a harvest type that is included in calculation of projected timber sale quantities. Refer also to Trechsel (2017e) for the model outputs.

Vegetation Management—Standards

Comment (letter number 2574)

The Forest should drop certain standards in the plan that are related to the Northern Rockies Lynx Management Direction that are unnecessary because they are already covered by other plan direction.

Response

The Forest agrees that TE&V-STD-01 is unnecessary, and it has been dropped. TE&V-STD-03 is included in the plan because it is necessary to incorporate the new exception category for whitebark pine restoration. All remaining vegetation management direction in the Northern Rockies Lynx Management Direction (USDA, 2007a) is unchanged and is included as appendix A of the plan.

Vegetation Management—Whitebark Pine

Comment (letter numbers 108, 233, 2869, 2985, 3009, 3010, 3087, 3097)

The Forest does well in recognizing and supporting the restoration of whitebark pine and in allowing restoration activities (prescribed fire, planting) within recommended wilderness. The Forest should also allow whitebark pine restoration activities within designated wilderness.

The Forest should not allow the application of restoration activities within recommended wilderness or within wilderness.

The Forest should adopt an experimental approach to whitebark pine restoration treatments in recommended wilderness, allocating areas to different strategies and comparing results.

Response

The Forest appreciates the support for the plan components related to the restoration of whitebark pine. Actual implementation of restoration activities anywhere on the landscape, including recommended wilderness, would be preceded by a site-specific analysis and consideration of a variety of factors related to values associated with recommended wilderness. Appendix C clarifies and references science and sources that would guide potential management approaches. Applying an “experimental” approach to restoration activities could certainly occur, and appendix C notes

this as well. The plan does not change current direction for designated wilderness, where management is largely guided by the Wilderness Act and individual wilderness management plans.

Wild and Scenic Rivers

Wild and Scenic Rivers—Commercial Use Permits

Comment (letter number 2950)

The Forest should include plan components that restrict the number of commercial user days during popular times and in popular areas and encourage private party use on the river system to minimize heavy use.

Response

The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions would need to be made following appropriate procedures. A site-specific analysis, in compliance with the National Environmental Policy Act would need to be conducted in order to restrict the number of commercial use days.

Wild and Scenic Rivers—Forest Plan Components

Comment (letter numbers 217, 2801, 2839, 3094, 3097)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should make available online the Flathead Wild and Scenic River Management Plan (USDA, 1980).
2. The Forest should develop a comprehensive wild and scenic river plan for the Flathead Wild and Scenic River that is up to date and that has more specific plan components (e.g., resolve sanitation issues at Sondreson Meadows).
3. The Forest should have plan components that state that scenic and recreational river corridors are suitable for non-commercial firewood gathering under MA2a-SUIT-03, to the extent that those activities do not degrade outstandingly remarkable values. The Forest should clarify that scenic and recreational river corridors are suitable for commercial communications sites and utility corridors under MA2a-SUIT-04 only to the extent that those activities do not degrade the values for which the stream was found eligible as described in appendix 5.
4. The Forest should establish a carrying capacity for the Flathead Wild and Scenic River when developing the comprehensive river management plan.
5. The Forest should include a new suitability standard stating: “Eligible stream reaches are not suitable for federally licensed hydropower projects.”
6. The Forest should clarify what “regionally significant” means in appendix 5.
7. The Forest should define why current recreation standards are not being met with the wild and scenic river direction plan.

Response

1. The Flathead Wild and Scenic River Management Plan (USDA, 1980) is part of the planning record.
2. In appendix C, there is language pertaining to completing a comprehensive wild and scenic river plan for the Flathead Wild and Scenic River within the next five years. This is not a plan component but a future management strategy that the Forest may undertake. This document would have more site-specific direction regarding specific issues such as resolving sanitation issues at Sondreson Meadows.
3. The forest plan has the following suitability statements in management area 2a: “Scenic river corridors are suitable for non-commercial (personal) use of non-timber forest products” (MA2a-SUIT-03); “Recreational river corridors are suitable for the commercial and non-commercial (personal) use of non-timber forest products” (MA2a-SUIT-04); and “Scenic and recreational river segments are suitable for commercial communications sites and utility corridors. The scenic section of the North Fork of the Flathead is not suitable for utility corridors” (MA2a-SUIT-05). A desired condition for management area 2a states: “The outstandingly remarkable values of designated wild and scenic rivers are protected and enhanced” (MA2-DC-02). All projects and activities must be consistent with plan components, including desired conditions.
4. When developing a comprehensive river management plan, a carrying capacity is generally established with that process.
5. The Forest did not include the suggested suitability language in the forest plan. The proposal of a federally licensed hydropower project on an eligible river would trigger a suitability study on the river. A suitability study provides the basis for determining which rivers or river segments determined to be eligible for inclusion to the National System should be recommended to Congress as potential additions to the national system. A suitability study will answer these questions:
 - 1) Should the river’s free-flowing character, water quality, and outstandingly remarkable values be protected, or are one or more other uses important enough to warrant doing otherwise?
 - 2) Will the river’s free-flowing character, water quality, and outstandingly remarkable values be protected through designation?
 - 3) Is designation the best method for protecting the river corridor?
 - 4) Is there a demonstrated commitment to protect the river by any nonfederal entities that may be partially responsible for implementing protective management?

In answering these questions, the trade-offs between the benefits and the impacts of wild and scenic river designation must be evaluated and alternative protection methods considered.

6. See the comments and responses under Wild and Scenic Rivers—Protection.
7. The monitoring standards in the Flathead Wild and Scenic River Management Plan (USDA, 1980) for the Flathead River are beyond the scope of the forest plan. There are monitoring requirements associated with the plan. See MON-MA2b-01 in chapter 5 of the forest plan.

Wild and Scenic Rivers—No Designation

Comment (letter numbers 153, 2950, 3011, 3068, 3076)

The Forest should not include any eligible wild and scenic rivers in the plan because it would have negative effects on private lands, the designation would attract more use, and there is no need for additional protection of rivers.

Response

The eligible wild and scenic rivers listed in the forest plan are not on private land, and therefore the management direction does not apply to private lands. The Forest does not know of any studies that show that designating a river as wild and scenic adversely affects the river by increasing its use. The wild and scenic river eligibility study process determined the outstandingly remarkable values for each eligible river, and those values are protected until a suitability study is done to either remove the eligible river or to make it a suitable wild and scenic river. Free-flowing conditions are also protected for eligible wild and scenic rivers.

Wild and Scenic Rivers—Outstandingly Remarkable Values

Comment (letter numbers 2631, 2839, 3098)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should state what the outstandingly remarkable values are for the eligible rivers in the North Fork geographic area.
2. The Forest should expand the eligible rivers to include Basin, Bunker, Morrison, Gordon, Lake, Granite, Dolly Varden, Gorge, Upper Twin, and Lower Twin Creeks.
3. The Forest should add the outstandingly remarkable value of recreation for Graves Creek, Glacier Creek, Elk Creek, and the lower Swan River.

Response

1. The outstandingly remarkable values for the eligible rivers in the North Fork geographic area are shown in the forest plan in table 25. The outstandingly remarkable values for the section of the North Fork of the Flathead River classified as *scenic* are fisheries, geology, water quality, wildlife, botany, recreation, scenery, historic, ethnographic. The outstandingly remarkable values for the section of the North Fork of the Flathead River classified as *recreation* are fisheries, geology, water quality, wildlife, recreation, and history.
2. To be identified as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant when compared with similar values from other rivers at a regional or national scale. The Forest did add a segment of Twin Creek (also known as Upper Twin Creek) from Nanny Creek to confluence to South Fork of the Flathead as an eligible river for the outstandingly remarkable values of geology and scenery. See appendix 5 in the final EIS and the documentation of evaluation of the eligibility of streams on the Flathead National Forest (USDA, 2004/2014) for the supporting data on the documentation sheets for these rivers that explains the ranking. See also the comments and responses under Wild and Scenic Rivers—Protection.

3. The Forest reviewed the following rivers for the outstandingly remarkable value of recreation: Graves Creek, Glacier Creek, Elk Creek, and the lower Swan River. The review did not result in any change in ranking for the recreation outstandingly remarkable value on these four rivers. See appendix 5 in the final EIS and the documentation of evaluation of the eligibility of streams on the Flathead National Forest (USDA, 2004/2014) for the supporting data on the documentation sheets for these rivers that explains the ranking for recreation.

Wild and Scenic Rivers—Protection

Comment (letter numbers 42, 47, 54, 62, 200, 305, 2630, 2632, 2649, 2784, 2801, 2807, 2816, 2833, 2839, 2892, 2987, 2989, 2995, 2998, 3028, 3037, 3051, 3062, 3070, 3081, 3094, 3098)

The Forest should expand the number of eligible rivers that Montanans for Healthy Rivers recommended to include Morrison, Granite, Sullivan, Quintonkon, Gorge, Upper Twin, and Bunker Creeks.

The Forest has streams that have bull trout as eligible for wild and scenic river designation; these streams should be reconsidered based on the conclusion that they deserve the “highest priority for protection,” or an explanation should be provided for why each does not qualify as eligible.

Response

The Forest reviewed the following rivers to validate the existing outstandingly remarkable value ranking: Basin, Bunker, Morrison, Gordon, Lake, Granite, Quintonkon, Dolly Varden, Elk, Glacier, Graves, lower Swan, Whale, Clack, Dolly Varden, Schafer, Gorge, Twin Creek, Lower Twin Creeks. After reviewing these rivers, it was determined that Twin Creek (also known as Upper Twin Creek) had outstandingly remarkable values for scenery and geology, and this was made an eligible river. The documentation of this review can be found in USDA (2004/2014).

The Forest followed the directives in the proposed 2013 Forest Service Handbook 1909.12, chapter 80, sections 82.12 and 82.14. To be identified as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant when compared with similar values from other rivers at a regional or national scale. Unique, rare, or exemplary features are those that are conspicuous examples of these values, among the best representatives of these features, within a region or the nation. Appendix 5 of the final EIS explains in detail how the wild and scenic river eligibility study process was done.

As stated in appendix 5, if a stream is rated a 3, it may have some regional importance, but it does not possess a river-related value that is unique, rare, or exemplary when compared with similar values from other rivers at a regional or national scale. The region of comparison for each resource is documented in appendix 5. Those streams with a resource that was found to be unique, rare, or exemplary when compared to other streams in the region of comparison were rated with an outstandingly remarkable value of 4. As documented in appendix 5, only those streams rated as 4 were identified as eligible for inclusion in the National Wild and Scenic River System. For fish, the outstandingly remarkable value was based on both population and habitat. The measures for population were the presence of bull trout (federally listed as threatened) and the presence of westslope cutthroat trout. The measures for habitat were unique habitat and connectivity and/or crucial habitat. The combination of these two measures was taken into consideration to determine whether the stream had an outstandingly remarkable value for fish and not just the presence of bull trout. In response to comments, a review was made on the following rivers that had a ranking of 3 for fisheries: Basin, Clack, Dolly Varden, Gordon, Gorge, Granite, Lake, Unnamed Fork of Lake Creek, and Schafer. There was no change to the ranking of any of

these rivers, nor was there a change in the eligibility for these rivers. The documentation of this review can be found in appendix 5 of the final EIS. See USDA (2004/2014) for the supporting data on the documentation sheets for these rivers that explains the ranking for fish.

Wild and Scenic Rivers—Reevaluate Eligibility

Comment (letter number 3094)

The Forest should redo the eligibility process and include as eligible all streams ranked a 3 (regionally significant) and also all streams that have core areas for bull trout because of the impacts of climate change.

Response

In response to this and other comments, a review was made of the following rivers that had a ranking of 3 for fisheries: Basin, Clack, Dolly Varden, Gordon, Gorge, Granite, Lake, Unnamed Fork of Lake Creek, and Schafer. There was no change to the ranking of any of these rivers, nor was there a change in the eligibility of these rivers. The documentation of this review can be found in appendix 5 of the final EIS. See USDA (2004/2014) for the supporting data on the documentation sheets for these rivers that explains the ranking for fish. A consideration of climate change was not part of the eligibility determination for fish. See also the comments and responses under Wild and Scenic Rivers—Protection.

Wilderness

Wilderness—Areas Eliminated Under Alternative C

Comment (letter numbers 290, 2632, 2830, 2904, 2987, 2989, 3021, 3062, 3289)

The Forest should consider all or some of the areas within the wilderness inventory areas for recommended wilderness (specific areas are identified).

The Forest should include rationale in the final EIS on why some areas from the wilderness inventory are included or not included as recommended wilderness in the selected alternative.

The Forest should include in the final EIS information on where and why 9,734 acres of inventoried roadless areas were eliminated from the “suitable wilderness” inventory and not included in alternative C.

Response

Alternative B modified includes 190,403 acres of recommended wilderness. The following areas were included in the selected alternative: Alcove-Bunker, Elk Creek, Java-Bear Creek, Jewel Basin, Limestone-Dean Ridge, Slippery Bill-Puzzle, Swan Front, and Tuchuck-Whale. About 30 percent of the lands in the wilderness inventory areas are recommended as wilderness.

See appendix 4 of the final EIS, section “Summary of Management Direction for the Wilderness Inventory Areas by Alternatives,” for rationale for why particular recommended wilderness areas were included or not included in the various alternatives. It is important to note that lands included in the inventory provide a starting point for further evaluation; their inclusion is not a designation that conveys or requires a particular kind of management. The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public needs. The areas

recommended in the decision are an appropriate choice for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments. The Forest revised section 3.16.3 of the final EIS to provide more information on where and why some areas of inventoried roadless areas (approximately 2 percent) were eliminated from the “suitable wilderness” inventory and therefore were not included in alternative C.

Wilderness—Designated

Comment (letter number 217)

The Forest should have additional indicators for designated wilderness in the final EIS, and specific indicator definitions need to be added to define core wilderness character components (untrammled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation).

The Forest should include defined and measurable elements of wilderness character (i.e., untrammled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation) and standards or guidelines to address desired conditions in the designated wilderness environmental consequences.

Response

In designated wilderness, the Forest collects limits of acceptable change monitoring information. For the Bob Marshall Wilderness Complex, a monitoring report is developed every five years using the limits of acceptable change information that was collected and is presented at a Bob Marshall Wilderness Complex public meeting. In addition to limits of acceptable change, the National Wilderness Stewardship Performance is a framework for tracking how well the Forest Service is meeting the primary responsibility of preserving wilderness character under the Wilderness Act. With this framework, data is collected in seven categories: natural quality of wilderness character, undeveloped qualities of wilderness character, untrammled qualities of wilderness character, solitude quality of wilderness character, other features of value quality of wilderness character, special provisions, and administration. Within these categories, the Forest may choose to report on various elements. Each element is worth 10 points; a wilderness that scores 60 points or higher is meeting the baseline for preserving wilderness character. For the Bob Marshall Wilderness Complex, the following elements were chosen: invasive species, natural role of fire, fish and wildlife, recreation sites, agency management actions, opportunities for solitude, cultural resources, workforce capacity, education, and wilderness character baseline. For the Mission Mountains Wilderness, the following elements were chosen: invasive species, natural role of fire, recreation sites, trails, agency management actions, opportunities for solitude, opportunities for primitive and unconfined recreation, workforce capacity, education, and wilderness character baseline.

Monitoring requirements for designated wilderness include the following monitoring question: Do management activities in designated wilderness areas protect, maintain, and preserve wilderness character? These are the potential indicators:

- score on National Wilderness Stewardship Performance elements;
- limits of acceptable change monitoring measures for the Bob Marshall Wilderness Complex and Mission Mountains Wilderness;
- the number and type of authorized motorized use and mechanized transport entry as reported through the USFS INFRA database;

- the number and type of unauthorized motorized use and mechanized transport; and
- the number, kind, and extent of identified actions (e.g., natural and human-caused fire) that have occurred in designated wilderness areas on the Forest.

Wilderness—Fire

Comment (letter numbers 7, 8, 40, 56, 57, 94, 153, 258, 2583, 2649, 2830, 2940, 2949, 2999, 3007, 3008, 3017, 3045, 3052, 3053, 3077, 3122)

The Forest direction in the plan should allow prescribed fire in wilderness.

The Forest should not allow fires to burn under the “let burn” policy so that they move from the wilderness down to communities.

The Forest should not increase the recommended wilderness area in the Swan Valley because there is concern about wildfires being closer to residences. The Forest should not decommission any more roads because that limits emergency vehicle response.

Response

Prescribed fire in wilderness is permitted by policy in Forest Service Manual 2324. The Forest Service Manual describes the situations where prescribed burning in the wilderness can occur. The Forest has recently successfully implemented prescribed fire in the Mission Mountains Wilderness.

The boundary for the Swan Front recommended wilderness area was changed in alternative B modified to reflect the concerns of local constituents. The boundary now matches the existing inventoried roadless area. Management areas 6a, 6b, and 6c focus on mechanical treatments and are the primary force affecting the vegetation on NFS lands around communities. The Swan Front recommended wilderness in the 1986 forest plan was 44,815 acres; the Swan Front recommended wilderness area in the forest plan is 42,534 acres, which represents a decrease of 2,281 acres.

Under alternative B modified, the objective for road decommissioning is 30 to 60 miles of roads over the next 15 years. About 4.5 miles of closed roads in one recommended wilderness management area (Tuchuck-Whale) are on the road system and would need to be removed from the system (decommissioned). Emergency response does not have to occur via roads; often it is done by helicopter or by all-terrain vehicles.

Wilderness—General

Comment (letter numbers 16, 23, 37, 94, 217, 373, 2617, 2639, 2808, 2819, 2860, 3116, 3130, 3267, 3300)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should provide the referenced recreation management direction for the Bob Marshall Wilderness Complex.
2. Those facilities in the National Register of Historic Places registration form for the Flathead National Forest Backcountry Administrative Facilities should be further evaluated through site-specific NEPA processes to determine which facilities are necessary to meet the minimum requirements for the administration of the wilderness.

3. The Forest should not recommend any wilderness. Instead, it should put those lands into primitive recreational areas.
4. The Forest should not recommend any land for wilderness because the Forest cannot currently manage the existing wilderness.
5. The Forest should drop the Fatty Creek recommended wilderness (where snowmobiling is established) adjacent to the Mission Mountains Wilderness if this is a hindrance to adopting a forestwide plan component that does not allow existing mechanized transport and motorized use in recommended wilderness.
6. The Forest should not include recommended wilderness areas that have old clearcuts or logging roads in them as they are trampled by man.

Response

1. The recreation management direction for the Bob Marshall Wilderness Complex can be found on the Flathead National Forest website (<https://www.fs.usda.gov/attmain/flathead/specialplaces>; use quick link to the Bob Marshall Wilderness Complex Recreation Management Direction).
2. When revising a forest plan, the agency must follow Forest Service Handbook 1909.12, not the 2320 handbook. There is no requirement in the 1909.12 handbook to conduct a site-specific analysis to determine whether facilities within the wilderness are necessary to meet the minimum requirements for the administration of wilderness. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures.
- 3, 4. Alternative B modified recommends 190,403 acres of wilderness. The Forest looked at an alternative that did not include any recommended wilderness (alternative D). The decisionmaker carefully considered a range of recommended wilderness areas, as well as other allocations, to determine the mix of land and resource uses that would best meet public need. The areas recommended for wilderness in the preferred alternative are an appropriate choice for the Flathead National Forest in consideration of the wilderness evaluation, alternative analyses, and public comments. The recreation opportunity spectrum class of primitive is assigned to recommended wilderness areas to provide nonmotorized, nonmechanized travel experience. The forest plan includes 316,770 acres of backcountry (management area 5a-5d) that provides a range of backcountry experiences ranging from no motorized transport (management area 5a) to motorized over-snow vehicle use (management area 5d).
5. The Fatty Creek area was included as recommended wilderness in alternatives B and C but not alternative D in the draft EIS. For the final EIS, the Fatty Creek area was included in alternative C. The forest plan does not include the Fatty Creek recommended wilderness area. The Fatty Creek area is allocated to management area 5d (backcountry motorized over-snow vehicle use) in the forest plan.
6. The Forest followed Forest Service Handbook 1909.12 chapter 70 when completing the wilderness evaluation. The first step is the identification and inventory of lands on the Flathead National Forest that may be suitable for inclusion in the National Wilderness Preservation System. In this step, the Forest made the determination that timber harvest areas where logging and prior road construction are not substantially noticeable would be included in the inventory. Areas where regeneration harvest had taken place within the last 40 years and where significant

fire had occurred were reviewed in detail to determine whether they should be included in the inventory. From this inventory, a subset of areas recommended for wilderness were included. Some of these recommended wilderness areas do include past timber harvests and logging roads that were determined to be not substantially noticeable on the landscape to the general visitor. Appendix 4 of the final EIS includes a detail discussion of the inventory process. See step 1, identification and inventory, which includes information on past timber harvests in the wilderness inventory areas.

Wilderness—Limits of Acceptable Change

Comment (letter numbers 217, 2984, 3097)

The Forest should include plan component that incorporate limits of acceptable change for the Bob Marshall Wilderness Complex. The final EIS should include information on which limits of acceptable change standards are not being met and how the plan components will bring the Bob Marshall Wilderness Complex within the limits of acceptable change standards.

Response

The Bob Marshall Wilderness Complex limits of acceptable change is monitored every five years. The management direction for the Bob Marshall Wilderness Complex is part of the 1987 Bob Marshall Wilderness Complex recreation management direction, which can be found on the Flathead National Forest website (<https://www.fs.usda.gov/attmain/flathead/specialplaces>; use quick link to the Bob Marshall Wilderness Complex Recreation Management Direction). The assessment of the Flathead National Forest (USDA, 2014a) discusses the limits of acceptable change monitoring. The monitoring report lists the Forest's limits of acceptable change standards and results of the inventory. It does not identify specific areas that are out of compliance; rather, it identifies long-term trends that guide management rather than directs specific management actions.

Wilderness—Stock Limits

Comment (letter number 2601)

The Forest should reduce the stock limit in the Bob Marshall and Great Bear Wilderness areas from 35 to 20 head of stock and should include a plan component stating that no permanent structures should be built.

Response

Under alternative B modified, MA1a-STD-01 states: "Group sizes in excess of 15 people and 35 head of livestock per party within the Bob Marshall and Great Bear Wilderness Areas shall not be authorized." This is the existing group size and stock size, and at this time, there is no indication this needs to change in the Bob Marshall Wilderness Complex. If conditions change and there is a need to update this, the standard may be revised at a later time. Existing permanent structures for the protection of the wilderness resource are currently allowed in the Bob Marshall Wilderness Complex. Any new structures would need to go through a minimum requirements analysis and site-specific environmental analysis.

Wilderness—Study Areas

Comment (letter numbers 150, 2811, 2904, 3032, 3063)

The Flathead National Forest should managed wilderness study areas the same as designated wilderness and not allow mechanized transport or motorized uses.

The effects of mechanized and motorized uses in wilderness study areas should be disclosed in the EIS.

Response

There are no wilderness study areas (these are designated by Congress) on the Flathead National Forest; therefore, there are no plan components related to mechanized transport or motorized uses in wilderness study areas nor is there any disclosure of effects to wilderness study areas in the final EIS.

Wildlife

Wildlife—Analysis Insufficient

Comment (letter numbers 44, 249, 351, 2875, 2888, 2904, 2940, 3002, 3021, 3042)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The adverse environmental effects are downplayed, and the draft EIS provides only a comparative analysis of alternatives rather than actually documenting effects, so the decisionmaker does not have sufficient information for an informed decision. The draft EIS focuses more on the mitigation effect of plan components than on the actual effects of the plan.
2. The public should be given the opportunity to comment on the draft EIS again once the biological opinion and the final EIS are released in order to address how the consultation and U.S. Fish and Wildlife Service's anticipated effects line up with what the Forest Service has analyzed.
3. The analysis area should be broadened in the final EIS because the 2012 planning rule provides an approach to maintaining and restoring connectivity, both within Forest Service planning boundaries as well as broader landscapes, for the purposes of improving ecological integrity at multiple scales, sustaining wildlife populations and species, and facilitating climate change adaptation.
4. The draft EIS does not adequately describe what is required in the current forest plan, how standards and requirements for different species can be dovetailed into integrated management, and why or why not various aspects of management programs should or should not be carried forward into a broad range of action alternatives.
5. It is not clear which plan components contain specific "routes and areas" that could be used for this effects analysis (draft EIS, vol. 1, p. 479).
6. The draft EIS and draft forest plan fail to meet the requirements of NEPA, the 2012 planning rule, and the Administrative Procedures Act for wildlife habitat connectivity. There should be an explicitly recognized management area with a connectivity management emphasis to successfully conserve the connectivity needed for viable populations of at-risk species.
7. The term "big game" species should not be used.

Response

1. Consistent with the requirements of the National Environmental Policy Act (NEPA), the final EIS discloses the beneficial and detrimental effects of potential management actions as well as plan components that would help to avoid or mitigate those potential effects, keeping in mind that a forest plan is a programmatic document. The Forest has also disclosed uncertainty and opposing science as required by NEPA. The Forest is not “downplaying effects” in meeting these requirements. The final EIS provides detailed quantitative (see lists of tables in each volume), qualitative, and graphic information (see lists of figures in each volume) for each alternative and also presents the effects in a comparative way so that the decisionmaker can make an informed decision, using analyses that are commensurate with the programmatic decision to be made.
2. Due to the complexity and length of the detailed analysis in the EIS, the public was given an extended time period for comment on the detailed proposed action and the draft EIS. The USFWS biological opinions (USFWS, 2017a, 2017b) are posted on the Forest’s forest plan revision website (www.fs.usda.gov/goto/flathead/fpr) so that they are available to the public during the objection period. The Forest carefully considered the U.S. Fish and Wildlife Service’s biological opinions and incorporated their findings in the draft records of decision. Also see the comments and responses under Wildlife—Consultation.
3. The EIS considers ecological integrity at multiple scales and explains the rationale for the analysis area used for wildlife habitat diversity as well as individual species. For example, the analysis areas for wide-ranging species such as the grizzly bear, Canada lynx, and wolverine are quite large and encompass all lands in a broad landscape that encompasses multiple national forests as well as lands owned or managed by others. The cumulative effects analysis area for grizzly bears is the entire Northern Continental Divide Ecosystem (NCDE), which encompasses all or portions of the Flathead National Forest and the following adjacent national forests: the Helena-Lewis and Clark, Kootenai, and Lolo. The Forest Service is amending these forest plans concurrent with revising the Flathead National Forest plan in order to incorporate management direction to sustain the NCDE grizzly bear population. The analysis area for the Canada lynx is critical habitat unit 3 (as defined by the USFWS), which is adjacent to Canada and encompasses the area known to be occupied by the northern Rocky Mountain Canada lynx population. The forest plan is designed to maintain or contribute to ecological conditions that sustain wildlife populations and facilitate climate change adaptation (see final EIS section 3.3 and appendices 6 and 7).
4. The final EIS describes what is required in the current forest plan (see sections on alternative A). Various aspects were carried forward into a broad range of alternatives after considering the existing conditions and trends (USDA, 2014a), after meeting with the public (see the Forest Plan Revision Collaboration, Communication and Conversations webpage: <https://www.fs.usda.gov/detail/flathead/landmanagement/planning/?cid=stelprd3831106>) and after considering written comments received through the scoping process (March 6-May 15, 2015). The forest plan as a whole is an integrated management plan for diverse habitats that support over 300 animal species. The final EIS, section 3.3, first discusses the effects of a variety of coarse-filter plan components on ecosystems or key ecosystem characteristics and then discusses the effects on specific species, including but not limited to federally listed species, species listed as sensitive under the existing forest plan, and species listed as species of conservation concern under the forest plan.

For example, the Terrestrial Ecosystems and Vegetation section of the forest plan includes integrated plan components for maintaining, recruiting, and connecting old-growth forest habitat as well as increasing its patch size in support of species that are associated with old growth. Plan

components also provide for species associated with burned forests, snags, downed wood, caves, cliffs, bedrock and scree, deciduous forests, high elevations, and grass/forb/shrub habitats. The Aquatic Ecosystems section of the forest plan includes integrated plan components for animal species that are associated with aquatic and riparian habitats (see appendix 6 for a list of species and their key ecosystems and ecosystem characteristics).

5. In response to comments, discussions of travel routes and areas have been clarified in the final EIS. The forest plan considered motorized routes and areas in its mapping and analysis of the recreational opportunity spectrum, routes and areas suitable for motorized over-snow vehicle use, and analysis of secure core habitat that forms the basis of standards in the Infrastructure section of the plan. These routes and areas are analyzed in the relevant final EIS sections and are depicted in multiple ways on multiple maps in the EIS (e.g., figures 1-14 through 1-30, 1-31 through 35, 1-38 through 49, 1-52 through 59, and 1-73).

6. The forest plan's desired conditions, standards, guidelines, management areas, suitability, and objectives are sufficient to address wildlife habitat connectivity in multiple ways and at multiple scales. For clarity, section 3.7.6 was added to the final EIS to summarize effects on connectivity that were addressed throughout the wildlife sections of the draft EIS. For example, although the Forest does not have an explicitly recognized management area with a connectivity management emphasis, management area 1a (wilderness) and management area 1b (recommended wilderness) provide habitat connectivity for species that are sensitive to some types of human disturbance because these management areas are not suitable for motorized use or mechanized transport. As discussed in the final EIS, alternative B modified also addresses connectivity through the vast network of riparian management zones (see FW-STD-RMZ-01 and figure 1-07) and associated plan components (e.g., FW-GDL-RMZ-01, 08 through 15). Although the Forest does not have management authority over highways, key highway crossing areas for NFS lands are identified in guideline FW-GDL-IFS-12. Key areas for connectivity are also identified in figure B-54 and are referenced in desired conditions in the geographic area (GA) sections of the forest plan (including but not limited to the Salish demographic connectivity area for grizzly bears). Desired conditions to coordinate with other land owners are included in the Partnerships and Coordination section of the plan, and desired conditions for land ownership adjustments and conservation easements are included in the Lands and Special Uses section. In its entirety, the forest plan provides for connectivity and wildlife diversity and contributes to viable populations of at-risk species while also being adaptive to changing conditions. See also the comments and responses under Wildlife—Lynx Connectivity, Wildlife—Modeling and Managing Connectivity, and Alternatives—Wildlife Connectivity Effects).

7. In response to comments, the Forest primarily refers to species such as elk and deer as “ungulates” but also refers to them as “big game species” to acknowledge that this group of species can be legally hunted in the state of Montana.

Wildlife—At-Risk Species Plan Components

Comment (letter numbers 108, 2904, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Plan components for at-risk species (species of conservation concern and federally protected species) should be standards because proposed plan components are not sufficient to provide the ecological conditions that will maintain viable populations. Persistence of the black swift,

harlequin duck, and Townsend's big-eared bat depends on developing enforceable standards that limit human disturbance.

2. The EIS discussion of effects of plan components that may not support the maintenance or restoration of ecological conditions needed for particular species should be improved. For example, proposed timber harvesting and vegetation treatments, such as thinning, may adversely affect harlequin duck nesting habitat.

Response

1. According to the definitions in the 2012 planning rule, all plan components are "enforceable." Project and activity decisionmaking must be consistent with applicable plan components, whether a desired condition or a standard (see the "Project and activity consistency with the forest plan" section of chapter 1 of the forest plan). Desired conditions outline the conditions to strive for to meet the requirements of Forest Service Handbook 219.9. A standard or guideline does not compel an action to take place—it prescribes the manner of carrying out an action. Standards and guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iv)).

The planning rule at 36 CFR 219.15(d) defines how on-the-ground projects must be consistent with the land management plan. This section of the planning rule states that "every project and activity must be consistent with the applicable plan components." The rule then further defines what it means to be "consistent" with the various plan components. For goals, desired conditions, and objectives, "The project or activity contributes to the maintenance or attainment of one or more goals, desired conditions, or objectives, or does not foreclose the opportunity to maintain or achieve any goals, desired conditions, or objectives over the long term." For standards, "The project or activity complies with applicable standards." For guidelines, the project or activity "complies with applicable guidelines as set out in the plan" or "is designed in a way that is as effective in achieving the purpose of the applicable guidelines." As stated in chapter 1 of the forest plan, a guideline is a constraint on project and activity decisionmaking that allows for departure from its terms, so long as the purpose of the guideline is met.

The forest plan contains specific desired conditions for the integrity of various ecosystems found on the Forest, which includes descriptions of the desired composition, structure, ecological processes, landscape structure and connectivity, and responses to various stressors. There are also specific desired conditions for the at-risk species on the Forest. The set of desired conditions in the forest plan outlines the conditions necessary to maintain or restore ecological integrity or the ecological conditions necessary to address the needs of the at-risk species. When a forest plan provides desired conditions and objectives to move the Forest towards certain ecological conditions or species habitat needs, those cannot be ignored.

In response to comments, plan components for wildlife were refined and clarified in alternative B modified. With respect to the specific species mentioned in the comment, alternative B modified includes desired conditions FW-DC-WL DIV-01, FW-DC-CAVES-01, 05, and 06 and guidelines FW-GDL-WL DIV-05 and FW-GDL-CAVES-01 and 03 that reduce the risk of human disturbance to wildlife, including the black swift, harlequin duck, and Townsend's big-eared bat.

2. For the final EIS, the Forest reviewed wildlife effects and provided additional discussion where needed. Effects to harlequin ducks are discussed in section 3.7.4 of the final EIS, subsection "Aquatic, wetland, and riparian habitats," under Harlequin duck. The EIS discusses effects of plan components that may not support the maintenance or restoration of ecological conditions

needed for species of conservation concern. For example, as stated in the harlequin duck section of section 3.7.4 of the final EIS, vegetation management along nesting stream reaches can be a key stressor that affects harlequin ducks. As a result, the Forest developed plan components to address this and other stressors. For example, FW-SUIT-RMZ-01 states that riparian management zones are *not* suitable for timber production but that timber harvesting for other multiple-use purposes is allowable. Plan components are designed to maintain, restore, or enhance habitat for riparian-associated species such as the harlequin duck (e.g., see desired condition FW-DC-WL DIV-01; standards FW-STD-RMZ-01 through 04 and 06; and guidelines FW-GDL-RMZ-01, 06, and 08 through 13; also see the response to comment 1 above).

In summary, the desired conditions and objectives provide the means for the Forest to take actions to create, enhance, or maintain the ecological conditions necessary for at-risk species. When it is necessary to provide limitations on how a project might be designed, then the appropriate standards and guidelines have been provided. In the future, if monitoring indicates plan components are not sufficient, the plan can be adjusted.

Wildlife—Beaver

Comment (letter number 2869)

The Forest should keep the desired condition that beavers play an important ecological role in creating and maintaining wetlands, but guideline 07 on page 20 of the draft plan should be changed to remove “. . . should be used prior to using more drastic measures (e.g., removing beavers or removing their dams).”

The forest plan should expand upon the list of non-lethal options for mitigating human-American beaver conflicts based upon Pollock et al. (2015).

The forest plan should build upon the consensus of the Northern Rockies Adaptation Partnership (and an extensive body of scientific literature) by adding new desired conditions, standards, and guidelines into the plan for the strategic management of beaver populations as a significant and positive climate adaptation tool.

American beavers should be listed as a focal species that will be monitored, given its key role in maintaining healthy, intact aquatic ecosystems.

Response

Desired condition FW-DC-WTR-14 was refined and clarified in the forest plan and now recognizes the importance of beavers as a climate adaptation tool. Watershed guideline FW-GDL-WTR-04 now states that when beaver dams are threatening infrastructure or impairing bull trout spawning, preferred techniques that sustain beavers (e.g., using pipes to reduce water levels, notching dams to restore fish passage) should be used. As stated in section 3.7.4, subsection “Wildlife associated with aquatic, wetland and riparian habitats,” under Beaver, maintaining beavers across the landscape helps to make aquatic ecosystems resilient in the face of anticipated future climates. Literature by Pollock et al. (2015) is cited in the final EIS and was used to inform the guideline to use preferred techniques that sustain beavers when dealing with situations where dams are threatening infrastructure or impairing bull trout spawning. The Forest did not list all of the techniques because it would be quite lengthy. The Forest did not list the beaver as a focal species, but the Forest has monitoring items designed to monitor the health of aquatic and riparian ecosystems (e.g., see MON-WTR-01 through 07 in chapter 5 of the forest plan).

Also see comments and responses under Monitoring—Wildlife.

Wildlife—Big Game Habitat

Comment (letter numbers 54, 187, 200, 201, 290, 2574, 2577, 2632, 2875, 2892, 2940, 2985, 2987, 2989, 3028, 3062, 3070, 3087)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

See also the comments and responses under Wildlife—Analysis Insufficient for a discussion of use of the terms “big game” and “ungulates.”

1. Tree cover standards for big game winter and summer range should be added to the forest plan. All big game winter range is in a timber management area (management area 6), whereas the existing forest plan has big game management areas that requires 50 percent winter thermal cover to be maintained on winter range for white-tailed deer.

The Forest should add a requirement for a minimum crown closure of approximately 70 percent.

The Forest should remove the criteria to retain a certain percentage of thermal cover or canopy cover to account for other ungulate needs, such as forage, in addition to snow intercept cover. Maintaining flexibility in management strategies that provide for all habitat needs may be beneficial over the long term; the Forest Service should collaborate with MFWP to evaluate individual timber and habitat management efforts as they arise.

The needs for winter thermal cover for elk and deer should to be analyzed site specifically at the project level, and guideline FW-GDL-TIMB-05 should either be made more general or removed.

2. The Forest should consider recent research that has emphasized the importance of summer elk habitat quality in relation to elk production and survival. As more site-specific research becomes available, the Forest Service should consider summer elk ranges when applying forest treatments.

3. The Forest should add forest plan components for protecting connectivity for ungulate species and their forage and security habitat. This group of species is an ecologically, economically, and culturally important component of the Forest.

Response

1. The use of habitat by elk and other ungulates is very site specific, based upon factors such as tree species, forest type, aspect, elevation, and precipitation (which changes as the climate changes). In alternative B modified, snow interception for big game species is addressed with desired conditions and guidelines, rather than standards, because the amount of crown closure that provides snow interception varies on a site-specific basis. These forestwide plan components apply in management area 6 as well as other management areas. Forestwide guideline FW-GDL-TIMB-05 was deleted in alternative B modified. Alternative B modified now includes forestwide guideline FW-GDL-WL DIV-01, which states that snow intercept cover in key big game winter habitats should be determined in cooperation with Montana Fish, Wildlife and Parks. Coordinating with Montana Fish, Wildlife and Parks provides for consideration of key areas where small groups of elk may occur.

2. Section 3.7.4 of the final EIS, subsection “Coniferous forest habitats,” under Forest ungulates, discusses the effects of alternatives on elk and their habitat during all seasons. In response to

comments, the Forest has refined and clarified statements about ungulate forage (including but not limited to elk and moose) in the forest plan under Ecosystem Processes—Fire, Forest Insects, and Disease and Landscape Pattern (see desired conditions under FW-DC-TE&V). The Forest reviewed new scientific information published in 2017 and forest biologists discussed its applicability with MFWP. Some studies were conducted in portions of Montana that have elk habitat that is very different from elk habitat in northwest Montana, so their findings are not applicable to northwest Montana. New research will be considered as it becomes available.

3. Sections 3.7.4 and 3.7.6 of the final EIS, subsection “Coniferous forest habitats,” “Forest ungulates,” addresses the effects of plan components related to forage, security habitat, and habitat connectivity for ungulates. Ungulates indirectly benefit from forestwide standards for grizzly bear habitat security in the primary conservation area. Outside the primary conservation area, big game habitat security is provided for by guideline GA-SM-GDL-01 and desired conditions GA-SM-DC-04 through 06 and standard GA-SM-STD-01. Suitability for motorized over-snow vehicle use is mapped for each alternative, and the effects of motorized over-snow vehicle use on ungulates are assessed in the final EIS, section 3.7.4. Future decisions must be consistent with suitability. For discussions of connectivity for multiple species, see Wildlife—Modeling and Managing Connectivity; Grizzly Bear Conservation Strategy—Connectivity; Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest; and Alternatives—Wildlife Connectivity Effects.

Wildlife—Black-Backed Woodpecker

Comment (letter numbers 2821, 2940)

The plan components for the black-backed woodpecker should be improved; the Forest’s management plan for black-backed woodpeckers going forward should be stated.

The Forest’s assessment of effects to black-backed woodpeckers should be based on peer-reviewed, best available science and not on literature reviews that have not been subjected to peer review. The Forest should discuss the effects of past fire management, including both fire suppression and fire prevention through thinning, on black-backed woodpeckers. The black-backed woodpecker and other snag-dependent species should be designated as focal species as indicator species for healthy, burned forests.

Response

The forest plan includes plan components that provide for black-backed woodpeckers and their habitat as well as for other species associated with burned forests. For example, forestwide desired conditions FW-DC-TE&V-25 and FS-DC-WL DIV-01 incorporate desired conditions for the black-backed woodpecker, standard FW-STD-TE&V-03 provides for retention of snags and/or live replacement trees within timber harvest areas, and guidelines FW-GDL-TIMB-01 through 03 provide for retention of burned trees in areas burned by wildfire when salvaging timber. Appendix C, section “Recently burned forest conditions,” also provides possible management strategies and approaches, recognizing the highly variable site conditions and management situations that can occur across the Forest that are most appropriately addressed at the project level.

Section 3.7.4 of the final EIS, subsection “Burned forest and dead tree habitats,” discusses effects to species associated with post-burn habitats, including a section on the black-backed woodpecker. This section has been refined and updated in the final EIS to consider the best available scientific information, including the effects of past fires and the effects of salvage

harvest in burn areas. As discussed in the EIS section 3.7.4 on wildlife, as well as in the affected environment sections of Fire and Fuels Management (section 3.8) and Vegetation—Terrestrial Ecosystems (section 3.3), the natural range of variation in the amount of burned forest is very large on the Forest, and modeling suggests that fire will continue to be a primary natural disturbance process into the future, particularly under a warmer climate (refer to section 3.3.2 and Trechsel (2017d)). Modeling for the black-backed woodpecker indicates that the Forest would stay within the natural range of variation for the next 50 years under all the alternatives (refer to the final EIS, appendix 3).

The responsible official considered the black-backed woodpecker for designation as a focal species or species of conservation concern. The spreadsheet documenting the rationale for all species considered for species of conservation concern status can be found at <https://www.fs.usda.gov/detail/r1/landmanagement/planning/?cid=fseprd500402>. The responsible official did not select the black-backed woodpecker or other snag-dependent species as a focal species, but the forest plan includes monitoring items for breeding birds (which includes snag-dependent species) and for burned forest habitat (MON-WL-13, 15; MON-TE&V-02).

Wildlife—Conservation Measures

Comment (letter number 290)

The forest plan should require that conservation strategies be developed for all management indicator species and sensitive species. This should include monitoring for species presence, not just habitat as proxy, in order to show a positive correlation between species populations and habitat.

Response

The 1982 planning rule established the concept of monitoring requirements for management indicator species. The 2012 rule did not perpetuate the use of management indicator species in planning but instead adopted the use and monitoring of focal species. Focal species are a small subset of species whose status permits inference of the integrity of the larger ecological system to which it belongs. Monitoring of focal species provides meaningful information regarding the effectiveness of the plan in maintaining or restoring ecological conditions to maintain the diversity of plant and animal communities in the plan area. Monitoring of focal species is linked to the requirement of § 219.9 of the 2012 planning rule, which describes the coarse-filter approach for providing diversity and integrity of plant and animal communities and persistence of native species in the plan area. Focal species monitoring is not intended to provide information about the persistence of any individual species. The rule does not require managing habitat conditions for focal species, nor does it confer a separate conservation requirement for these species simply because they were selected as focal species (see the preamble to the 2012 rule at 77 FR 68, pp. 21222-21223). Chapter 5 of the forest plan includes monitoring for the presence of some species (birds and mesocarnivores, for example) in conjunction with the USDA Forest Service Northern Region's broad-scale monitoring strategy.

Sensitive species were established under Forest Service Manual 2670, but when a forest plan is revised under the 2012 rule, sensitive species are replaced on that national forest by species of conservation concern. A species of conservation concern is a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area (the national forest) and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to

persist over the long term in the plan area. Available conservation strategies for species formerly designated as sensitive have been considered and integrated, as appropriate, into the plan components of the forest plan, supporting the biodiversity requirements of the 2012 planning rule.

Wildlife—Consultation

Comment (letter numbers 141, 2888, 2940, 2985, 3122)

The Forest should consult with the U.S. Fish and Wildlife Service and request a biological opinion to prevent jeopardy in accordance with the Endangered Species Act section 7 and to conserve grizzly bears in accordance with the Endangered Species Act section 7(a)(1). The Forest Service should collaborate with MFWP to evaluate individual timber and habitat management efforts as they arise. Montana Department of Natural Resources and Conservation has developed a habitat conservation plan and acquired an incidental take permit under section 10 of the Endangered Species Act for 550,000 acres in western Montana. The Forest should take these documents into account to effectively streamline section 7 consultation for road agreements.

Response

Section 7 consultation on the forest plan began with U.S. Fish and Wildlife Service participation in interagency meetings, followed by a formal consultation agreement in August 2016. Throughout the planning process, numerous meetings have been held to discuss development of the alternatives for the Flathead National Forest and the amendment forests, as well as their effects on federally listed species and designated critical habitat. Formal consultation was initiated with the Forest Service's submission of biological assessments to the USFWS on March 13 and March 17, 2017 (Kuennen, Van Eimeren, & Trechsel, 2017; Warren et al., 2017). The USFWS completed one biological opinion for the Flathead National Forest (USFWS, 2017b) and one for the amendment forests (USFWS, 2017a). The biological opinions address Endangered Species Act section 7(a)(2) regarding jeopardy, incidental take, and adverse modification, as well as Endangered Species Act section 7(a)(1) regarding conservation of endangered and threatened species.

Thank you for making the Forest aware that Montana Department of Natural Resources and Conservation has acquired an incidental take permit under section 10 of the Endangered Species Act. The forest plan does not make decisions on road agreements, timber projects, or habitat management efforts. The Forest will collaborate with MFWP and consider Montana Department of Natural Resources and Conservation's habitat conservation plan (MTDNRC, 2011) as appropriate when individual projects arise. The Forest Service is required to consult with the USFWS for road agreements under section 7 on a site-specific basis, as applicable.

Wildlife—Effects of Alternatives on Connectivity

Comment (letter numbers 2869, 2875, 2940, 3021)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Ecosystem Research Group's modeling of the effects of alternatives on wildlife (appendix 3 of the final EIS) was not available in the publicly released documents. Ecosystem Research Group should have modeled the effects of road density and human occupancy across alternatives. Ecosystem Research Group's approach to modeling forest cover does not adequately address functional connectivity because it fails to explicitly consider important aspects of species'

behavioral responses to landscape characteristics other than cover type (e.g., road density or topography).

2. Alternative C is the best management strategy for maintaining protected reserves as core areas free of human disturbance and maintaining populations of wildlife species (including mountain goats, grizzly bears, wolverines, and bull trout, to name a few) and as a critical component of management responses to climate change.

3. The following statement made in the draft EIS (vol. 1, p. 366) is not accurate: “within the Northern Rockies, natural, unavoidable disturbances such as wildfire, insect outbreaks, or disease make the benefits of permanent reserves more questionable.” The Forest should recognize the value of permanent reserves for connectivity.

Response

1. The Forest’s assessment of existing condition and trend, released to the public in April 2014, discussed and displayed maps of connectivity with respect to riparian areas (USDA, 2014a, figure 52), connectivity with respect to vegetation (figure 53), connectivity with respect to human developments (table 43 and figure 53), connectivity with respect to grizzly bear security core (figure 55), and large intact block least-cost corridors for forest specialists (figure 56). Modeling results for the effects of alternatives on vegetation and wildlife were made available to the public. The details of modeling were included in appendices 2 and 3 of the draft EIS and the final EIS, including Ecosystem Research Group’s modeling results (appendix 3). The modeling was also summarized throughout wildlife section 3.3 of the draft EIS and section 3.7 of the final EIS. The modeling makes projections for each alternative by decade, 50 years into the future.

The effects of roads were not included in Ecosystem Research Group’s modeling because the SIMPPLE model that provided the input to Ecosystem Research Group’s model is strictly a probabilistic vegetation model. However, the effects of roads on grizzly bears and habitat connectivity were accounted for and discussed extensively in the grizzly bear sections of the EIS. For example, figures 1-37 through 41 in volume 1 of the draft EIS and figures 1-38 to 1-41 in the final EIS display the effects of alternatives on areas that provide grizzly bear habitat security and connectivity of areas that are at least 2,500 acres in size and at least 500 meters from open or gated roads or motorized trails.

Some commenters suggested that the Forest should model the effects of alternatives using a model that addresses the spatial arrangement of forest cover in more detail than the information Ecosystem Research Group provided as indicators of connectivity (total area, percent forest habitat, and average patch size). They pointed out that a scenario in which forest habitat occurs in small patches distributed randomly versus habitat that occurs in a continuous, linear band across the forest has very different effects for wildlife. The Forest agrees that these two scenarios have very different effects on wildlife, but this kind of analysis is best addressed at the site-specific project level, where actual cover distribution can be assessed at a particular point in time. At the project level, the Forest is able to map and assess the existing cover condition that has resulted from past wildfire, timber harvest, and thinning in conjunction with the size and arrangement of specific proposed treatments. The Forest has the ability to discuss effects on wildlife in much more detail at the project level than is possible for a programmatic plan that uses a probabilistic model.

2. In developing the alternatives, the Forest sought to provide a range that is responsive to the purpose and need, addresses the issues identified during scoping, and portrays a range of effects.

The rationale for the plan components that were incorporated into each of the action alternatives, as well as the alternatives that were considered but not given detailed analysis, were presented in the draft EIS and updated in the final EIS (see chapter 2). The responsible official had a wide range of alternatives from which to choose (including alternatives for protected reserves such as recommended wilderness) and considered the effects on connectivity when determining the mix of land and resource uses that would best meet public and resource needs. The responsible official strived to provide for multiple uses and the proper management of all resources.

3. The Forest has clarified the statement quoted from the draft EIS (vol. 1, p. 366); see section 3.7.6 of the final EIS. Section 3.7.6 discusses the value of permanent reserves, such as wilderness, for connectivity with respect to human disturbance and clarifies that areas such as designated wilderness (management area 1a) are subject to natural disturbances that can result in temporary impacts on connectivity with respect to cover.

See also the comments and responses under Wildlife—Modeling and Managing Connectivity, Grizzly Bear Conservation Strategy—Connectivity, Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest.

Wildlife—Elk Habitat, Impacts of Roads and Trails

Comment (letter numbers 110, 162, 2770, 2985, 3075, 3155)

The Forest should manage road densities based on the elk-logging study guidelines (Lyon et al., 1985), especially in the Salish Mountains.

The plan should include a comprehensive approach for managing human activities to meet elk objectives, particularly all-terrain vehicle riding and mountain biking, which caused the largest reductions in feeding time and increases in travel time of elk, based upon a study by Naylor et al. (2009).

Response

Naylor et al. (2009) was considered in the final EIS (see section 3.7.4, subsection “Forest ungulates”). The Final Report of the Montana Cooperative Elk-Logging Study 1970-1985 (Lyon et al., 1985) is incorporated in alternative A. Under the action alternatives (B modified, C, and D), elk objectives are addressed directly and indirectly by desired conditions, standards, guidelines, objectives, suitability, and management areas. For example, desired conditions GA-SM-DC-04 through 06 and guideline GA-SM-GDL-01 for the Salish Mountains geographic area provide for elk habitat security. The Salish Mountains are included in grizzly bear management zone 1, where forest plan standard GA-SM-STD-01 applies to motorized access. Under alternative B modified, standard GA-SM-STD-01 would not allow the density of roads open to public motorized use to increase above baseline levels in the Salish Mountains and would not allow the density of motorized trails to increase above baseline levels in the Salish demographic connectivity area.

Road closures increase habitat security for elk and other wildlife species and increase nonmotorized hunting opportunities but decrease motorized hunting opportunities. The forest plan alternatives include a comprehensive approach to managing human activities to meet elk and other wildlife objectives while maintaining public access to contribute to social and economic sustainability. Standards FW-STD-IFS-02 and 03 also provide for management of motorized access (including use of off-highway vehicles), indirectly contributing to elk habitat security. Regarding mountain bikes, management areas 1a (designated wilderness) and 1b (recommended

wilderness) are not suitable for motorized use or mechanized transport (including mountain bikes) and would contribute to high levels of elk security on much of the Forest.

The responsible official strives to provide for multiple uses and proper management of all resources, considering ecological, social, and economic sustainability. As stated in section 3.7.4 of the final EIS, subsection “Coniferous forest habitat,” “Forest ungulates,” plan components in the preferred alternative, B modified, would continue to support elk objectives at a programmatic scale. Site-specific NEPA evaluations would also address big game species (e.g., elk, deer, moose).

Wildlife—Fisher Analysis

Comment (letter numbers 2888, 2940, 3021)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should take the required “hard look” at the effects of logging and other vegetative management directives, road construction and use, and livestock grazing on fisher. The draft EIS did not analyze the impacts from each alternative and how they would differ; rather, it provided a summary of the potential consequences from all action alternatives and then asserted that most impacts are beneficial or uncertain (draft EIS, vol. 1, pp. 383-384).

2. The Forest should better explain why Ecosystem Research Group’s model of fisher habitat “predicts declines that are likely a function of reduced canopy cover to levels below that which fishers require” (draft EIS, vol. 1, p. 383). The conclusion that plan components will support the persistence of fisher is not supported by the modeled analysis.

3. A comprehensive management scheme that provides for a variety of habitats in useable proximity to each other, as well as for connectivity, is the best management strategy for all species (including fisher, grizzly bear, and lynx). Directives to maintain old growth and prescriptions that will protect riparian zones will benefit the fisher, but meaningful desired conditions for riparian areas need to be added in order to have an objective to “improve” them.

The Forest should analyze whether a 300-foot strip of habitat (or 600-foot strip, which would be the total width on both sides of a perennial stream) is adequate for fisher for core habitat or connectivity purposes and should also analyze the spatial arrangement and gaps between these riparian management zones. It is not clear whether there are riparian management zones within 540 feet of each other continuously through the connectivity areas.

Response

1. Taking a “hard look” at the effects of the forest plan for the Forest includes a discussion of scientific uncertainty, a discussion of potential beneficial and detrimental effects, a relative comparison of alternatives, and a discussion of plan components designed to eliminate, reduce, or mitigate detrimental effects. The EIS takes just such a “hard look” at the potential effects of each alternative on fisher. Key stressors that may occur in fisher habitat are addressed in section 3.7.4 of the final EIS, subsection “Old-growth forest, very large live tree habitat, and very large dead tree habitat,” under “fisher.” There is no scientific evidence that livestock grazing is a key stressor for fisher on the Forest. In the final EIS, the Forest has refined and clarified the discussion related to old-growth forest and old-growth habitat, potential vegetation management, road construction,

and road use activities in relation to fisher. Section 3.3.7 of the final EIS also discusses the effects of the alternatives on old-growth forest.

2. In response to comments, Ecosystem Research Group's modeling has been clarified in the final EIS (see final EIS, appendix 3, for details). With respect to future habitat conditions, the Forest has disclosed its assumptions as well as the uncertainty about what may occur in the future. Predictions of reduced canopy are based on modeling of what the Forest believes is a "worst-case scenario" for the effects of anticipated future climate and the indirect effects it may have on wildfire, insects, and disease. As stated in the final EIS, appendices 2 and 3, the timing and intensity of these effects is uncertain because they are projected for 50 years into the future.

Regarding fisher persistence, the forest plan provides a comprehensive management scheme that would provide ecological conditions to maintain the diversity of all species, within the capability of the land and within Forest Service authority, including but not limited to the fisher. The draft EIS and the final EIS acknowledge that there may be minor effects on fisher habitat due to fuel treatment projects in portions of the wildland-urban interface. As discussed on pages 382-385 of the draft EIS and in section 3.7 of the final EIS, forestwide standards and guidelines for Canada lynx, grizzly bear, old-growth forest, snags, downed wood, and riparian management zones provide for fisher habitat and limit potential detrimental effects while allowing vegetation management treatments that have beneficial effects. Sauder and Rachlow (2014) stated that, in their Idaho study area, higher-quality fisher habitat occurs in multiple-use landscapes than in wilderness landscapes. Forest plans are intended to be adaptive, so the plan can be revised or amended in the future if needed.

3. Managing for fisher habitat can be compatible with timber harvest and other types of vegetation management. Areas of the Rocky Mountains currently occupied by fisher are managed for multiple uses. Sauder and Rachlow (2014) characterized high-quality fisher habitat as a variety of habitat patches to support prey species within a matrix of mature forest arranged in connected, complex shapes and with few isolated patches (Sauder & Rachlow, 2014). Sauder (2014) found that within their home ranges, fishers select areas as core use zones that have relatively high fine-scale habitat heterogeneity, supporting the hypothesis that fishers establish home ranges that provide access to a greater diversity and abundance of prey species while still attaining access to habitat features that are important for reproduction and thermoregulation, such as very large snags, downed woody material, and cover. These characteristics have been incorporated into desired condition FW-DC-WL DIV-01 describing ecological conditions of fisher habitat as well as plan components for riparian areas, old growth, snags, downed woody material, and habitat connectivity. For example, see desired conditions FW-DC-RMZ-03 through 06; guidelines FW-GDL-RMZ-08 through 10; old growth and landscape pattern desired conditions FW-DC-TE&V-14 and 19; vegetation standards FW-STD-TE&V-01 through 03; and vegetation guidelines FW-GDL-TE&V-06 through 09.

Desired conditions for riparian management zones were refined in the forest plan to more specifically address forest composition and structure, now including habitat components such as snags, downed logs, and cover patches—components of the forest structure that would benefit fisher. As shown in the final EIS, figure 1-07, riparian management zones are abundant and are well distributed across the Forest. The riparian management zone plan components would be sufficient to contribute to habitat connectivity for fisher, based upon the best available scientific information. One commenter stated that they do not know whether there are riparian management zones within 540 feet of each other continuously through the connectivity areas. The commenter did not cite science supporting the significance of a distance of 540 feet to fisher, so the Forest is

unable to respond fully to this comment. However, the forest plan includes forestwide guideline FW-GDL-RMZ-09, which applies to the entire riparian management zone and limits the distance to cover in new openings created in riparian management zones through even-aged regeneration harvest or fuel reduction activities. The distance to cover in this guideline was based upon Canada lynx (Squires et al., 2010) but would also provide reasonable assurance that habitat connectivity is provided for other species such as fisher and marten. GIS examination of modeled fisher habitat (Olson et al., 2014) overlaid with riparian management zones shows that there is a large overlap in these two habitats on the Forest. As stated in the fisher subsection of section 3.7.4 of the final EIS, the specific width of areas and the amount of cover that provides habitat connectivity for fisher is unknown.

Wildlife—Forest Plan Components

Comment (letter numbers 108, 2574, 2816, 2875, 2940, 3021)

Note: The Forest received many comments related to particular plan components for wildlife. Responses under this area of concern are located immediately after each specific comment.

FW_GDL_WL-01 and 02: Both of these guidelines should be upgraded to standards. **Response:** The food/wildlife attractant storage special orders required by FW-STD-WL-02, in conjunction with these two guidelines, provide sufficient management direction because the orders apply to all users on NFS lands and a guideline must be followed unless its intent can be met using other means. Therefore, another standard is not needed.

FW-STD WL-01 and 02: Are these necessary as standards since there are other commitments that require the application of these management approaches? **Response:** These standards are necessary to provide clarity. Under the existing plan, the grizzly bear recovery zone was divided into management situations 1, 2 and 3. Standard 01 makes it clear that these management situations no longer apply and that the management direction in the forest plan applies to the recovery zone/primary conservation area and/or to zone 1. Standard 02 makes it clear that the food/wildlife attractant storage orders apply whether the grizzly bear is delisted or not.

FW-GDL-WL SOI-05: On top of the riparian management zone buffers, will there be buffers of unknown width along all harvest units and fires? How long must management be precluded in these buffers? What if a buffer ceases to be effective due to natural successional or existing conditions do not provide buffering? These acres need to be managed as well to ensure they provide the benefit wanted. **Response:** FW-GDL-WL SOI-05 was refined and clarified in the forest plan and is now listed as FW-GDL-WL DIV-06. The guideline does not mean that there will be a buffer around all harvest units and fires. For example, connectivity would not be severed if there was cover providing connectivity on one side of a harvest unit or fire. Riparian management zone plan components are also refined and clarified in the forest plan. The Forest specified a distance to cover for openings created by vegetation management activities in guideline FW-GDL-RMZ-09, which is informed by scientific information (see Kuennen, 2017b).

FW-STD-TIMB-07: This standard needs to take into account existing and newly created openings on both NFS lands and adjacent private and other agency lands. Wildlife does not recognize the change from agency to Flathead National Forest to private land, which means the 40-acre opening needs to apply to all projects and take into account all previous and potential future projects. **Response:** Cumulative effects of openings on wildlife are assessed site-specifically at the project level.

GA-SM-STD-01: In bullet point #2, as with forestwide management, the standard for geographic areas needs to implement alternative C management for grizzly bears and *not* allow the temporary opening of roads (whether in the primary conservation area, zone 1 or the Salish demographic connectivity area) to the public. The Flathead National Forest needs to delete bullet number 2 as an exception to GA-SM-STD-01. **Response:** Under alternative B modified, FW-STD-IFS-04 was clarified and refined (similar to alternative C) so that roads in secure core in the primary conservation area will not be temporarily opened to the public. This will provide a higher level of habitat security for the grizzly bear in the recovery zone/primary conservation area. Temporarily opening a road to allow for public firewood gathering and other authorized uses for a short period of time occurred outside of security core areas and in zone 1 during the time period when the grizzly bear population was growing and expanding its distribution and could continue under alternative B modified.

GA-SM-DC-02: It is not clear what happened to GA-SM-DC-02 from the proposed action (Proposed Action, p. 123). **Response:** This desired condition is now GA-SM-MA7-Big Mtn-DC-04. This desired condition was refined and clarified in the forest plan.

GA-SV-DC-09: Guidelines and standards should be developed for the geographic areas that give clearer management direction to conserve areas important for ecological connectivity. **Response:** Desired conditions outline the conditions to strive for to meet the requirements of Forest Service Handbook 219.9, with standards and guidelines identified if they are needed to provide sideboards to the projects being designed to meet those desired conditions. Often, the “sideboards” that are needed vary because of site-specific situations and are therefore best identified at the project level. It is through this series of “staged decisionmaking” that the management requirements necessary to meet the ecological integrity and species-specific requirements of Forest Service Handbook 219.9 are addressed. It is most appropriate to assess and manage some aspects of connectivity at the project level because what is needed to achieve desired conditions varies over time and across the Forest, depending upon site-specific existing conditions, the species being considered, and the nature of the proposed action. Also see the comments and responses under Grizzly-Habitat Connectivity; Wildlife—Modeling and Managing Connectivity; Grizzly Bear Conservation Strategy—Connectivity; Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest; and Alternatives—Wildlife Connectivity Effects.

GA-SM-DC-03, GA-HH-DC-03: These desired conditions are a good start, but the Flathead National Forest needs to take this one step further and add GA-HH-OBJ-01 to acquire one or more parcels and/or provide one or more easements for wildlife crossings. **Response:** Montana Department of Transportation is already reconstructing U.S. Highway 2 in this area. Because their plan addresses wildlife crossings in the Hungry Horse geographic area, the Forest did not include a geographic area plan component for this geographic area. Objectives GA-MF-OBJ-01 and GA-SM-OBJ-04 are now included in the forest plan, addressing priority areas for acquisitions or easements for future wildlife crossings.

FW-DC-LSU-01: The discussion of FW-DC-LSU-01 within the draft EIS refers to key connectivity areas. Are these key connectivity areas recognized within the forest plan and EIS? **Response:** Key areas are identified in figure B-54 and also in guideline FW-GDL-IFS-12 of the forest plan.

FW-GDL-IFS-13: Plan component FW-GDL-IFS-13 encourages cooperation in implementing crossing designs that contribute to wildlife connectivity. The areas specifically identified as being important for wildlife connectivity should also be designated as management areas. **Response:** See Grizzly Bear—Habitat Connectivity; Wildlife—Modeling and Managing Connectivity,

Grizzly Bear Conservation Strategy—Connectivity; and Grizzly Bear—Connectivity, Site-Specific, Flathead National Forest.

FW-DC-P&C-01: This desired condition addresses cooperation with other land managers to provide for connectivity; the likelihood that this condition will be achieved would be enhanced if priority areas for connectivity cooperation were recognized within the forest plan. Objectives for connectivity within these areas, as well as plan components to protect a connected condition, would be beneficial. **Response:** Priority areas for connectivity are identified in figure B-54 and also in guideline FW-GDL-IFS-12 of the forest plan. The forest plan includes objectives GA-MF-OBJ-01 and GA-SM-OBJ-04 that address some of these key areas.

GA-MF-DC-06, GA-NF-DC-07, GA-SM-DC-03 and GA-SV-DC-09: It is not apparent that other plan components exist to ensure that connectivity is provided, nor does the desired condition meet the definition provided in the 2012 planning rule. The desired connectivity condition must be described in terms that are specific enough to allow progress toward their achievement to be determined (36 CFR 219.7(e)(1)(i)). Specific objectives for enhancing connectivity in these areas, such as for the reduction of road densities and the removal of roads that do not contribute to connectivity, should be considered. As a general matter, decommissioning of roads to contribute to structural and functional connectivity should be considered along with the other factors referenced in FW-OBJ-IFS-01. **Response:** As the commenter pointed out, there is not one desired connectivity condition that can be described in a desired condition. Desired conditions, standards, guidelines, objectives, and management areas throughout the plan contribute to various aspects of connectivity and are specific enough to allow progress towards their achievement to be determined (e.g., distance to cover in riparian management zones, motorized access density miles or percentages, acres in management areas for wilderness or recommended wilderness). The forest plan has two specific objectives for enhancing connectivity by decommissioning roads or placing them into intermittent stored service: FW-OBJ-IFS-01 and GA-SV-OBJ-04. Additionally, monitoring items for the NCDE will allow progress towards the achievement of associated plan components to be determined.

Plan components for the action alternatives would (1) reduce protection of watersheds and riparian areas by switching from watershed-scale to project-scale analysis to allow logging in riparian buffers, (2) eliminate riparian management objectives that had numeric standards for water temperature, pool frequency, large woody debris, bank stability, lower bank angle, and width/depth ratio, (3) eliminate current riparian and big game winter range management areas, etc., in favor of timber management areas, and (4) contain no clear plan for maintaining, recruiting, and connecting old-growth forest habitat. **Response:** The forest plan does not switch from watershed-scale to project-scale analysis—it addresses both scales. The conservation watershed network and priority watersheds under the watershed condition framework can be found in appendix E, which goes into more depth regarding strategies to protect and restore native fish and water quality. Additionally, appendix C contains possible management approaches or strategies for implementation of plan components at the project level. The final EIS explains why the action alternatives no longer use riparian management objectives (also see the comments and responses under Riparian Management Zone—Wetland Buffer and Aquatics—Riparian Management Objectives). Although the preferred alternative eliminates riparian and big game winter range management areas, it has other plan components that address big game winter habitat and riparian habitat (see also the comments and responses under Wildlife—Big Game Habitat and (Kuennen, 2017b)). Desired conditions FW-DC-WL DIV-01 and FW-DC-TE&V-14 through 17 address desired conditions to recruit and connect old-growth forest and/or components of old-growth habitat, such as very large live trees and snags. Standard FW-STD-TE&V-01

addresses maintaining old-growth forest, and guideline FW-GDL-TE&V-06 addresses increasing its patch size.

Table 18 should be renamed “Key habitats and key time periods for species known to be sensitive to human disturbance,” as this is a much more accurate representation of the state of scientific knowledge in the published literature. **Response:** Table 18 (now table 15) is named “Key habitats and key time periods for select species” to reflect the fact that all individuals of species in the table are not sensitive to all kinds of human activities and that this can vary on a site-specific basis.

Wildlife—Habitat, Active Management

Comment (letter numbers 109, 128, 135, 166, 186, 297, 2574, 2610, 2767, 2807, 2836, 3051, 3097, 3188, 3266, 3299)

Active management benefits wildlife; the forest plan should not be so restrictive that active management is not possible. Limitations on logging, road building, and stream degradation are necessary because these activities degrade or destroy wildlife habitat. Areas should be permanently set aside for wildlife to prevent conflict with people, including lower-elevation areas that receive larger amounts of traffic and timber harvest.

Response

The responsible official carefully considered a range of management area allocations to determine the mix of land and resource uses that would best meet public and resource needs. The alternatives include management areas where active management, including timber harvest and road building, is expected to occur (e. g., management areas 6b and 6c, management area 4, some management area 7 areas) as well as management areas where commercial timber harvest and roadbuilding would not be allowed (e.g., management areas 1a and 1b). Management areas 1a and 1b include low-elevation as well as high-elevation areas. The responsible official considered all points of view in making his decision. He strived to provide for multiple uses and proper management of all resources, including wildlife species and their habitats.

Wildlife—Habitat, Site-Specific

Comment (letter numbers 20, 54, 108, 233, 2610, 2777, 2984, 3075, 3084, 3268)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should add the Bunker Creek and upper Sullivan Creek area to the Bob Marshall Wilderness to help ensure Montana has robust wildlife 50 years from now.
2. The Forest should add to the Mission Mountains Wilderness to protect the species-rich lands that are adjacent to it, including the Sunset Ridge wildlife corridor and the bull trout spawning beds of Elk, Hemlock, Piper, and Fatty Creeks.
3. Quintonkon Road should be closed to enhance wildlife security between the Jewel Basin and the Sixmile-Sullivan-Bunker corridor.
4. The mileage of roads should be reduced on the Tally Lake Ranger District, Salish Mountains geographic area.

Response

The responsible official carefully considered a range of management area allocations to determine the mix of land and resource uses that would best meet public and resource needs.

1. There are a range of alternatives for management area allocations in Bunker Creek and upper Sullivan Creek. The preferred alternative, B modified, includes additional lands in Bunker Creek allocated to recommended wilderness (management area 1b), but upper Sullivan Creek has lands allocated to various backcountry management areas (management area 5).
2. There are a range of alternatives for management area allocations in the Sunset Ridge area and Elk, Hemlock, Piper, and Fatty Creeks. The preferred alternative, B modified, allocates additional lands in Elk Creek to management area 1b (recommended wilderness), but lands in Hemlock, Piper, and Fatty Creeks and portions of the Sunset Ridge area have various backcountry designations (management area 5). The responsible official decided to include a portion of the Sunset Ridge area as management area 6a in the preferred alternative to provide for wildlife habitat connectivity.
3. The forest plan does not authorize site-specific prohibitions or activities; rather, it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures. For example, site-specific analysis in compliance with the National Environmental Policy Act will need to be conducted in order for prohibitions or activities to take place on the ground, in compliance with the broader direction of the forest plan. Decisions on the management of specific roads occur at the project level.
4. There are a range of alternatives for the Salish Mountains geographic area. The preferred alternative, B modified, includes standard GA-SM-STD-01, which requires no net increase in the density of roads open to public motorized use on the Tally Lake District, after considering wildlife, the mix of multiple uses across the Forest, and the overall effect on motorized or mechanized users. Guideline GA-SM-GDL-01 also addresses habitat security in the Salish Mountains geographic area. Alternative B modified includes objective FW-OBJ-IFS-01 to decommission or place into intermittent stored service an additional 30-60 miles of road; some of this may occur on the Tally Lake Ranger District, as determined by site-specific analysis.

Wildlife—Impacts on Lynx from Motorized Access

Comment (letter numbers 51, 290, 2869, 2904, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The forest plan and final EIS should be improved to better address effects of winter recreation on Canada lynx. Late-season snowmobiling should not be permitted. Dramatic increases in snowmobile use present significant threats to lynx, increasing mortality directly at the individual level while contributing to habitat disruption and degradation at the population level. Snow compaction from snowmobiles increases competition for snowshoe hares by other predators, killings of lynx by coyotes and other predators, shooting and trapping, and risk from human interaction.
2. Multiple, cumulative impacts of climate change and snowmobile use should be analyzed, including increased traffic to new areas proposed for designation as suitable for motorized over-

snow vehicle use, especially in designated critical habitat, in alternatives B and D. The Forest should address the effects of both motorized and nonmotorized trails on Canada lynx.

Response

1. The Canada Lynx Conservation Assessment and Strategy (ILBT, 2013) assigned recreation and forest/backcountry roads to the lower tier of anthropogenic influences, indicating that they are “judged to have less impact on lynx and lynx habitat or are the responsibility of agencies other than the federal land management agencies. Regulations that are already in place may have reduced the impacts on lynx, or the nature of the activity confers a lesser impact” (ILBT, 2013, p. 78).

The Forest is not aware of scientific evidence that snowmobiling, late-season snowmobiling, or nonmotorized winter recreation on the Forest is a significant threat to Canada lynx populations. As stated in the Canada Lynx Conservation and Assessment Strategy (ILBT, 2013, p. 59), the effect of snowmobiles on competition with other predators is not a significant factor in the Northern Rocky Mountains Geographic Area: “Lynx did not appear to avoid forest roads or groomed snowmobile routes, and snow penetrability did not appear to be a factor in selecting travel routes or capturing prey (Squires et al. 2010).” The Canada Lynx Conservation and Assessment Strategy also states:

- In Montana, Kolbe et al. (2007) snow-tracked coyotes and found that although they did use snowmobile trails, they did not travel closer to these trails than randomly expected. Rather, coyotes adapted to deep snow conditions by selectively using habitats with shallower and more supportive snow (Bunnell et al. 2006, Kolbe et al. 2007), corroborating observations made by others (Murray and Boutin 1991, Crete and Lariviere 2003, Thibault and Ouellet 2005, Burghardt-Dowd 2010).
- Further, coyotes in the Kolbe et al. (2007) study did not use compacted roads any more than uncompacted roads, suggesting that coyotes may have used roads because they provide a “cleared travel corridor” whether they are compacted or not. The seemingly contradictory results from Kolbe et al. (2007) and Burghardt-Dowd (2010) might be attributable to differences in snow penetrability between the two geographic areas. Average snow penetrability measured using the same method was higher in northwestern Wyoming (Burghardt-Dowd 2010) than in Montana (Kolbe et al. 2007), making coyote movement in the absence of artificially compacted snow potentially more energetically costly in Wyoming. (p. 81)

As cited in the biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017), the Forest discussed the effects of roads and motorized over-snow vehicle use with John Squires, and he concurred that Kolbe et al. (2007) is the best available scientific information for the area of the Flathead National Forest. Section 3.7.5 of the final EIS, subsection “Canada lynx,” discusses existing conditions and effects of alternatives with respect to winter recreation and the indirect effects of snowmobiles on access for trapping. The cumulative effects of climate change and recreational activities are also discussed in this section.

The Forest is not aware of scientific evidence that snowmobile use affects denning lynx in northwest Montana. Lynx occupy dens in early May when many forest roads are still impassable to wheeled vehicles due to persistent snowdrifts and wet, muddy roads and snowmobiles no longer use the roads because of intermittent and unpredictable availability of sufficient snow (Squires, DeCesare, Kolbe, & Ruggiero, 2008). Squires and others (2010) concluded that lynx did not avoid the subset of roads that were open to wheeled vehicle travel.

2. Section 3.7.5 of the final EIS discusses the effects of future climate on Canada lynx. The Forest knows of no science predicting that snow levels on the Forest will decrease over the anticipated 15-year life of the plan. Projections of decreasing snow apply to the mid- to-late-century time period. As pointed out in the final EIS, climate models have much higher uncertainty about future precipitation than temperature, but projections for precipitation suggest that seasonal precipitation is projected to be slightly wetter in winter and spring. There may be more snow at high elevations and less snow at the lowest elevations in northwest Montana, but specific elevations are unknown.

Wildlife—Loon Program

Comment (letter number 3042)

The forest plan should support management efforts for loons, including plan components for loon education and monitoring.

Response

The forest plan includes plan components designed to sustain ecological conditions for loons, including forestwide desired conditions FW-DC-WL DIV-01 and 02, objective FW-OBJ-WL DIV-01, and guideline FW-GDL-WL DIV-05. Chapter 5 of the forest plan includes monitoring item MON-WL-07 for loons.

Wildlife—Lynx Connectivity

Comment (letter number 29004)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The forest plan should take a landscape-scale approach that ignores administrative, political, and Forest Service boundaries to identify and protect corridors, habitat linkage zones, and “least-cost paths” that help connect the local populations in the Flathead with populations in Canada to ensure the recovery of the species on the Forest. The best available science, including Squires (2013), should be reviewed; this shows two key lynx corridors for the connectivity of lynx from Canada to the northern Rockies on the Forest. These corridors need to contain dense, high canopy cover, over 60 percent. Information on lynx connectivity should be updated to reflect changes in lynx habitat, movement, trend, and status.

2. The final EIS should analyze how the forest plan directly, indirectly, or cumulatively impacts connectivity for lynx on the Forest, including treatments inside the wildland-urban interface.

Response

1. Connectivity for lynx, including all lands, is discussed in section 3.7.5 of the final EIS, subsections “Canada lynx” and Canada lynx critical habitat.” As stated in the final EIS, all alternatives include plan components, including standards and guidelines, for Canada lynx habitat connectivity (e.g., see standards ALL S1 and LINK S1 and guideline ALL G1 in appendix A of the forest plan). Plan components will be applied at the project level so that changes in lynx habitat, trend, and status are considered when conducting activities such as timber harvest or fuels treatments in the wildland-urban interface. As stated in the Canada lynx subsection of section 3.7.5 of the final EIS, the Forest reviewed Squires (2013), described his primary corridors, and used his model to inform and analyze the effects of plan components. For example, Squires

provided the Forest with his data so that the Forest could overlay his travel corridors with its other GIS layers, and this information was analyzed as part of the Forest's wilderness evaluation. In addition, the biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) and final EIS include a more detailed discussion of management areas along the putative travel corridors identified by Squires and others (2013). Connectivity with Canada is discussed in the Canada lynx subsection of section 3.7.5 of the final EIS; there is no evidence of genetic isolation of Canada lynx populations in western Montana (M. K. Schwartz, Mills, McKelvey, Ruggiero, & Allendorf, 2002). The Forest's assessment (USDA, 2014a, pp. 137-145) provided a discussion and maps of the existing condition and trends for connectivity for all lands related to numerous aspects, including (1) connectivity of riparian habitat conservation areas, (2) connectivity of current vegetation (specifically mentioning Canada lynx), (3) connectivity and human developments, and (4) connectivity and least-cost corridors for forest specialists (including lynx). In the Forest's assessment, the Forest displayed connectivity at a forestwide scale, including all lands, and discussed the impact that large wildfires have had on connectivity of cover on the Forest. The MFWP map of least-cost corridors also displays connectivity between the Flathead National Forest and surrounding lands.

Also see the comments and responses under Canada Lynx—Vegetation Management and Canada Lynx—Lynx Trapping.

2. The Forest's biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) and the final EIS discuss how the forest plan indirectly and cumulatively impacts connectivity for lynx on the Forest, including treatments inside the wildland-urban interface.

Wildlife—Marten

Comment (letter numbers 6, 324, 900, 2888, 2905, 3202, 3255, 3289, 2888, 3021)

The forest plan and draft EIS analysis of effects to marten should be improved. The Forest should add a standard or guideline to limit the size, location, or dispersion of forest gaps to inform project-level planning and meet the planning rule requirements because marten require denser forest stands.

The Forest Service discussion of benefits to marten from timber harvest, commercial and pre-commercial thinning, wildfire, insects and disease, and prescribed burning (draft EIS, vol. 1, p. 365) conflicts with statements that marten avoid open areas, generally prefer patches of forest greater than at least 40 acres (p. 364), that they are strongly associated with moderate to high canopy cover with forest interior conditions to help them avoid predators (p. 367), and that a modeled future increase in fire, insects, and disease would result in a decline in marten habitat (p. 365). By making statements such as "it is not possible to predict exactly where or when wildfires insect infestations or disease would occur" (p. 369), the Forest is making excuses for not fully analyzing the impacts of what is known about the activities proposed under each alternative.

Response

The Forest assessed the effects of the forest plan alternatives, which are programmatic in nature, considering the potential for beneficial effects, detrimental effects, and plan components designed to eliminate, reduce, or mitigate detrimental effects. In the section on marten in section 3.7.4, subsection "Coniferous forest habitats," the Forest acknowledges that land management (including timber harvest) can reduce cover and habitat connectivity for marten. However, as explained in the EIS, there are standards and guidelines for Canada lynx to maintain habitat with dense horizontal cover (e.g., VEG S1, VEG S2, VEG S5, VEG S6, VEG G1, VEG G10, and VEG

G11) that also benefit marten by providing habitat for foraging, denning, and cover to avoid predation. Canada lynx standards apply to about 1.8 million acres of lynx habitat distributed across the Forest; this contributes to marten habitat across a very large area because the habitats of these two species overlap. In addition, standards and guidelines for old growth, snags, and downed wood (e.g., FW-STD-TE&V-01 and 03, FW-GDL-TE&V-06 through 09) provide for complex structure to support marten habitat and its connectivity (including the subnivean foraging habitat of marten), both within and outside of timber harvest areas. Riparian management zone desired conditions, standards, and guidelines (e.g., FW-STD-RMZ-01 and 06, FW-GDL-RMZ-01, 08, 09, 10, and 12 through 15) also provide for marten habitat and its connectivity. In summary, plan components under alternative B modified are sufficient to provide for ecological conditions that support marten, and thus specific standards for marten are not necessary.

With respect to future habitat conditions, the Forest has disclosed its assumptions as well as uncertainty about what may occur in the future. Ecosystem Research Group modeled what the Forest believes is a “worst-case scenario” for the combined effects of multiple activities projected over a 50-year future time period (well beyond the expected 15-year life of the forest plan) and discussed potential effects on marten and marten habitat connectivity. The model incorporates the combined effects of timber harvest, prescribed burning, and thinning for the alternatives, in combination with projections of a warmer, drier summer climate and the resulting anticipated increases in wildfire, insects, and disease. The results of modeling are disclosed in the EIS section for marten as well as for other species. Although habitat is projected to decline over a 50-year time period, all alternatives would maintain marten habitat within the natural range of variation (explained in detail in appendices 2 and 3). The climate has been changing for decades, and the anticipated effects are based upon the current best available scientific information as well as models projecting what may occur. The Forest has conducted non-invasive sampling for multiple mesocarnivore species, and marten are regularly detected in numerous locations distributed across the Forest (Curry et al., 2016; Pilgrim, 2007-2012; Pilgrim & Schwartz, 2015; SWCC, 2014, 2015). USDA Forest Service Northern Region is developing a broadscale monitoring strategy for mesocarnivores, and Forest-level monitoring of mesocarnivores (including marten) will be conducted in conjunction with this broadscale monitoring program (see MON-WL-17). As detailed in chapter 5 of the forest plan, the Forest will also monitor changes in vegetation conditions that provide marten habitat (see MON-TE&V-01 through 05, and MON-WL-04 and 10 through 13).

Wildlife—Modeling and Managing Connectivity

Comment (letter numbers 20, 29, 62, 191, 323, 2630, 2836, 2852, 2856, 2869, 2875, 2879, 2901, 2983, 3021, 3063, 3084, 3116, 3155)

The Forest’s approach to connectivity needs to be improved.

It is helpful to have connectivity models incorporated into the draft EIS (in appendix 3, section 2.5.10, pages 26-27, and figure 2) pursuant to the 2012 planning rule’s requirement to take into account how forests fit into the “broader landscape influenced by the plan area” with respect to connectivity (36 CFR 219.8(a)(1)(iii)). Connectivity in particular areas of the Forest needs to be addressed better.

The Forest should use particular models for identification and assessment of linkage zones, corridors, and key connectivity areas. The Forest should use Belote et al. (2016) as best available scientific information for connectivity.

The Forest's approach to modeling connectivity focuses exclusively on structural connectivity, despite the fact that functional connectivity is much more relevant for wildlife conservation and management. The 2008 American Wildlands Priority Linkage Assessment may not be the best source.

The Forest should establish a standard that protects the connectivity value of approach habitat.

Response

In response to comments, section 3.7.6 summarizing wildlife habitat connectivity and the Forest's use of connectivity models was added to the final EIS. In the last decade, a large number of connectivity models have become available, and each of them focuses on different aspects of connectivity and uses different assumptions. Some target particular species (grizzly bear, wolverine, Canada lynx), whereas others consider different factors that can affect connectivity (human developments, roads, riparian areas, vegetative cover). Some models are based upon data about actual animal movement using telemetry data, whereas others are based upon landscape features and do not use actual animal movement data. The Forest appreciates the public comments that made us aware of new connectivity models. They were considered for the final EIS (see Kuennen, 2017a). See also the comments and responses under Alternatives—Wildlife Connectivity Effects for a discussion of connectivity models.

In the Forest's development of plan components for connectivity as well as its GIS-based analysis of connectivity, the Forest used multiple models and considered multiple species. In order to connect large land areas and populations of highly mobile species, planning included consideration of public lands, private lands, and issues related to transportation corridors. The Forest carefully considered 2012 planning rule direction for connectivity (36 CFR 219.8(a)(1)(iii)) and assessed key ecosystem characteristics (Forest Service Handbook 1909.12.13), including habitat connectivity.

Some commenters stated that the draft EIS did not consider multiple aspects of connectivity (including both functional and structural connectivity) or that the Forest used outdated science for assessing connectivity (because Ecosystem Research Group modeled the connectivity of forest cover using American Wildlands' 2008 linkage polygons). These commenters appear to have focused on the section of the draft EIS entitled "Coniferous forest connectivity" beginning on page 366 of the draft EIS. As a result, they may have missed the discussions of functional and structural connectivity in other sections of the draft EIS. For example, connectivity for multiple species was addressed in volume 1 of the draft EIS on pages 275-280, 327-332, 347-355, 363-371, 400, 403-404, 408, 418-419, 427-428, 440-441, 444, 453-459, 469-471, and 476.

See also Ecosystem Research Group's discussion (final EIS, appendix 3) as to why they used American Wildlands (2008) linkage polygons for modeling the connectivity of forest cover for the alternatives. Although it is true that newer, more complex connectivity models are available, these more recent models are based upon resource selection functions or circuit flow models. The SIMPPLE model used for analyzing the effects of alternatives is not able to use continuous variables such as resource selection functions or circuit flow models as input, so the Forest needed to use polygons in its analysis of forest cover by alternative. However, the Forest did use other, newer models to assess other aspects of connectivity.

The Forest used the best available scientific information in the development of plan components and analysis of connectivity for target species. See more details in section 3.7.6 and in the sections listed below:

See section 3.7.5 of the final EIS, Canada lynx and critical habitat.

See section 3.7.5 of the final EIS, Wolverine.

See section 3.7.5 of the final EIS, Grizzly bear. Multiple publications were used for the grizzly bear. To identify approach areas, the Interagency Grizzly Bear Committee recommended consideration of topography, habitat quality, road density, riparian presence, human developments and activities, vegetative cover, land ownership patterns, and the relative mobility of the target species. The Forest considered science by Ament and others (2014), Proctor and others (2012), and Weaver (2014) for connectivity of approach areas. Ament and others (2014) did not identify key highway crossing areas for portions of grizzly bear habitat along Highway 83, nor did Proctor and others (2013). For the Swan Valley, the Forest asked Mace and Roberts to examine grizzly bear satellite telemetry locations for the Swan Valley to see if any key areas could be identified. They stated that grizzly bears use the majority of the Swan Valley, moving back and forth across the highway between the Mission and Swan mountain ranges in multiple areas. As a result, very broad connectivity areas were identified in the Swan Valley (see desired condition GA-SV-DC-09 and guideline FW-GDL-IFS-12).

See section 3.7.4 of the final EIS, Coniferous forest habitats; Cliff, cave, scree and rock habitats.

See section 3.7.4 of the final EIS, Aquatic, wetland, and riparian habitats. For species such as amphibians and small mammals, downed woody material contributes to connectivity.

In response to comments, guideline FW-GDL-IFS-12 now addresses approach areas.

Plan components support connectivity for a wide variety of species by (1) providing for ecological conditions that meet subsistence and movement needs in connectivity areas, (2) limiting mortality risk through management of motorized access and recreation, (3) implementing attractant storage orders, and (4) stating desired conditions to work with adjacent landowners and other interested parties to maintain or improve connectivity and linkage opportunities across multiple jurisdictions (e.g., coordinating with the counties on planning and zoning, cooperative agreements, highway approaches and crossings, and land consolidations, exchanges, acquisitions, and conservation easements).

With respect to connectivity in particular areas of the Forest, some commenters mentioned models of landscape permeability among forested areas in the Canada-U.S. transboundary region, based on the assumption that areas with less human modification of land cover and human activities (i.e., greater “naturalness”) are more important for connectivity because they are more likely to allow for animal movement and natural occurrence of ecological processes. The Forest reviewed plan components that address connectivity between the Forest and Canada and between the Forest and Glacier National Park in the U.S. transboundary region, considering management area allocations in the forest plan alternatives with respect to land cover and human activities. Along the Canadian border, alternative B modified includes about 80,000 acres in the Tuchuck-Whale recommended wilderness (management area 1b) area, which is not suitable for timber production, mechanized transport, or motorized use. This recommended wilderness area encompasses a large portion of the U.S. transboundary region. Alternative B modified also allocates blocks of management areas 5 and 6a in the transboundary region, providing a high level of emphasis on wildlife habitat connectivity. With the exception of a few designated routes,

most of the transboundary region is in management area 1b (recommended wilderness), 5a (backcountry nonmotorized year-round primitive), 2a (wild and scenic river), or 6a (general forest low-intensity vegetation management), and these management areas are not suitable for timber production. The Frozen Lake area has motorized access from Canada and provides access important to the U.S. Border Patrol, as does the North Fork Road, so access in these transboundary areas would be maintained under alternative B modified.

Some commenters supported the forest plan's focus on the need for connectivity across the Highway 2 corridor that runs between the Forest and Glacier National Park but wanted the Forest to establish a standard. A specific connectivity standard is not necessary in this area because plan components (including desired conditions, suitability, objectives, management areas, guidelines, and standards for motorized access) are sufficient to provide for connectivity between Glacier National Park and the Forest. For example, the revised guideline FW-GDL-IFS-12 combined with desired condition GA-MF-DC-04 and the management areas adjacent to and approaching much of the U.S. Highway 2 corridor (e.g., management areas 5 and 1a) provide for relatively high levels of wildlife habitat security and connectivity. Specific areas identified for connectivity between Glacier National Park and the Forest in FW-GDL-IFS-12 (east of Columbia Falls and east of Essex) are based upon highway segments identified in the best available scientific information (cited below the table in the guideline). In addition, alternative B modified adds recommended wilderness (management area 1b) in the Slippery Bill-Puzzle area of the Middle Fork. This management area allocation is not suitable for mechanized transport or motorized use and provides connectivity with adjacent areas along the Badger-Two Medicine area of the Lewis and Clark National Forest and Glacier National Park.

Some commenters voiced their concern for connectivity along the Swan-Clearwater Divide and Sunset Ridge—specifically for lynx, wolverine, and grizzly bears (as well as other species). Alternative B modified includes about 43,000 acres along the Clearwater Divide and the Swan Mountains in the Swan Front recommended wilderness area (management area 1b), which is not suitable for timber production, mechanized transport, or motorized use. In the Clearwater Divide and Sunset Ridge Area west of U.S. Highway 83, the forest plan allocates areas of management area 6a, which are not suitable for timber production. In total, these management area allocations provide a high level of emphasis on wildlife habitat connectivity along the Swan-Clearwater Divide and Sunset Ridge.

Some commenters were concerned about connectivity around the Hungry Horse Reservoir. As explained in the final EIS, the flooding of the reservoir has had detrimental effects on connectivity for some species, but other species are able to swim across it. For example, grizzly bear telemetry data has documented that grizzly bears have swum across the reservoir as well as across Flathead Lake. The forest roads that surround the reservoir are not barriers to animal movement, as discussed in the sections on connectivity for a variety of wildlife species. As stated in the section of the forest plan on management area 7 related to Hungry Horse Reservoir, the desired condition for the southern end of the reservoir emphasizes dispersed recreation accessible by boat and vehicle. The reservoir shoreline is about 35 miles long, with scattered dispersed recreation sites and undeveloped areas in between these sites, so connectivity is anticipated to continue to be available. Plan components for riparian management zones also apply to the area within 300 feet of the reservoir, contributing to connectivity.

In summary, ecosystems and their composition, structure, dominant processes, and connectivity are addressed in the Flathead National Forest assessment (USDA, 2014a), the forest plan, the biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017), and the final EIS. New science

submitted in response to comments was considered in the final EIS and is summarized in Kuennen (2017a). Appendix 6 of the final EIS provides a cross-reference of key plan components that address connectivity. Appendix 4 of the final EIS documents how connectivity was considered in the Forest's wilderness inventory. The set of plan components in the forest plan creates several functional connectivity areas or linkage zones in key areas between Forest lands and adjacent lands, considering all land ownerships, multiple wildlife species, and the body of work considered to be the best available scientific information.

Wildlife—Mountain Goat

Comment (letter numbers 2869, 2985, 3087)

The restriction that limits disturbance to mountain goats from December to July should be extended to mid-July to completely avoid the kidding period.

The Forest should include a more specific discussion in the analysis for mountain goats on page 315 of the draft EIS where it says "In winter, goats are at risk to disturbance due to recreation activities," citing Canfield et al. (1999).

The Forest should add snowmobiling to the list of key stressors under Forest Service control (draft EIS, vol. 1, page 316) and eliminate snowmobiling in the vicinity of mountain goat winter habitats to sustain this species over the long term.

The Forest makes contradictory statements in its assessment of effects to mountain goats. The following statement in the draft EIS directly contradicts statements in the previous bullet point:

Varley's review of human disturbance on mountain goats concluded that human disturbance such as over-snow vehicle use on mountain goat winter habitats is rare due to the steepness, ruggedness, and low snow accumulations of mountain goat winter habitats. Snowmobilers seek out deep snow that mountain goats avoid.

The practice of "high marking" by snowmobilers has the potential to bring snowmobilers into key mountain goat wintering areas, leading to disturbance of these animals at a time of year when they are particularly vulnerable.

Response

Most of the mountain goat habitat on the Forest is in existing wilderness areas (management area 1a). Under alternative C and the preferred alternative, B modified, much of the mountain goat habitat on the Forest is included in recommended wilderness (management area 1b). Under these two alternatives, recommended wilderness is not suitable for mechanized or motorized use, and therefore high marking by snowmobiles would not be a concern. Under alternative B modified, additional protection for mountain goats would affect several areas that provide wintering and kidding habitat. This includes about 43,000 acres in the Swan Front recommended wilderness area, about 19,000 acres in the Alcove-Bunker recommended wilderness area, about 18,000 acres in the Jewel Basin recommended wilderness area, about 12,000 acres in the Slippery Bill-Puzzle recommended wilderness area, and about 1,800 acres in the Java-Bear Creek recommended wilderness area. Outside of wilderness or recommended wilderness, alternative B modified includes changes in snowmobile suitability in the upper end of the Sullivan Creek drainage that would also protect mountain goat habitat. Under alternative B modified, the second date in forestwide guideline FW-GDL-WL DIV-04 was changed to July 15 to completely avoid the mountain goat kidding period and to more specifically address activities known to disturb

mountain goats, based upon the best available scientific information. In the EIS, the Forest cites the best available scientific information as well as conflicting science. If conditions change in the future—if, for example, monitoring methods or specific threats to this species are identified that are within Forest Service authority or capability to address—the forest plan may be amended or revised if deemed necessary.

Wildlife—Pollinators

Comment (letter numbers 2875, 3009)

The forest plan should have more direction related to pollinator habitat and its connectivity, including monitoring items. The latest transportation act (FAST Act of 2015, Public Law No. 114-94) gives possible direction.

Response

As discussed in the EIS, the Forest Service has implemented strategies designed to promote the health of pollinators and their habitat that are incorporated into existing botany programs on the Flathead National Forest and in forest plan components for native plant species, non-native invasive species, snags, and downed wood (see final EIS, section 3.7.9, and table 1 in appendix 6 for more details). The FAST Act is applicable to county, state, and national transportation systems, although the minimum mowing and other roadside management practices encouraged in the act is already essentially the practice on National Forest System roads. The Forest believes that a coarse-filter approach, as well as a monitoring approach that addresses the ecological conditions pollinators depend upon, is the most reasonable and achievable management approach to address the needs of pollinator species. The plan components that address vegetation diversity and desired conditions for vegetation are based upon the natural range of variation and provide habitat conditions that support the wide diversity of native pollinator species. Desired condition FW-DC-POLL-01 specifically addresses pollinators. Additional species-specific forest plan components are not considered necessary at this time. However, if conditions change in the future—for example, if key pollinator species, monitoring methods, or specific threats to species are identified that are within Forest Service authority or capability to address—the forest plan may be amended or revised if deemed necessary. The forest plan and the analysis in section 3.7.9 of the final EIS are expanded and clarified to better address some of the strategies and expected effects on the Forest that have been identified nationally to promote the health of pollinator species.

Wildlife—Species Diversity, Populations, Distribution

Comment (letter numbers 200, 2632, 2821, 2987, 2989, 2995, 3062, 3070)

The Forest should manage for all species, not just species of concern.

The Forest should discuss how it intends to recover healthy wildlife populations and distribution in the next three decades for those species whose trends have been downward over the last three decades, especially in light of the best available science concerning the potential impacts of climate change. Of particular interest are the cumulative effects of forest plan implementation for the following species: wolverine, fisher, northern goshawk, northern hawk owl, Lewis's woodpecker, Canada lynx, and pika.

Response

Plan components in the forest plan manage for biodiversity across the Forest, including all wildlife species. Appendix 6 of the final EIS identifies species known to occur on the Flathead National Forest and their association with key habitats and ecosystem characteristics. Most species are addressed by coarse-filter plan components that are tied to key ecosystems and ecosystem characteristics, such as very large trees, snags, downed woody material, or riparian areas. Plan components in the Aquatic Ecosystems and Terrestrial Ecosystems and Vegetation sections of the plan, as well as suitability of lands for activities such as motorized over-snow vehicle use, mechanized use, and timber production, have been integrated with wildlife habitat needs. For example, the Infrastructure section of the plan integrates wildlife needs into plan components for motorized and nonmotorized roads and trails, and the Recreation section of the plan integrates wildlife into plan components for other recreation uses. Appendix 7 of the final EIS provides a summary of climate adaptation strategies in the forest plan. Section 3.7.4 of the final EIS discusses wildlife effects by key habitats and characteristics (considering effects to most species first) and then discusses the effects of alternatives on particular species nested within that framework.

The draft EIS discussed what is known about populations and the cumulative effects of changing climate on habitat for the specific wildlife species listed by the commenter (see the summaries that follow). The final EIS has been updated and clarified in response to the comments. The Forest knows of no scientific evidence documenting population declines for many of these species.

Wolverine: See final EIS, section 3.7.5, on wolverine. Alternative B modified includes numerous plan components to provide for wolverines and their habitat, including (but not limited to) ones that provide for denning. For example, wolverine denning habitat within management area 1a (designated wilderness), management area 1b (recommended wilderness), management area 5a (backcountry nonmotorized year-round primitive), and management area 5d (backcountry motorized wheeled vehicle use on designated roads, trails, and areas from April 1 to November 30) have very low levels of human disturbance. These management areas encompass persistent spring snow habitat in the Mission, Swan, and Whitefish Mountain Ranges as well as along the Continental Divide from the southern end of the Bob Marshall Wilderness to Glacier National Park to Canada. In valleys between areas of persistent spring snow habitat, plan components for habitat connectivity for multiple species would also support dispersal and long-distance range shifts of the wide-ranging, highly mobile wolverine. Plan components for diverse wildlife habitats provide for the species wolverines feed upon, such as rodents, mountain goats, deer, elk, and moose, as discussed in the “Forest ungulates” subsection of section 3.7.4 of the final EIS. Wolverine habitat is distributed across the Forest’s geographic areas, except for some portions of the Salish Mountains geographic area where elevations are not high enough to provide persistent spring snow.

Fisher: See final EIS, section 3.7.4, “Old-growth forest, very large live trees, and very large dead tree habitat,” on fisher. The forest plan discusses potential effects of a changing climate on fisher habitat and includes numerous plan components to provide for fisher habitat. Plan components include (but are not limited to) those that provide for old-growth forest, very large snags, large downed woody material (to provide for fisher resting and denning habitat), and diverse habitats for fisher prey species. Abundant riparian management zones (see final EIS, figure 1-07) are distributed across the Forest and also provide habitat connectivity. Also see the comments and responses under Access—General.

Northern goshawk: See final EIS, section 3.7.4, subsection “Coniferous forest habitat,” on northern goshawk. The forest plan includes numerous plan components that provide for goshawks and their habitat. Plan components include (but are not limited to) those that provide for goshawk nesting as well as diverse habitats for goshawk prey species. Plan components for old-growth forest and large to very large trees provide habitat for nesting. Desired conditions for burned forests and ponderosa pine/Douglas-fir forests provide for the open understory conditions that allow goshawks to maneuver between trees to hunt.

Northern hawk owls: See final EIS, section 3.7.4, subsection “Burned forest and dead tree habitats.” The forest plan includes numerous plan components to provide for northern hawk owls and their habitat, including (but not limited to) those that address burned forests for nesting and foraging as well as other diverse habitats (such as riparian management zones) where hawk owls may hunt. Burned forest is currently distributed across all Forest geographic areas, as is riparian habitat.

Lewis’s woodpecker: This species is not known to occur on NFS lands on the Forest, but it is associated with ponderosa pine. Anticipated effects of climate change on ponderosa pine are discussed in the final EIS, sections 3.3 and 3.7.4 on the flammulated owl.

Canada lynx and Canada lynx critical habitat: See final EIS, section 3.7.5, “Canada lynx” and “Canada lynx critical habitat.” The forest plan includes numerous plan components to provide for Canada lynx and their habitat, including (but not limited to) NRLMD management direction in appendix A of the forest plan; terrestrial ecosystem plan components that provide for diverse habitats of snowshoe hare and other lynx prey species; terrestrial ecosystem plan components to provide for old-growth forest, very large snags, and large downed woody material that provides denning habitat; and numerous plan components for habitat connectivity (including standards in appendix A as well as other plan components to provide connectivity for multiple species). Canada lynx habitat is distributed across all Forest geographic areas, and critical habitat is distributed across all but the Island Unit portion of the Salish Mountains geographic area.

Pika: See final EIS, section 3.7.4, subsection “Cliff, cave, scree, and rock habitats.” The forest plan includes numerous plan components that provide for the pika and their rocky, high-elevation habitats. Most of the pika’s habitat is within management areas where there are few threats, such as management area 1a (wilderness), management area 1b (recommended wilderness), and management area 5 (backcountry). Pika habitat is distributed across the Forest’s geographic areas, except for some portions of the Salish Mountains geographic area where elevations are not high enough.

Wildlife—Wolverine Guidelines

Comment (letter number 2904)

Guideline FW-GDL-WL SOI-04 should be an enforceable standard that applies to all winter recreation in denning habitat (starting in February, when wolverines typically give birth). The Forest should take specific action (including closures) to protect the wolverine during the denning season.

Response

In response to comments, guideline FW-GDL-WL SOI-04 has been replaced by two guidelines that address human activities in wolverine reproductive habitat during the denning season. FW-GDL-WL-05 now addresses helicopter use from February 15 to May 15. Potential effects of

motorized over-snow vehicle use on wolverines is addressed by guideline FW-GDL-REC-04, which states that there should be no net increase in the percentage of modeled wolverine maternal denning habitat where motorized over-snow vehicle use is identified as suitable on NFS lands at a forestwide scale. Specific locations of routes or areas suitable for motorized over-snow vehicle use are specified in figures B-03 and B-04. The Forest does not know of any scientific information that demonstrates that existing levels of motorized over-snow vehicle use, roads, or trails need to be limited to conserve the wolverine on the Forest. As cited in the EIS, Heinemeyer and Squires (2014) stated “Wolverines appear to tolerate winter recreation in their home ranges, including denning females.” Wolverines have been documented to persist and reproduce in habitats with high levels of human use and disturbance, including developed alpine ski areas and areas with motorized snowmobile use (Heinemeyer, 2012; Heinemeyer & Squires, 2013). In addition, as explained in the final EIS, section 3.7.5, subsection “Wolverine,” habitat for the wolverine is also protected by the Forest’s management area allocations. About 59 percent of modeled wolverine habitat is in existing wilderness, and the forest plan adds additional modeled denning habitat as recommended wilderness (management area 1b). In total, plan components in the forest plan are sufficient to conserve the wolverine, so changing guidelines to standards is not necessary. In the final EIS, the Forest disclosed uncertainty regarding the effects of winter recreation on females with young. As new science becomes available in the future, it will be considered, and the plan can be adapted, if warranted.

Wildlife—Wolverine Habitat

Comment (letter numbers 2649, 2869, 2875, 2901, 2904)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should study why there is a lack of connectivity and gene flow between the Canadian population of wolverines and wolverines in the Flathead; the Forest should work with other agencies to study the source of the problem as part of the forest plan revision process. The Forest should distinguish between maternal and natal denning habitat for wolverines. The Forest should develop a monitoring program to test “relevant assumptions” (Forest Service Handbook 219.2) regarding the effects of motorized recreation on wolverine persistence.
2. Plan components for the wolverine should be improved by reducing the variety and intensity of non-climate stressors on this species. The Forest should provide a comprehensive table to clarify, in detail, which climate adaptation strategies and tactics would protect the wolverine. The forest plan should include provisions and standards to protect denning habitat (both maternal and natal) from winter recreational activities and, where necessary, minimize the harm from such activities. The Forest should, at a minimum, (a) close or restrict motorized access to remote management areas known to be occupied by resident wolverines on the Forest, including denning sites (both maternal and natal) during the trapping season; (b) prohibit or restrict the use of U.S. Fish and Wildlife Service’s federal predator control programs in areas known to be occupied by resident wolverines on the Forest; and (c) create special management areas for areas known to be occupied by resident wolverines, including denning sites, that include standards prohibiting the use of certain types of traps, snares, and baits within and adjacent to the management area. The Forest should also explore other ways to regulate, restrict, and limit all forms of trapping, snaring and poisoning in occupied wolverine habitat (including dispersal corridors) within the Forest.
3. The Forest downplays impacts to wolverine from winter recreation, contrary to the best available science, including the Heinemeyer papers cited by the Forest in the draft EIS. In spite of

the uncertainty, the Forest should adhere to the precautionary principle and limit all non-climate stressors on the species, evaluating each and every proposal to engage in winter recreational activities in occupied wolverine habitat on a project-level basis after carefully reviewing the best available science. See Krebs et al. (2007, p. 2190).

4. The Forest should identify and protect linkage zones between subpopulations of wolverines within and adjacent to the Flathead. The forest plan should include a desired condition for wolverine connectivity and should use Schwartz et al. (2009) to delineate those areas of the Flathead National Forest most critical for wolverine connectivity.

Response

See also the comments and responses under Wildlife—Wolverine Guidelines.

1. For a rare, wide-ranging species such as the wolverine, addressing questions such as lack of gene flow between the Canadian population of wolverines and wolverines in the Flathead takes more than a monitoring program—it takes a research effort. Research has not been conducted on the Forest that would allow the Forest to distinguish between maternal and natal denning habitat. The final EIS clarifies that the same type of habitat provides maternal and natal denning habitat but that it can be separated by distances up to about 2 miles. Research regarding wolverines and winter recreation is currently being conducted by the Rocky Mountain Research Station. Research is not part of the purpose and need of the forest plan, but new scientific information will be considered as it becomes available.

2. In response to comments, a table addressing climate strategies listed by the Northern Region Adaptation Partnership (NRAP, 2015) has been added as appendix 7 of the final EIS. A variety of plan components address the variety and intensity of non-climate stressors. For example, plan components for management areas provide “refugia” with persistent spring snow habitat for wolverines, including wilderness areas (management area 1a) and recommended wilderness areas (management area 1b), which are not suitable for timber production, mechanized transport, or motorized uses. The forest plan also allocates backcountry management areas for nonmotorized use year-round (management area 5a). Because some of these combined management areas are very large (over 1.4 million acres), remote, and receive lots of snow, they are difficult to access during the winter trapping season, even by non-motorized means. Forest Service authority to regulate trapping on NFS lands is clarified in the wolverine subsection of section 3.7.5 in the final EIS. Section 2.4.6 of the final EIS has a section entitled “Alternatives considered but not given detailed study.” This section includes an alternative to close National Forest System lands to trapping and/or hunting. Current MFWP regulations allow no trapping or harvest of wolverine on the Forest.

3. Some interpret it as downplaying effects, but NEPA requires that the Forest discuss uncertainty and opposing science. As discussed in the final EIS, there is some scientific uncertainty regarding the effects of non-climate stressors, including some types of human disturbance, on wolverines. Nevertheless, plan components under alternative B modified limit the risk of human disturbance in wolverine habitat. The Forest used Krebs et al. (2007) for development of plan components and analysis of effects of alternatives where appropriate. However, as stated by Krebs et al., “Additional focused research simultaneously examining wolverine use with helicopter skiing and backcountry skiing activity will be required to adequately assess impacts of this growing land use on wolverines in the mountains of western North America” (p. 2189).

4. Section 3.7.5 of the final EIS, subsection “Wolverine,” discusses Schwartz et al. (2009) with respect to the genetic connectivity of subpopulations of wolverines. This section also identifies key habitats and connectivity areas for wolverines between the Flathead National Forest and surrounding lands. Schwartz and others used models of persistent spring snow cover developed by Copeland and others (shown in white on figure 1 and purple on figure 4) for their modeling of genetic connectivity. As stated in the Wolverine “Affected environment” section of the EIS, the Forest used these models of persistent spring snow cover, as well as Weaver (2014), in its wilderness evaluation, in developing forestwide plan components for the wolverine, and for assessing the effects of alternatives. As shown in figure 4 of Schwartz et al. (2009), there is modeled connectivity between the United States and Canada in the northern Rocky Mountains, encompassing the Flathead National Forest and Glacier National Park. Multiple plan components for geographic areas include desired conditions to contribute to wolverine habitat connectivity, including GA-HH-DC-03, GA-MF-DC-04, GA-NF-DC-06 and 07, and GA-SV-DC-09.

Wildlife—Wolverine Habitat Mapping and Conservation

Comment (letter numbers 2869, 2904, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. Forest plan components for the wolverine are sufficient to conserve the wolverine. Forest plan components for the wolverine need to be improved.
2. The Forest should use different models for the wolverine analysis. The Forest should use only one methodology or model to clearly define and map wolverine denning habitat and range in the Flathead. The models discussed in Copeland (2010), Inman (2013), and Weaver (2014) should be used. The Forest Service must acquire and map information on the local population (actual and trend), where wolverine reside and are denning (both maternal and natal), and where they are traveling and moving within the Forest.
3. It is premature to assume no impacts on the wolverine from vegetation management because very little study has occurred and there is certainly no consensus.
4. The desired conditions that explicitly identify key corridors for the wolverine across the Forest and the region (e.g., 03 on p. 125 of the draft EIS, 07 and 08 on p. 133, and 09 on p. 150; Table 21 on p. 74) are helpful. The Flathead must develop species-specific plan components, including specific standards and guidelines for the wolverine. The inclusion of FW-GDL-REC-05 is good, but more should be done to meet rule requirements for the conservation of the wolverine. The exceptions to guideline 04 on p. 55 are not appropriate.
5. The Forest should include a more integrated analysis of cumulative impacts to wolverine from climate change in combination with other non-climate stressors, including but not limited to forest management, mortality from trapping, small population size, increased access into core habitat, transportation corridors, winter recreation, ski area expansion, travel planning, anticipated increase in fragmentation between subpopulations, shrinking habitat, and natural forms of mortality (predation, avalanche, starvation).
6. The Forest should add more specificity to the wolverine monitoring item, such as who would be responsible for collecting data on wolverine disturbance by over-snow vehicle use, where and how often data would be gathered, and what the triggers would be for taking corrective action.

7. The Forest Service should work with USFWS and other experts to prepare a Wolverine Conservation Assessment and Strategy, enter into conservation agreements with the USFWS, and then develop regionwide management direction for wolverine, including a Northern Rockies Wolverine Management Direction that amends all forest plans within wolverine habitat. The Forest has a legal obligation under section 7 of the Endangered Species Act to conference with the USFWS on the wolverine during the forest plan revision process and must take proactive steps to avoid the Federal listing of wolverine in order to conserve the species.

Response

1. The forest plan includes numerous plan components to support the conservation of the wolverine. See also the comments and responses under Wildlife—Wolverine Guidelines and Wildlife—Wolverine Habitat.

2. The Forest did use all of the models mentioned by the commenter and disclosed that there is some scientific disagreement about wolverine habitat modeling having to do with scale, as explained in the final EIS, section 3.7.5, subsection “Wolverine.” The Forest considered Weaver’s (2014) publication on the wolverine (see “Wolverine” subsection of section 3.7.5 in the final EIS) and explained the rationale for the Forest’s use of Copeland and others (2010) for modeling maternal denning habitat. Use of Copeland and others (2010) provides the Forest with an indicator of habitat quality (e.g., areas with persistent spring snow seven out of seven years versus only having persistent spring snow for one out of seven years on average) and of which areas would be most likely to retain snow the longest, even under changing climatic conditions. The Forest used Inman and others (2013) for wolverine habitat on the Forest as a whole and to put the Forest’s wolverine habitat in a larger context.

As stated in the final EIS section 3.7.5, subsection “Wolverine,” the Forest and other cooperators collect non-invasive monitoring data, including the use of remote cameras and DNA analysis of hair and/or scat, and these methods have detected wolverines. Data have not been collected for a long enough period of time to establish a trend. The Forest has not located wolverine dens or travel routes on the Forest because this would require a research effort. However, the Forest has used the best available scientific information on wolverine den locations and travel routes, based on research conducted by Copeland and Yates in Glacier National Park adjacent to the Forest (Copeland & Yates, 2006).

3. As cited in section 3.7.5 of the final EIS and on pages 327-328 of the draft EIS, the Forest used the best available scientific information on the effects of vegetation management on wolverines (Copeland, 1996; Krebs et al., 2007; USFWS, 2014b).

4. Plan components that address the wolverine have been refined and clarified in the preferred alternative, B modified. See also the comments and responses under Wildlife—Wolverine Guidelines and Wildlife—Wolverine Habitat.

5. The draft EIS discusses cumulative effects based upon the best available scientific information, including but not limited to forest management, mortality from trapping, small population size, dispersed recreation, and transportation corridors. The Forest has integrated its discussion of cumulative effects based upon what is currently known. Although snow is melting two weeks earlier, on average, in the northern Rocky Mountains, the Forest knows of no scientific evidence of inadequate snow depth creating impacts to the wolverine due to climate change. Science indicates that high elevations in northwest Montana are expected to retain spring snow on some slopes and aspects, with distribution that is likely to continue to provide for the needs of the

wolverine population. If problems become apparent in the future that would require changes in the forest plan, the forest plan can be amended, if necessary. If isolated problems become apparent in the future, the Forest can address them site specifically or with administrative actions such as temporary closure orders.

6. Chapter 5 of the forest plan includes monitoring item MON-WL-17 for mesocarnivores, including the wolverine. The USDA Forest Service Northern Region is currently cooperating with the Rocky Mountain Research Station and state wildlife management agencies to develop a comprehensive monitoring strategy that would include wolverines. The regional effort will determine where and how often data would be gathered. As stated in the introductory sections of chapter 5 of the forest plan, some monitoring questions must be addressed at larger scales and/or by researchers. As stated in section 3.7.5 of the final EIS, subsection “Wolverine,” research regarding wolverines and motorized over-snow vehicle use (as well as other types of recreation use) is ongoing, but the Forest is not able to determine more specific monitoring parameters or triggers at this time.

7. The Forest followed appropriate procedures for the wolverine, based upon its Federal status as a proposed species, and requested conferencing with the USFWS. The USFWS is working on a species status assessment for the wolverine, and the Forest will work with other agencies in the future as a wolverine conservation plan is developed.

Wildlife–Wolverine Protection and Monitoring

Comment (letter numbers 2869, 2904, 2940)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. The Forest should designate recommended wilderness as the best administrative means of sustaining and improving the resilience of the wolverine (and other) highly valued wildlife species.
2. The Forest should secure and protect refugia within the species’ current range and secure and restore movement paths to maintain or improve travel corridors, as outlined in the Flathead National Forest assessment.
3. The Forest should consider an alternative that does not allow motorized over-snow vehicle use on any of the currently modeled wolverine denning habitat (given that modeled maternal denning habitat may decrease as climate change leads to lower snowpacks and earlier snowmelts).
4. The Forest should make the wolverine a focal species.
5. The Forest should establish a wolverine monitoring program to evaluate whether components need to change to better conserve the planning area population, testing “relevant assumptions” (Forest Service Handbook 219.12) associated with the relationship between the forest plan and wolverine persistence, including assumptions and uncertainty regarding management impacts, particularly motorized recreation, on wolverine persistence. Specific monitoring questions should be added to the forest plan.

Response

See also the comments and responses under “Wildlife—Wolverine Habitat Mapping and Conservation,” “Wildlife—Wolverine Guidelines,” and “Wildlife—Wolverine Habitat.”

1. Recommended wilderness is one means of sustaining and improving resilience of the wolverine. Additional recommended wilderness that provides wolverine core habitat and maternal or natal denning habitat is included in the forest plan, with varied amounts and distribution assessed for alternatives A, B modified, and C. Additional plan components designed to provide for diverse, resilient habitats and diverse prey species across the Forest also benefit the wolverine.
2. The wilderness inventory (appendix 4 of the final EIS), section 3.7.5 of the final EIS, subsection “Wolverine,” and volume 1 of the draft EIS (pages 325-332) discuss the acres of modeled wolverine habitat in existing wilderness and recommended wilderness “refugia,” as well as the effects of plan components for connectivity. The geographic area sections of the forest plan identify key connectivity areas, linkages, and travel corridors for multiple species (including the wolverine), and desired conditions for their management are described.
3. Section 2.4.6 of the EIS has a section entitled “Alternatives considered but not given detailed study.” This section includes an alternative for “no winter motorized recreation” that addresses the wolverine, Canada lynx, and grizzly bear.
- 4, 5. The responsible official did not select the wolverine as a focal species (also see the comments and responses under Monitoring—Wildlife), but there is a monitoring item in chapter 5 of the plan (MON-WL-17) that includes the wolverine. The Forest’s monitoring strategy is in conjunction with the USDA Forest Service Northern Region’s broad-scale monitoring strategy. The Northern Region is currently developing specific monitoring questions for the wolverine as well as other mesocarnivores, and the Flathead National Forest’s monitoring questions will be encompassed by the regional monitoring umbrella. For species such as the wolverine, testing relevant assumptions (Forest Service Handbook 219.12) and uncertainty regarding climate change and management impacts (particularly motorized recreation) on persistence requires more than a Forest Service monitoring effort—it requires a research effort. Research regarding management impacts (including motorized recreation) is currently being conducted in Idaho and other western states by Heinemeyer and Squires. Annual reports from this research effort are cited in section 3.7.5 of the final EIS, subsection “Wolverine.” A peer-reviewed publication of this research is not yet available.

Wildlife—Wolverine Status and Conservation

Comment (letter numbers 201, 2940, 3028)

Note: The comments under this area of concern are subdivided for clarity. The responses that follow are keyed to the comment numbers.

1. When developing plan components for the wolverine, the Forest should meet regulatory requirements for species of conservation concern to meet the requirements of the 2012 planning rule and allow for continuity in the face of uncertainty over the legal conservation status of the wolverine.
2. The Forest should consider conservation measures identified in existing conservation strategies and agreements relevant to proposed and candidate species in the plan area.

3. The Forest should consider limiting factors and key threats to species identified in proposed rules from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service for listing or candidate species assessments.
4. The Forest should engage with U.S. Fish and Wildlife Service and the National Marine Fisheries Service in the evaluation of existing conditions for proposed and candidate species and in the development of plan components designed to conserve these species.
5. The Forest should work beyond the plan area boundary to collaborate and cooperate with U.S. Fish and Wildlife Service, the National Marine Fisheries Service, States, tribes, other partners, landowners, and land managers to support an all-lands approach to conserve proposed and candidate species.

Response

1. In September 2016 (after the Forest published its draft EIS), the USFWS issued a Federal Register notice that said a court order caused the wolverine's status to be listed as "proposed" and solicited comments. Because the wolverine is currently a species proposed for listing, it cannot be a species of conservation concern. The forest plan components are not based on any particular status of the wolverine; they are based on providing the ecological conditions to support a persistent wolverine population. If the status of the wolverine changes from proposed to listed, then the 2012 planning rule requires plan components to contribute to the recovery of the species. If the wolverine is not a federally listed species in the future, the Forest Service would consider the species a potential species of conservation concern (Forest Service Handbook 1909.12, chap. 10, section 12.52(d)(2)(b)).
2. As discussed in section 3.7.5 of the final EIS, subsection "Wolverine," the Forest considered USFWS proposed rules, existing limiting factors, key threats, and conservation measures relevant to the wolverine in the plan area (NFS lands on the Forest) when developing and assessing the effects of plan components.
3. As stated in the wolverine subsection of section 3.7.5 of the final EIS, there is some scientific uncertainty over the extent and magnitude of winter climate effects that may be experienced on the Forest over the anticipated life of the plan, but the forest plan contains plan components that would contribute to conservation of the wolverine by limiting the potential risks.
4. The Forest consulted with the USFWS during the development of plan components and included the wolverine in its biological assessment (Kuennen, Van Eimeren, & Trechsel, 2017) for the forest plan. See the Forest's biological assessment and the USFWS concurrence letter posted on the Forest's website at www.fs.usda.gov/goto/flathead/fpr.
5. Desired conditions for habitat and its connectivity contribute to an all-lands approach for conservation. In response to comments, plan components for the wolverine are refined and clarified in the forest plan and are in compliance with the 2012 planning rule (Forest Service Handbook 1909.12 chap. 23 sec. 13b). Chapter 5 of the forest plan includes monitoring item MON-WL-17 for mesocarnivores, including the wolverine.

Wildlife—Wolves

Comment (letter numbers 2798, 2888)

There is a confusing sentence in draft EIS in vol. 1, p. 360.

Wolf hunting and trapping and the indirect effects of increasing road and trail densities should have been analyzed as threats.

The hunting and trapping of wolves helps to keep wolf populations from growing too fast.

The draft EIS ignores the fact that wolves are faced with more threats than when the population was increasing, stating that the Forest Service should cumulatively analyze the effects of road access on the hunting and trapping of wolves.

Response

Thank you for pointing out the confusing sentence in the draft EIS, volume 1. The portion of the sentence referenced should have ended with a colon rather than a period. This error is fixed in the final EIS.

Final EIS section 3.7.4, subsection “Coniferous forest habitat” on the gray wolf analyzes the cumulative effects of hunting and trapping. As stated in the final EIS and on page 359 of volume 1 of the draft EIS, wolves are less abundant in areas of high road and trail density, which is likely due to higher human-caused mortality. As stated in the final EIS, all alternatives have grizzly bear standards to maintain baseline open and total motorized access densities and secure core, which indirectly provides secure habitat for wolves and reduces the risk excessive wolf mortality. Since the grizzly bear standards would allow for no net increase in roads open to public motorized use for any alternative, an analysis of increasing open road densities is not needed. As explained in the “Gray wolf,” “Affected environment” section of the final EIS (in section 3.7.4, subsection “Coniferous forest habitat”), the minimum known wolf population dropped from 2011-2015 but was still well above the target population of 10 breeding pairs for 3 consecutive years established for recovery. Hunting and trapping have not kept the wolf population from exceeding the recovery goals. The plan components for the Forest are adequate to provide continued habitat protection for wolves. The monitoring of wolf populations is conducted by MFWP, and the Forest monitors habitat conditions, including motorized access. Forest plans are intended to be adaptive, and if changes to the plan are needed in the future, the plan can be revised or amended.

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OCT 03 2016

Ref: 8EPR-N

Chip Weber, Forest Supervisor
Flathead National Forest
Attn: Forest Plan Revision
650 Wolfpack Way
Kalispell, Montana 59901

RE: Flathead National Forest Land Management Plan Revision Draft Environmental Impact Statement, CEQ #20160113

Dear Supervisor Weber:

The U.S. Environmental Protection Agency Region 8 has reviewed the May 2016 Draft Environmental Impact Statement (EIS) prepared by the U.S. Department of Agriculture Forest Service (USFS) for revision of the Land Management Plan (LMP) for the Flathead National Forest (NF) and an amendment of the Helena, Kootenai, Lewis and Clark, and Lolo National Forest Plans to incorporate relevant direction from the Northern Continental Divide Ecosystem (NCDE) Grizzly Bear Conservation Strategy. Our comments are provided for your consideration pursuant to our responsibilities and authority under Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act (CAA).

Project Background

The Flathead NF encompasses 2.4 million acres in northwest Montana and borders Glacier National Park and a remote portion of British Columbia, Canada. The revised forest plan would update the existing 1986 forest plan, and would guide natural resource management activities on the forest. The following four alternatives are analyzed in the Draft EIS:

- Alternative A is the no-action alternative. The forest would be managed under the 1986 forest plan, as amended to date. Approximately 4% of the forest would be managed as recommended wilderness, 17% as backcountry, and 33% as general forest, with 22% of the Forest suitable for timber production.
- Alternative B is the modified proposed action, developed in response to public involvement efforts including scoping. This alternative emphasizes moving towards desired conditions while providing a balance of ecological, social and economic sustainability. Approximately 8% of the forest would be managed as recommended wilderness, 13% as backcountry, and 30% as general forest, with 21% of the forest suitable for timber production.
- Alternative C emphasizes wilderness values, wildlife habitat security, and fish habitat. Achieving desired conditions would rely more on natural disturbance processes as well as prescribed burning, with the lowest acres suitable for timber production. Approximately 21% of the forest

would be managed as recommended wilderness, 6% as backcountry, and 25% as general forest, with 13% of the forest suitable for timber production.

- Alternative D emphasizes a more active management approach to achieve desired future conditions and social, economic and ecological sustainability. Greater emphasis is placed on the use of timber harvest and other mechanical means to achieve desired conditions. No acres are managed as recommended wilderness, approximately 20% as backcountry, and 30% as general forest, with 21% of the forest suitable for timber production.

The Forest Service also proposes to amend the forest plans of the Helena, Kootenai, Lewis and Clark, and Lolo National Forests (“amendment forests”), to incorporate grizzly bear conservation measures from the draft NCDE Grizzly Bear Conservation Strategy. Habitat conditions and management on the forests have contributed to the recovery of the grizzly bear, which is now proposed for delisting within the NCDE. In 2013, the U.S. Fish and Wildlife Service (FWS) announced the availability of a draft Grizzly Bear Conservation Strategy for the NCDE population. By incorporating relevant direction from this Strategy into forest plans, the Forest Service intends to be able to demonstrate to the FWS that adequate regulatory mechanisms exist on national forests to support a delisted grizzly bear population. The Draft EIS analyzes the following three alternatives for the amendment forests:

- Alternative 1 is the no action alternative. The current provisions for management of grizzly bear habitat in the NCDE would remain in effect. Because of the lack of adequate regulatory mechanisms as determined by FWS, the grizzly bear would remain listed under the Endangered Species Act.
- Alternative 2 is the modified proposed action. This alternative would incorporate the habitat-related management direction of the draft NCDE Grizzly Bear Conservation Strategy, including limits on new grazing allotments and developed recreation sites, vegetation management guidelines, and mitigation for mineral and energy development in certain areas.
- Alternative 3 would add additional forest plan components to increase protections for grizzly bears and their habitat on national forest system lands.

A preferred alternative has not been identified at this time.

EPA’s Comments and Recommendations

Many of the recommendations made by the EPA in our scoping comment letter (May 14, 2015) have been addressed by the Draft EIS. Our comments and recommendations related to aquatic resources, air quality, climate change, and mineral resource development are provided in the following sections. Because proposed management actions on the Flathead NF would have a greater likelihood to impact aquatic resources and air quality than proposed grizzly bear conservation measures on the amendment forests, our comments primarily focus on management of the Flathead NF.

(1) Aquatic Resources

Protection of aquatic resources are among the most important issues to be addressed in any NEPA analysis for forest management planning. As a result of the proposed management area category allocations, future actions such as vegetation and habitat management, prescribed fire, motorized use, road construction, oil and gas development, and grazing have the potential to adversely impact aquatic

resources, including surface water, groundwater, wetlands, streams, large rivers, riparian areas, and their supporting hydrology. All action alternatives analyzed in the Draft EIS contain increased protections for water resources relative to current management direction. These proposed forest plan components include:

- Designation of Riparian Management Zones (RMZ), which establish increased protective buffer zones around water resources relative to the existing Riparian Habitat Conservation Areas. Specifically, all intermittent streams will have a 100 foot buffer, and all wetlands will have a 300 foot buffer. Buffers surrounding other waterbody types (e.g., lakes, perennial streams) remain unchanged.
- Establishment of ten new “special areas” specifically designated for protection of fen wetlands. Special areas would be managed in a “substantially natural condition.”

The proposed protections will provide a substantial benefit for aquatic resources. Given the EPA's concerns regarding aquatic resources, we are providing recommendations related to specific water resources, as discussed below.

Surface Water Quality

According to information presented in the Draft EIS, water quality on the forest is generally improving, with 17 of 22 streams originally listed as impaired for sediment removed from the State of Montana's Clean Water Act (CWA) Section 303(d) list as of 2014. The remaining five streams have an existing Total Maximum Daily Load (TMDL). Current riparian direction from the Inland Native Fish Strategy (INFISH), implementation of Best Management Practices (BMPs), reduced road construction and a reduction of timber harvest along streams are identified as likely contributing to this improvement. Eight waterbodies within the Flathead NF are currently listed on Montana's 2014 CWA Section 303(d) list (five for sediment and three for other impairments). Sedimentation/siltation is responsible for the impairments of many of the waterbodies, and is the focus of discussion in the Draft EIS. However, we note that additional causes of impairment on Montana's 303(d) list are often due to (or associated with) forest activities such as timber harvest, road building, culvert installation, grazing, etc., including:

- Alteration in stream-side or littoral vegetative covers
- Other flow regime alterations
- Physical substrate habitat alterations
- Sedimentation/Siltation
- Temperature
- Pathogens (e. coli or fecal coliforms)
- Nutrients (i.e., nitrogen and phosphorus).

We recommend that the Forest Service pay special attention to streams listed for any of these parameters during implementation of the forest plan, including monitoring activities. We recommend minimizing disturbance/activities in watersheds that are listed for the parameters mentioned in the bullets above, including any waterbodies that may be listed in future 303(d) lists. In addition, we recommend that Guideline FW-GDL-WTR-01 pertaining to compliance with TMDLs not be limited to “sediment-producing” activities, and instead apply to all ground-disturbing activities, as additional TMDLs for non-sediment pollutants may be established in the future.

Overall, the Montana Department of Environmental Quality (MDEQ) has assessed approximately 5.2% of stream miles within the forest. To provide perspective for the water quality information presented in the EIS, we recommend that the Final EIS include a map showing assessed waterbodies, unassessed waterbodies, and impaired waterbodies. In addition, to provide a baseline for future monitoring of impacts and evaluating of potential influence on downstream water quality, we recommend the Final EIS provide a summary of any available water quality monitoring data (e.g., total nitrogen, total phosphorus, total suspended solids, temperature, etc.). Identification of significant gaps in monitoring data could be targeted for collection through future project monitoring plans for forest lands. We recommend that the USFS conduct pre- and post-disturbance monitoring of water quality before conducting ground-disturbing activities in proximity to waterbodies, which will enable identification of existing water quality concerns as well as any adverse impacts.

Discussion of water quality impacts and water quality protection in the Draft EIS primarily focuses on compliance with existing TMDLs (e.g., Draft EIS Volume 1 Section 3.2.8, Desired Condition FW-DC-WTR-06, and Guideline FW-GDL-WTR-01). We recommend that all streams listed under Category 4a or 5 on Montana's Section 303(d) list, now or in the future, receive special emphasis to improve water quality conditions. In addition to editing the text of the Final EIS to extend the special water quality considerations to all impaired streams, we recommend adding the following guidelines:

- Ground-disturbing activities in watersheds without water quality impaired waterbodies shall be planned, designed and implemented to protect and maintain project area watershed conditions and water quality to maintain continued support of beneficial uses.
- Ground-disturbing activities in watersheds with water quality impaired waterbodies (listed under Category 4a or 5 on Montana's CWA Section 303(d) list) shall be planned, designed and implemented to not cause further degradation of water quality and thereby promote improved watershed conditions and water quality and restoration of full support of beneficial uses.

While the Draft EIS discusses the potential for nutrient loading to streams due to the presence and handling of beetle-killed trees, it does not address organic loading of area waterbodies. Organic matter can impact public water supplies because it interacts with disinfectants used in the drinking water treatment process to form disinfection byproducts, which are a human health concern. Organic loading may also decrease oxygen levels leading to the release of metals such as arsenic, manganese, and iron from sediments. We recommend the Final EIS provide an assessment of the potential for organic loading impacts to drinking water supplies associated with municipal watersheds.

Groundwater Resources

According to the Draft EIS, there is extensive use of groundwater within the Flathead Valley, although most of this use occurs outside of the forest. Because potential water quality impacts to aquifers are not limited by jurisdictional boundaries, we recommend that the Final EIS provide additional information characterizing groundwater resources in the planning area, as a basis for analysis of potential impact and appropriate protections for groundwater supplies. Including site-specific groundwater information in the Final EIS would enhance the USFS's ability to determine where future leasing stipulations and/or mitigation and monitoring measures may be needed to protect current and future drinking water resources. As this information is likely to be revised within the 15-20 year timeframe of the LMP, the

EPA further recommends the USFS include a commitment in the Final EIS to periodically confirm that the most current groundwater information is being collected and considered in the planning area. We suggest this information be evaluated annually, as feasible, where projects are being considered that could affect groundwater resources.

Specifically, we recommend the Final EIS include a map of all groundwater resources of the Flathead NF and expanded discussion to include the following information, if available:

- Identification of major aquifers (including any Sole Source Aquifers) of the forest, their three dimensional extent, the physical and chemical characteristics of their groundwater, estimates of the quantity of water in the aquifers and aquifer recharge rates;
- Location and extent of groundwater recharge areas;
- Location of shallow and sensitive aquifers that are susceptible to contamination from surface activities, including alluvial aquifers along streams and rivers; and
- Location of existing and potential (i.e., those that can reasonably be used in the future) underground sources of drinking water (USDW).¹

This information can be obtained from the Montana Department of Natural Resources and Conservation (<http://www.dnrc.mt.gov>). For assistance with groundwater data, please contact Millie Heffner, with the Montana Bureau of Mines and Geology, at 406-444-0581.

Public Drinking Water Supply Sources

The Draft EIS discusses Haskill Basin as a municipal water supply watershed, but does not indicate whether this is the only municipal supply watershed on the forest, or what other public drinking water supply sources exist. The MDEQ has conducted source water assessments for groundwater and surface water sources of public drinking water supplies. The EPA recommends that the Final EIS provide additional information on public drinking water supplies, including a map, appropriate for public dissemination, showing the generalized locations of all source water assessment and protection areas associated with public drinking water supplies. Maps may be available from MDEQ or the EPA upon request. Please note that more specific maps, available from the MDEQ, should be utilized by the USFS when locating future project activities. Please contact Joe Meek, with the MDEQ Drinking Water Protection Program, for more information.

(2) Air Quality

Existing Conditions

The Draft EIS identifies three Federal Class I Areas (Glacier National Park, Bob Marshall Wilderness Area and Mission Mountains Wilderness Area) and one non-Federal Class I Area (Flathead Indian Reservation) within the Flathead NF. In addition to the health-based National Ambient Air Quality

¹In general, this includes aquifers with a concentration of total dissolved solids (TDS) less than 10,000 mg/L and with a quantity of water sufficient to supply a public water system. Aquifers are presumed to be USDWs unless they have been specifically exempted or if they have been shown to fall outside the definition of USDW (e.g., over 10,000 mg/L TDS).

Standards (NAAQS) that protect ambient air quality, the CAA provides Class I Areas with special protection for air quality and air quality related values (AQRVs), including visibility. Sensitive Class II Areas are areas for which federal land managers have identified air quality and/or visibility as valued resources. We recommend that the Final EIS identify whether the USFS considers the Great Bear Wilderness Area to be a Sensitive Class II Area, and whether the U.S. Fish and Wildlife Service considers the Swan River National Wildlife Refuge to be a Sensitive Class II area. We recommend that the Final EIS provide trends in air quality and AQRVs over the past several years for the identified Class I areas. Such data are available from the MDEQ and/or the VIEWS site for air quality related values (AQRVs) (<http://views.cira.colostate.edu/web/>). To the extent monitoring information is available, we recommend also providing this information for any Sensitive Class II Areas.

The Draft EIS identifies five PM₁₀ Nonattainment Areas (Columbia Falls, Kalispell, Whitefish, Polson and Ronan) and one Carbon Monoxide Nonattainment Area (Kalispell) within the Flathead NF area. In order to better understand the extent of existing air quality concerns, we recommend that the Final EIS include a table showing recent monitoring results and current design values for these areas, in comparison to the NAAQS and MAAQS.

Potential Air Quality Impacts

Impacts of Wildfire and Prescribed Fire: The use of prescribed fire can restore ecological function and offer ecological benefits over the use of mechanical treatment techniques. The Draft EIS includes tables showing past and projected average acres per decade of wildfire and prescribed fire for each alternative. This information provides a useful comparison of the relative scale of potential for smoke impacts to air quality among the alternatives. Qualitative discussion of potential impacts is limited to assurance that adverse effects to air quality and AQRVs would be minimized by adherence to required regulations. Given the presence of multiple sensitive air quality locations, including nonattainment areas as well as Class I and sensitive Class II airsheds, we recommend that the Final EIS provide additional information on potential impacts of fire on air quality and AQRVs. Specifically, based on existing air quality and AQRV information requested above, we recommend including a qualitative discussion of pollutants typically emitted by fire, the potential for impacts to existing conditions in sensitive areas and the typical duration of those impacts.

According to the Draft EIS, the USFS participates in the Montana-Idaho Airshed Group for management of prescribed burns. It therefore appears that the prescribed fire design criteria and monitoring will meet requirements that the EPA supports, including: (1) incorporation of the Interagency Prescribed Fire Planning and Implementation Procedures Guide (April 2014) into the site-specific burn plans designed for each prescribed burn conducted under this project; and (2) public notification of pending burns. We also recommend that the USFS consult with the MDEQ for any modeling, mitigation, or other measures required under state regulations or the State Implementation Plan to address CAA requirements. If prescribed fire may impact the Flathead Indian Reservation, we recommend consulting with the Confederated Salish and Kootenai Tribes as well.

(3) Climate Change

The Draft EIS includes a thorough discussion of climate change and ongoing and reasonably foreseeable climate change impacts relevant to the forest. Providing such background information assists with the

identification of potential impacts of activities on the forest that may be exacerbated by climate change, and to inform consideration of measures to adapt to climate change impacts. The USFS has incorporated these types of key considerations throughout the Draft EIS, with each resource-specific analysis including a discussion of potential climate change-related concerns.

The Draft EIS includes two sections addressing the current state of science on climate change and the potential impacts of forest management activities on greenhouse gas (GHG) emissions and climate change. For clarity, we recommend consolidating the climate change information from Section 3.4 Carbon Sequestration and Section 3.9 Air Quality. Emissions estimates, including estimates of emissions resulting from carbon sequestration changes associated with the proposed agency action can serve as a basis for comparison of impacts to potential climate change effects when preparing a NEPA analysis.

We recommend that the Final EIS refer to the *Final Guidance on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* (Guidance)² finalized on August 1, 2016. We note that the final guidance no longer incorporates a numerical threshold for quantitative analysis. According to the Guidance, “When data inputs are reasonably available to support calculations, agencies should conduct GHG analysis and disclose quantitative estimates of GHG emissions in their NEPA reviews.” Example tools for estimating and quantifying GHG emissions can be found on CEQ’s NEPA.gov website.³ We recommend quantifying GHG emissions resulting from the proposal in the Final EIS. These emission levels can serve as a basis for comparison of the alternatives with respect to GHG impacts.

(4) Other Considerations

Oil and Gas Development

According to the Draft EIS, there is no active oil and gas extraction occurring on the Flathead NF. There are currently 341 suspended oil and gas leases in the Flathead NF, but no activity can take place on these leases until a separate oil and gas leasing analysis EIS has been completed. Further, no additional leasing can occur without an oil and gas leasing EIS. While the Draft EIS indicates that an oil and gas leasing analysis is not expected soon, it does not provide any details. When such an analysis commences, we will provide additional recommendations related to analysis and mitigation, including leasing stipulations, for oil and gas operations.

Although there are areas within the Flathead NF classified as high or moderate for oil and gas potential, no estimate of the reasonably foreseeable development (RFD) is included in the Proposed Action. Until an RFD is estimated, it is difficult to definitively identify the appropriate level of air quality analysis. At the outset of the NEPA process for the future oil and gas leasing analysis, the EPA would like to discuss with USFS the air quality impact analyses and appropriate mitigation measures, consistent with the process described in the June 23, 2011 National Memorandum of Understanding regarding air quality analyses and mitigation for federal oil and gas decisions through NEPA.

² *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. August 1, 2016. https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf

³ https://ceq.doe.gov/current_developments/GHG_accounting_methods_7Jan2015.html

Mining

Although mining is not anticipated to be a major use of the Flathead NF, potential environmental effects exist, particularly with regard to risks of mobilization and transport of heavy metals and other pollutants to surface and ground waters. It is therefore important to include appropriate management direction to protect water quality and aquatic resources during mine exploration, development, operation, closure, reclamation, and post-closure. We recommend that the Desired Conditions for locatable and leasable minerals reference the need to protect other resource values and maintain desired conditions for other resources. In addition, while we support the Desired Condition for reclamation of abandoned mine sites where human health risks exist, we also recommend consideration of reclamation of abandoned mine sites to remediate environmental contamination and degradation to fisheries and wildlife.

While guideline FW-GDL-E&M-08 does require “practicable measures to maintain, protect, and rehabilitate water quality...” we recommend providing more detailed direction for protection of water quality in the guidelines. We offer the following suggestions for additional guidelines to protect water quality during development of energy and mineral resources:

- Locate and design mine facilities and mine water management to minimize surface disturbances, control water runoff, minimize erosion and sedimentation, protect hydrologic function and integrity, and prevent the release of acid or toxic or hazardous materials to surface or ground waters.
- Develop inspection, monitoring, and reporting requirements for mineral activities. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases, or permits as needed to eliminate impacts that prevent attainment of watershed, riparian and aquatic habitat and aquatic species desired conditions, and avoid adverse effects on inland native fish and sensitive aquatic species.
- Identify active and abandoned mines on the forest that pose risks of environmental degradation, particularly acid mine drainage or mobilization and transport of toxic or hazardous materials and prioritize those sites for restoration.

Preferred Alternative

The Draft EIS does not identify the USFS’s preferred alternative. We have noticed that since the implementation of the 2012 Forest Planning Rule pre-decisional objection process, occasionally USFS Final EISs have not included identification of the preferred alternative. As required under Section 1502.14 of the Council on Environmental Quality’s Regulations for Implementing the National Environmental Policy Act, the preferred alternative will need to be identified in the Final EIS unless another law prohibits expression of such a preference. It seems reasonable to identify a preferred alternative in the Final EIS to ensure that the public and interested stakeholders have an opportunity to comment through an open notice and public comment period. We recommend that the USFS’s preferred alternative is clearly described in the Final EIS.

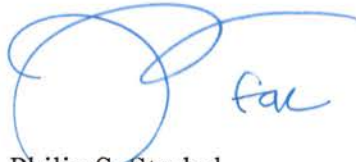
Closing and EPA Rating

Based on our review, the EPA is rating the document and all alternatives as “Environmental Concerns – Insufficient Information” (EC-2). The “EC” rating means that the EPA’s review has identified potential

impacts that should be avoided in order to fully protect the environment, including potential impacts to wetlands and water quality. The "2" rating means that the Draft EIS does not contain sufficient information for the EPA to fully assess environmental impacts. A description of the EPA's rating system can be found at: <http://www2.epa.gov/nepa/environmental-impact-statement-rating-system-criteria>.

We appreciate the opportunity to comment on this document and hope our suggestions will assist you with preparation of the Final EIS. We would be happy to meet to discuss these comments and our recommendations. If you have any questions or requests, please feel free to contact either me at 303-312-6704, or your staff may contact Molly Vaughan, at 907-271-1215 or vaughan.molly@epa.gov.

Sincerely,



Philip S. Strobel
Director, NEPA Compliance and Review Program
Office of Ecosystems Protection and Remediation





United States Department of the Interior

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Office of Environmental Policy and Compliance
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Post Office Box 25007 (D-108)
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September 21, 2016

In Reply Refer To:
9043.1
ER 16/0374

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

Dear Mr. Weber,

This letter is in response to the U.S. Forest Service's June 3, 2016 release of the draft Revised Land and Resource Management Plan (Revised Forest Plan) and Draft Environmental Impact Statement (DEIS) for the Revised Forest Plan. The DEIS also includes proposed forest plan amendments on the Helena-Lewis and Clark, Lolo and Kootenai National Forests that will incorporate relevant management direction from the Northern Continental Divide Ecosystem (NCDE) Grizzly Bear Conservation Strategy (GBCS).

The U.S. Fish and Wildlife Service (USFWS) has reviewed the Revised Forest Plan and DEIS with respect to federally listed threatened or endangered species, and their designated critical habitats. Because a preferred alternative has yet to be identified, it is difficult to provide specific comments in a substantive manner. However, the USFWS is encouraged to see that current management direction and conservation strategies pertaining to listed species that may occur on National Forest System Lands were included in the all action alternatives. For terrestrial species, specifically grizzly bear (*Ursus arctos horribilis*) and Canada lynx (*Lynx canadensis*), direction and strategies include the NCDE GBCS and the Northern Rockies Lynx Management Direction (NRLMD). For aquatic species, specifically bull trout (*Salvelinus confluentus*), these conservation strategies are the Inland Native Fish Strategy (INFISH) and the U.S. Forest Service Bull Trout Conservation Strategy.

While the action alternatives may include deviations from these existing management directions and conservation strategies, the USFWS believes that the intent of these documents is being considered and that the Revised Forest Plan and amendments will continue to conserve listed species and promote their recovery. The USFWS also expects that listed species will be addressed through Section 7 consultation under the Endangered Species Act (ESA) on the Revised Forest Plan and amendments. This intent was formalized in August, 2016 with the signing of a Consultation Agreement between the U.S. Forest Service and the USFWS. As the Forest Plan revision and amendment process continues to develop, the USFWS will remain in

contact with the U.S. Forest Service to ensure that consultation can be completed in a timely manner.

We appreciate the opportunity to comment on the Revised Forest Plan and the Draft Environmental Impact Statement. Further, we continue to acknowledge your efforts to conserve threatened and endangered species by fulfilling your responsibilities under the Endangered Species Act. If you have questions related to these comments or future consultation, please contact Kevin Aceituno at kevin_aceituno@fws.gov or (406) 758-6871, or Katrina Dixon at katrina_dixon@fws.gov or (406) 449-5225 ext.222.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert F. Stewart", with a stylized flourish at the end.

Robert F. Stewart
Regional Environmental Officer

cc: Joe Krueger, Forest Plan Revision Planning Team Lead

**DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION**
Northwestern Land Office



STEVE BULLOCK, GOVERNOR

STATE OF MONTANA

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KALISPELL, MT 59901

October 3, 2016

Mr. Chip Weber, Supervisor
Flathead National Forest Service
650 Wolfpack Way
Kalispell, MT 59901

Re: Montana Department of Natural Resources and Conservation, Trust Land Management and Forestry Division Comments to the Flathead National Forest DEIS

Dear Mr. Weber,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the Flathead National Forest's Plan Revision. We appreciate the Forest's efforts to engage state and local governments and Montana citizens throughout the planning process. The Montana Department of Natural Resources and Conservation's (DNRC) Trust Lands Management and Forestry Divisions are committed to continuing a positive working relationship with the Flathead National Forest, specifically on wildfire response, community protection, sustainable forest management and access. By working together we can more effectively work towards an "all lands" approach to forest and watershed management and restoration benefiting both agency's missions. Our comments reflect our desire to enhance the social and economic needs of our communities, while maintaining and enhancing desired ecological conditions on the ground.

The DNRC's Trust Land Management Division (TLMD), manages approximately 5.2 million surface acres and 6.2 million subsurface acres across the State of Montana. The mission of the TLMD is to manage the state trust timber, surface, and mineral resources for the benefit of the Common Schools and other endowed institutions under the direction of the Board of Land Commissioners (top five elected officials in the State). The DNRC TLMD is divided into the following four programs: agriculture and grazing management, forest management, minerals management, and real estate management. Together these programs generate approximately \$100 million annually for the trust beneficiaries.

The Montana Department of Natural Resources and Conservation (DNRC), Forestry Division, is responsible for planning and implementing forestry and fire management programs through an extensive network of staff located in field offices across the state. The Forestry Division has four major functions: fire & aviation management, forestry assistance, business management, and policy, planning & outreach. Our programs work to maintain and improve the health of Montana's forests, watersheds, and the communities that depend on them while providing resources, leadership and coordination to Montana's wildfire services and landowners.

For the DNRC TLMD and Forestry Divisions to meet their respective missions and work towards an all lands approach to forest management, community protection and watershed restoration we offer the following comments on the FNF DEIS.

Access for Forest Management and impacts to State Trust Lands:

The DNRC supports minimizing road densities to protect and enhance wildlife habitat and improve watershed conditions, where appropriate and where it will help to meet the overall desired future conditions on the Forest. However, we ask that access be maintained in areas that are important for future state trust land management and to ensure that fire response agencies can effectively and safely protect values at risk from wildfires on all lands.

- The majority of state trust lands are considered scattered parcels. Under the Enabling Act of 1889, the U.S. Congress granted to the State of Montana, sections 16 and 36 in every township within the state. In some cases, where sections were already reserved, other lands were selected in lieu of. The scattered nature of many of these lands lends a number of challenges to the DNRC. One of those challenges is gaining reasonable access to state trust lands to conduct activities concurrent with the mission set forth in the Constitution.
- Of the nearly 5.2 million acres of surface land, tens of thousands of acres are landlocked or mostly landlocked by National Forest System Lands and several thousand more rely on transportation systems either wholly or partially owned by the U.S. Forest Service. The majority of these acres are the DNRC's most productive timber ground.
- The DNRC has been operating in good faith with the U.S. Forest Service to gain both permanent and temporary access to state trust lands under the Master Cost-Share Agreement and temporary road use permits. Recently, the agencies have devised an Easement Exchange process as an additional tool to gain reciprocal access across ownerships.
- In the revision of the Flathead National Forest Plan, DNRC requests that the U.S. Forest Service continue to provide reasonable access to state trust lands as guaranteed under the Alaska National Lands Conservation Act [Public Law 96-487, 94 Stat. 2371 (1980)].

DNRC TLMD also requests that the U.S. Forest Service continue to make it a high priority to partner with the State to acquire permanent access under the Master Cost-Share Agreement or the Easement Exchange process.

- When fulfilling Section 7 Consultation requirements under the Endangered Species Act (ESA) for DNRC access projects, please be advised that TLMD has developed a Habitat Conservation Plan (HCP) and acquired an Incidental Take Permit (Permit) under Section 10 of the ESA for 550,000 acres in western Montana. The HCP and the Permit cover forest management activities (including road maintenance, road construction, road reconstruction, and installation of bridges and culverts) where they may affect bull trout, grizzly bear, and Canada lynx, for a Permit term of 50 years (ending in 2063). DNRC requests that the U.S. Forest Service take these documents into account to effectively streamline Section 7 Consultation for all road agreements.
- Current semi-primitive motorized use is facilitating trespass on DNRC lands near Estes Lake and the Strawberry Lake Road. The desired conditions for GA-SV-MA7 – Crane and Krause (pages 151 & 152 of the Draft Revised Forest Plan) would be that existing trails do not facilitate motorized trespass on adjacent state lands.

Access for Fire Suppression and Community Protection:

- Road access is also a primary concern for fire suppression response. Maintaining management flexibility and road access for fire suppression is of particular concern on the Swan face. Without maintaining this road access and/or reducing this access the DNRC envisions less opportunities for managing fires before they reach nearby private lands and lands under DNRC's fire protection.
- DNRC feels that decommissioning roads associated with extending grizzly bear core security and/or proposed wilderness boundaries as described in Alternative C would potentially inhibit rapid initial attack and therefore has negative implications for our collective ability to protect private lands from fire in the Swan Valley.
- We support the Draft Plan's recommended desired conditions of mitigating hazardous conditions on adjacent private land and hope you keep this as a continued focus in the FEIS.

Forest Products/Timber:

The DNRC's Forests in Focus Initiative emphasizes forest restoration and industry retention as a key objective. Restoring forests is not an inexpensive proposition. One of the best ways to offset the high costs of these restoration treatments is through active forest management and producing products with commercial value. This, of course, depends on having a skilled workforce and a purchaser for raw materials. Though there have been several mill closures in Montana in the past decade, the state's remaining logging industry and milling infrastructure is still intact and integrated and a critical partner in meeting the ecological, social and economic components outlined in the Draft FNF Plan.

The DNRC has concerns related to Projected Timber Sale Quantity (PTSQ) and Projected Wood Sale Quantity (PWSQ) as outlined in the DEIS.

- We would like to see clearer definitions of both PTSQ and PWSQ outlined in the FEIS.
- Please be more consistent in the FEIS with your unit of measure for forest products. Either choose board feet or cubic feet or please utilize both units when describing and projecting outputs.
- We appreciate your efforts in Volume 2 Chapter 3 of the DEIS to show average annual PTSQ with and without budget constraints. However, we feel that this distinction needs to be clearer and the discussion strengthened. It appears that the PTSQ number should be based on desired future conditions and resource needs and not solely on budget constraints. While this may be the reality today – to use an annual or biannual administrative constraint to set guidance on the PTSQ for the next 15 years seems short sighted. We recommend the Plan describe the desired condition (preferred alternative) relative to PTSQ as a range with the baseline being the current budget limit and the top being the actual biological sustained yield figures so that as variables change or opportunities emerge the plan doesn't artificially or unintentionally constrain management opportunities.
- The Plan understates the social and economic significance of the Flathead National Forest's timber supply to the local communities and the state of Montana. The FNF's contribution is not just about creating jobs, it's about sustaining an industry that makes it feasible to keep mills operating so other landowners can manage their forests. It also keeps experienced operators and logging equipment around when we need them to fight fires. As managers of the majority share of forested lands within the jurisdiction of the Forest, the FNF has a responsibility to private and other public landowners to actively manage their lands and contribute a proportionate share to the state's timber supply. As an example, state trust lands own less than 4% of the non-reserved timber land in Montana yet account for roughly 18% of the annual volume harvested in the state. Although this volume is critical to industry, it is not enough to sustain it. State trust lands rely on federal partners to actively manage their lands to contribute to the overall volume that can be sold and harvested in the state. Should federal landowners not contribute a proportionate amount, infrastructure is sure to dwindle, thereby limiting the state's ability to meet its obligations to the trust beneficiaries through active forest management and hinders private landowners ability to manage their lands. In short, without consistent supply from the FNF, mills will close, hindering the Forest's ability to reach the desired future conditions you lay out in the Plan. We recommend you strengthen this discussion in the FEIS.

Partnerships and Coordination (P&C)

- Partnerships and coordination are integral in meeting an all lands approach to forest management, community protection and watershed restoration. We agree and applaud the desired conditions under Partnership and Coordination outlined on pages 91-92 of the Draft Plan. We, however, recommend adding a condition specific to partnerships/coordination necessary to increase the pace and scale of restoration, reducing fuels and maintaining a forest products infrastructure. For example, a desired condition could read, "Cooperate and partner with state agencies, federal agencies, tribes, counties and other groups to improve forest health, reduce wildfire risk to communities and increase the pace and scale of restoration across ownerships."

We applaud the FNF for your extensive work on the DEIS, incorporating the best available science and weighing the many interests involved in the Plan development. We appreciate you taking our comments into consideration and for continuing to work alongside the State of Montana for the benefit of our communities, forests, wildlife and watersheds. We look forward to continued engagement as this Plan development moves forward.

Sincerely,



Greg Poncin
Area Manager, Northwest Land Office



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September 30, 2016

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

Re: Flathead National Forest Draft Environmental Impact Statement

Dear Mr. Weber,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement and Revised Forest Plan for the Flathead National Forest. We commend your agency's effort in preparing this document and realize the challenges the Forest Service faces in managing public lands for multiple uses while maintaining fish and wildlife habitat integrity. We support components of Alternatives B and C as they pertain to the conservation of wildlife and wildlife habitat; however, we are not supportive of Alternative A nor D, which we feel would have cumulative negative impacts on sustaining wildlife resources into the future. In general, both Alternative B and C identify areas to be designated as Wilderness, which offers additional long-term protection of natural areas, maintaining essential habitat and minimizing disturbance for wildlife species. This is especially true of species sensitive to human disturbance, primarily motorized vehicle traffic. Therefore, we feel that any areas selected as Recommended Wilderness should retain the qualities pertinent to designated Wilderness; mechanized transport and motorized travel should be prohibited. Motorized travel can displace wildlife from important habitat areas, thus reducing habitat value (Proffitt et al. 2016). Mechanized travel, most typically in the form of mountain biking, often results in negative encounters with grizzly bears and can lead to human injury or fatalities (Coltrane and Sinnott 2015). Although designating areas as Recommended Wilderness may offer the greatest long-term protection of natural areas, it does limit habitat management options. Should all the areas identified as Recommended Wilderness in Alternatives B and C not be selected, we recommend that they remain closed to motorized vehicles year-round. In core or limited habitats occupied by species particularly sensitive to motorized travel (i.e., mountain goats and wolverines), we also recommend considering year-round nonmotorized use.

We applaud the Forest Service for the creation of the Riparian Management Zone (RMZ) and support the associated 300-ft buffer zone around fish-bearing streams, ponds, wetlands, and lakes. Maintaining large areas of undisturbed habitat adjacent to water bodies supports terrestrial habitat for amphibians and other wetland-dependent species (Castell et al. 1992, Calhoun and Klemens 2002). These buffers also function to provide essential habitat for species of management concern. The promotion of large old-growth trees,

especially red cedar and cottonwood, within the RMZs will help to maintain potential fisher habitat should efforts be made to reestablish fisher populations, as well as other species associated with old growth. Limiting trail development in RMZs may reduce human-grizzly bear conflicts, as grizzly bears select and frequent these habitat types.

We support the removal of criteria to retain 70% of canopy cover for white-tailed deer winter range. Although maintaining canopy cover, as snow intercept, is essential on white-tailed deer winter range, this habitat must account for other needs such as forage. Maintaining flexibility in management strategies that provide for all the habitat needs of white-tailed deer on winter range may be beneficial over the long term. We recommend that the Forest Service collaborate with FWP to evaluate individual timber and habitat management efforts as they arise. Similarly, we recommend that the Forest Service collaborate with FWP concerning any management efforts that may impact elk habitat, as well. The Forest Plan specifically identifies two elk winter ranges, the South Fork/Spotted Bear area and the Firefighter area, near Hungry Horse. While these are two known wintering areas for elk on Flathead National Forest, there are other areas within the forest that support smaller groups of winter elk. For example, areas in the Swan Valley provide winter range for elk, and the winter requirements for elk in these areas should be considered in timber harvest or habitat management projects. In addition, recent research has emphasized the importance for summer elk habitat quality in relation to production and survival (Cook et al. 2013, Proffitt et al. 2016). As more site-specific research becomes available, we recommend that the Forest Service consider summer elk ranges when applying forest treatments.

Mountain goat numbers on the Forest are significantly lower than historic levels. While harvest opportunity has been dramatically reduced in recent years, there does not appear to be an increase in population numbers. Anthropogenic activity can have significant cumulative impacts on mountain goats, and therefore we support restrictions that limit disturbance to mountain goats year-round, and particularly during the winter or kidding period. Overland motorized activity and rotary-wing aircraft negatively impact mountain goats, and the Forest Plan restricts disturbance, particularly helicopter activity (Foster and Rahe 1983, Cote et al. 2013, St-Louis et al. 2013), in and adjacent to kidding areas from December to July. We recommend that this restriction be extended to mid-July to completely avoid the kidding period.

Mule deer numbers in Northwest Montana have been in decline for over a decade (especially mule deer populations that winter in forested habitats), but FWP is unsure as to what is driving the population reduction. It is possible that mule deer habitat is limiting, as mule deer in this area occupy habitat atypical to other parts of the state; however, there are virtually no data concerning mule deer habitat selection and use in the region. FWP will be conducting a research project in order to obtain data on mule deer demography, movement, and habitat selection patterns in Northwest Montana. As these data become available, we recommend that the Forest Service work with FWP to revise the Forest Plan to conserve important mule deer habitat.

The attention to restoring whitebark pine that is outlined in the plan is commendable. In relation to whitebark pine restoration, we believe Alternative B allows for restoration activities, but still offers sufficient habitat protection for species sensitive to motorized and mechanized use in terms of Recommended Wilderness.

Finally, components of Alternatives B and C ensure the continued conservation and recovery of grizzly bears in the Northern Continental Divide Ecosystem (NCDE) and meet delisting criteria. FWP supports those actions that meet or exceed the guidelines identified in the NCDE Grizzly Bear Conservation

Strategy. Elements of Alternative C extend primary conservation area (PCA) protections to areas outside the PCA. These recommendations may provide additional protection for grizzly bears in terms of increased road restrictions and secure habitat, but they exceed the guidelines established in the conservation strategy and may reduce flexibility in managing habitat for other species. We encourage the Flathead National Forest to select components of both Alternative B and C that minimize potential for human-bear conflicts, yet maintain management flexibility when considering habitat needs of other wildlife species. Alternative C includes a provision for conservation and consolidation of blocks of particularly important habitat through conservation easement, land exchange, or fee title purchase. We support those efforts, which will not only benefit grizzly bears, but other wildlife species. In addition, we continue to support the implementation of forest-wide food storage restrictions.

Thank you for considering our comments on the DEIS. We look forward to working with the Flathead National Forest on future projects.

Sincerely,



Neil Anderson
R1 Wildlife Manager

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September 30, 2016

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

Re: Flathead National Forest Draft Environmental Impact Statement

Dear Mr. Weber,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement and Revised Forest Plan for the Flathead National Forest. We commend your agency's effort in preparing this document and realize the challenges the Forest Service faces in managing public lands for multiple uses while maintaining fish and wildlife habitat integrity. In addition, we support the Flathead National Forest's commitment to addressing the growing demand for front country recreation in the region.

We support components of Alternatives B and C as they pertain to the conservation of wildlife and wildlife habitat, as well as components of Alternatives B, C, and D that emphasize expanded focused recreation area development (MA7) in areas that will not significantly impact critical wildlife habitat and can be mitigated for impacts on wildlife and wildlife-human conflicts. Both Alternative B and C identify areas to be designated as Wilderness, which offers additional long-term protection of natural areas, maintaining essential habitat and minimizing disturbance for wildlife species. This is especially true of species sensitive to human disturbance, primarily motorized vehicle traffic. Motorized travel can displace wildlife from important habitat areas, thus reducing habitat value (Proffitt et al. 2016). Mechanized travel, most typically in the form of mountain biking, often results in negative encounters with grizzly bears and can lead to human injury or fatalities (Coltrane and Sinnott 2015). In areas where mechanized or motorized use currently exists, we recommend evaluating the potential impacts of these activities on wildlife and wildlife-human conflicts. Although designating areas as Recommended Wilderness may offer the greatest long-term protection of natural areas, it does limit habitat management options. Should all the areas identified as Recommended Wilderness in Alternatives B and C not be selected, we recommend that they remain closed to motorized vehicles year-round. In core or limited habitats occupied by species particularly sensitive to motorized travel (i.e., mountain goats and wolverines), we also recommend considering year-round nonmotorized use.

We applaud the Forest Service for the creation of the Riparian Management Zone (RMZ) and support the associated 300-ft buffer zone around fish-bearing streams, ponds, wetlands, and lakes. Maintaining large areas of undisturbed habitat adjacent to water bodies supports terrestrial habitat for amphibians and other wetland-dependent species (Castell et al. 1992, Calhoun and Klemens 2002). These buffers also function to provide essential habitat for species of management concern. The promotion of large old-growth trees,

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especially red cedar and cottonwood, within the RMZs will help to maintain potential fisher habitat should efforts be made to reestablish fisher populations, as well as other species associated with old growth. Limiting trail development in RMZs may reduce human-grizzly bear conflicts, as grizzly bears select and frequent these habitat types.

We support the removal of criteria to retain 70% of canopy cover for white-tailed deer winter range. Although maintaining canopy cover, as snow intercept, is essential on white-tailed deer winter range, this habitat must account for other needs such as forage. Maintaining flexibility in management strategies that provide for all the habitat needs of white-tailed deer on winter range may be beneficial over the long term. We recommend that the Forest Service collaborate with FWP to evaluate individual timber and habitat management efforts as they arise. Similarly, we recommend that the Forest Service collaborate with FWP concerning any management efforts that may impact elk habitat, as well. The Forest Plan specifically identifies two elk winter ranges, the South Fork/Spotted Bear area and the Firefighter area, near Hungry Horse. While these are two known wintering areas for elk on Flathead National Forest, there are other areas within the forest that support smaller groups of winter elk. For example, areas in the Swan Valley provide winter range for elk, and the winter requirements for elk in these areas should be considered in timber harvest or habitat management projects. In addition, recent research has emphasized the importance for summer elk habitat quality in relation to production and survival (Cook et al. 2013, Proffitt et al. 2016). As more site-specific research becomes available, we recommend that the Forest Service consider summer elk ranges when applying forest treatments.

Mountain goat numbers on the Forest are significantly lower than historic levels. While harvest opportunity has been dramatically reduced in recent years, there does not appear to be an increase in population numbers. Anthropogenic activity can have significant cumulative impacts on mountain goats, and therefore we support restrictions that limit disturbance to mountain goats year-round, and particularly during the winter or kidding period. Overland motorized activity and rotary-wing aircraft negatively impact mountain goats, and the Forest Plan restricts disturbance, particularly helicopter activity (Foster and Rahe 1983, Cote et al. 2013, St-Louis et al. 2013), in and adjacent to kidding areas from December to July. We recommend that this restriction be extended to mid-July to completely avoid the kidding period.

Mule deer numbers in Northwest Montana have been in decline for over a decade (especially mule deer populations that winter in forested habitats), but FWP is unsure as to what is driving the population reduction. It is possible that mule deer habitat is limiting, as mule deer in this area occupy habitat atypical to other parts of the state; however, there are virtually no data concerning mule deer habitat selection and use in the region. FWP will be conducting a research project in order to obtain data on mule deer demography, movement, and habitat selection patterns in Northwest Montana. As these data become available, we recommend that the Forest Service work with FWP to revise the Forest Plan to conserve important mule deer habitat.

The attention to restoring whitebark pine that is outlined in the plan is commendable. In relation to whitebark pine restoration, we believe Alternative B allows for restoration activities, but still offers sufficient habitat protection for species sensitive to motorized and mechanized use in terms of Recommended Wilderness.

Finally, components of Alternatives B and C ensure the continued conservation and recovery of grizzly bears in the Northern Continental Divide Ecosystem (NCDE) and meet delisting criteria. FWP supports those actions that meet or exceed the guidelines identified in the NCDE Grizzly Bear Conservation

Strategy. Elements of Alternative C extend primary conservation area (PCA) protections to areas outside the PCA. These recommendations may provide additional protection for grizzly bears in terms of increased road restrictions and secure habitat, but they exceed the guidelines established in the conservation strategy and may reduce flexibility in managing habitat for other species. We encourage the Flathead National Forest to select components of both Alternative B and C that minimize potential for human-bear conflicts, yet maintain management flexibility when considering habitat needs of other wildlife species. Alternative C includes a provision for conservation and consolidation of blocks of particularly important habitat through conservation easement, land exchange, or fee title purchase. We support those efforts, which will not only benefit grizzly bears, but other wildlife species. In addition, we continue to support the implementation of forest-wide food storage restrictions.

Thank you for considering our comments on the DEIS. We look forward to working with the Flathead National Forest on future projects.

Sincerely,



for Jim Williams
Regional Supervisor



Dave Landstrom
Regional Parks Manager

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Montana Fish, Wildlife & Parks

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Helena, MT 59620-0701
406-444-3186
FAX: 406-444-4952
Ref: DO281-16

October 3, 2016

Joe Krueger, Forest Planner
Supervisor's Office
Flathead National Forest
Attn: Forest Plan Revision
650 Wolfpack Way
Kalispell, MT 59901

*Submit comments via: flatheadplanrevision@fs.fed.us
and <https://cara.ecosystem-management.org/Public/CommentInput?Project=46286>*

Subject: NCDE Grizzly Bear Conservation Strategy Amendments (Volume 3--DEIS for the Forest Plan Amendments to incorporate relevant direction from the NCDE [Draft] Grizzly Bear Conservation Strategy for the Helena, Kootenai, Lewis & Clark, and Lolo National Forests)

Dear Mr. Krueger:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS, Volume 3) for the Forest Plan Amendments to incorporate relevant direction from the Northern Continental Divide Ecosystem (NCDE) Draft Grizzly Bear Conservation Strategy (GBCS). Montana Fish, Wildlife & Parks (MFWP¹) fully appreciates the effort that has gone into preparing this document and the challenges the US Forest Service (USFS) faces in managing for multiple uses while maintaining viable and secure grizzly bear habitat. The following comments are restricted to the Kootenai, Helena, and Lolo National Forest (NF) sections of the GBCS DEIS, portions of which fall within the management authority of the MFWP Region 1 (Kalispell) and/or 2 (Missoula) offices of MFWP.

ALTERNATIVES

Generally MFWP supports Alternative 2--the USFS's "proposed action modified"--and believes it provides adequate habitat protections for grizzly bears in both Zone 1 and demographic connectivity areas (DCAs), while managing for other wildlife species and multiple uses by the public. However, by also incorporating a modification taken from Alternative 3, we believe Alternative 2 would align better with the Draft NCDE GBCS and provide reasonable protections

¹ Montana Fish, Wildlife & Parks normally abbreviates its name as FWP, but we are using MFWP in this letter to maintain consistency with the USFS's GBCS Amendment documents.

for grizzly bears that would allow for occupancy as well as connectivity to other ecosystems, while still managing for other wildlife species and multiple uses by the public.

Alternative 3 in its complete form would add additional protections to the primary conservation area (PCA) and essentially extend many of the more stringent protections within the PCA to Zone 1 and the Ninemile DCA. Alternative 2 does maintain existing recreational facilities and motorized road and trail density and allows for less stringent regulations on timber harvest and recreation. With conditions as they are now, we are observing an expanding bear population. Although Alternative 3 would provide for greater protection of grizzly bears and grizzly habitat, the majority of the changes in Alternative 3 may not be essential. Therefore MFWP supports Alternative 2--but we believe that a modification from Alternative 3 should be incorporated into Alternative 2.

Recommended Modification to Alternative 2

MFWP recommends modifying Alternative 2 to add desired condition (DC) components NCDE-KNF Zone 1-DC-02 (Appendix 7, page 7-17), NCDE-HNF Zone 1&2-DC-02 (Appendix 7, p 7-3), and NCDE-LNF Zone 1-DC-02 (Appendix 7, p 7-35) from Alternative 3 for (respectively) the Kootenai, Helena, and Lolo NFs.

These desired conditions would encourage the National Forests to look for opportunities to consolidate and seek out conservation easements on important blocks of habitat. In order to allow for occupation and connectivity to the Greater Yellowstone Ecosystem (GYE) and other ecosystems we feel it is important that the forest plans have the components that recognize the importance of forest lands to the expanding grizzly population. These added measures would supply the adequate habitat protection needed to facilitate and manage, into the future, the movement of grizzly bears between the NCDE's PCA, Zone 1, and Zone 2, and the GYE. This additional protection taken from Alternative 3 for desired conditions would encourage the NFs to look for opportunities to consolidate and seek out conservation easements on private lands to create blocks of USFS lands in and around important linkage habitat.

MFWP has supported and continues to support efforts to maintain or improve habitat conditions for wildlife through the use of conservation easements, consolidation of small blocks of habitat to form larger areas protected from development, or purchase of important habitats for wildlife and the public. We look forward to working with the National Forests to identify key areas where large blocks of intact habitat can: be maintained for wildlife including grizzly bears, enhance connectivity between occupied grizzly bear habitats, and maintain public access to these areas.

SPECIFIC DOCUMENT COMMENTS

MFWP offers the following comments or suggestions specific to portions of the Amendment documents.

Kootenai NF (Region 1 MFWP)

1. On page 55 in the “Motorized route density outside the recovery zone” section of “Alternative 1--no action, Kootenai National Forest” of the DEIS (Vol 3, Ch 6.5.5), the statement “To date, there are no records of female bears denning outside of the recovery zone” is no longer true. MFWP now has documentation of at least one female with cubs denning in what is proposed to be Zone 1 in the DEIS.
2. On page 60 in the “Developed recreation sites” section of “Alternative 2--proposed action modified, Kootenai National Forest” of the DEIS (Vol 3, Ch 6.5.5), MFWP supports the proposal to limit the number of new, developed recreation sites per bear management unit to no more than one per decade. However, we recommend that all new and existing recreation sites have permanent bear-resistant storage containers installed to improve compliance with food storage orders.
3. On page 6-29 of Appendix 6 (“Kootenai National Forest--Zone 1” section of “Kootenai National Forest Proposed Amendment Direction”), MFWP supports managing to the Standard of KNF Zone 10-STD-01 and KNF Zone 1-STD-WL-02 of no increase in permanent linear miles of open or total roads within the bears outside recovery zone polygons. Grizzly bears and other wildlife--elk in particular--have demonstrated an avoidance of open roads. Managing for no increase in open roads minimizes future impact to habitat and habitat use by wildlife.

Helena and/or Lolo NFs (Region 2 MFWP)

1. On page 22 of the DEIS (Vol 3, Ch 5.6.5 “Alternatives considered but eliminated from detailed study”), the inclusion of the Beaverhead-Deerlodge National Forest (BDNF) was eliminated from further study. MFWP recommends that the USFS not totally exclude mention of the BDNF in this forest amendment process. MFWP suggests language be added into this forest amendment process stating, “The absence of the BDNF has the potential of creating inconsistency in habitat management between the NCDE and the GYE; therefore, it is recommended that any further study and future management direction adhere closely to the amendments adopted by the Helena National Forest.”
2. MFWP also recommends that the USFS have more discussion in this forest amendment on female grizzly bear occupancy in Zone 2. MFWP R2 has verified the presence of female occupancy in several portions of Zone 2, and additional female occupancy is expected. Female occupancy within the Ninemile DCA and the Salish DCA is expected to occur and will be managed at low densities. But, as stated in the “Identify an additional demographic connectivity area on the Helena National Forest” section of the DEIS (Vol 3, Ch 5.6.5 “Alternatives considered but eliminated from detailed study,” p 20), no management for female occupancy will be addressed within the forest amendment--because under the recommendations of the Draft GBCS document, Zone 2 is to provide habitat conditions “that allow male bears to move through and infuse genetic diversity in the Greater Yellowstone Ecosystem.” We understand that the HNF is following the lead and recommendations of the strategies document, but we encourage the reviewers to include a statement in the final amendment that” female occupancy is

expected” to occur at lower densities in Zone 2 and that “recommendations are pending.” MFWP will also encourage the GBCS document reviewers to not totally exclude the fact that female grizzlies will occur and set up home ranges within Zone 1 territories. MFWP hopes that the final draft of the GBCS document would offer guidance for the HNF and BDNF for addressing female grizzly bear occupancy in Zone 2.

Kootenai, Helena, and Lolo NFs

1. On page 19 in the “Add a rest period following temporary decrease in secure core” section of the DEIS (Vol 3, Ch 5.6.5 “Alternatives considered but eliminated from detailed study”), the document states, “grizzly bears are known to have cubs at an earlier average age (4 years old) in the NCDE.” Although there are cases of grizzly bears having cubs at an age of 4, Costello et al. (2016) determined that the mean age of first reproduction was 5.8 (95% CI 5.3-6.3). This finding differs from the information presented in the DEIS, but MFWP does not feel it has bearing on securing core habitat areas, and that information could be removed from the document. We also agree that the concept of providing a rest period in order to secure core habitat was based on earlier work and concerns regarding possibly limited grizzly bear habitat. MFWP believes Alternatives 2 and 3 adequately address habitat concerns outside of the recovery area.
2. On page 41 in the “Grizzly bear response to human activities” section of “Affected Environment” in the DEIS (Vol 3, Ch 6.5.5 “Grizzly bear” in “Affected Environment and Environmental Consequences for the Forest Plan Amendments”), in reference to apiaries (honey bees) utilizing national forest lands, MFWP suggests requiring anyone using Forest Service land to raise bees be required to install electric fencing consistent with the recommendations posted on the MFWP web site (<<http://MFWP.mt.gov/fishAndWildlife/livingWithWildlife/beBearAware/bearAwareTools.html>> Accessed 29 Sep 2016).

CONTACTS

For further consultation regarding grizzly bear information, please feel free to contact the following MFWP personnel:

Kootenai NF areas

Neil Anderson, Wildlife Manager, Region 1 MFWP at Kalispell, phone 406-751-4585, nanderson@mt.gov

Helena and Lolo NF areas

Jamie Jonkel, Wildlife Management Specialist, Region 2 MFWP at Missoula, phone 406-542-5508, jajonkel@mt.gov

CONCLUSION

MFWP appreciates the opportunity to comment on the grizzly bear Forest Plan Amendments and looks forward to working with the National Forests when developing individual projects. We believe Alternative 2, with the modification recommended in our letter, provides adequate

protection to grizzly bears and grizzly bear habitat outside of the primary recovery area. We also support all the National Forests in the implementation of forest-wide food storage restrictions and have implemented those same restrictions on MFWP property within the area.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Sihler". The signature is fluid and cursive, with the first name "Paul" and last name "Sihler" clearly distinguishable.

Paul Sihler
Chief of Staff

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C: Deb O'Neill, FWP RMU
M. Jeff Hagener, FWP Director

Flathead County
Board of Commissioners

(406) 758-5503

Pamela J. Holmquist
Gary D. Krueger
Philip B. Mitchell



October 3, 2016

Flathead National Forest Service
Attn: Stacy Allen
650 Wolfpack Way
Kalispell, Montana 59901

RE: Flathead National Forest Plan Revision

Dear Ms. Allen,

The Flathead National Forest is approximately 2.4 Million acres. A forest plan revision was initiated in the fall of 2013. There have been numerous public meetings, field trips, interagency meetings and over 20,000 comments during the 70 day comment period on the detailed proposed action.

Each alternative has its pros and cons. The commission is leaning toward Alternative D which emphasizes a more active management approach. The bigger question is no matter which alternative is adopted the forest service will still have to overcome litigation obstacles from groups and individuals that oppose logging and fuel reduction projects on our forests as a management tool. Until this can be addressed we will continue to have catastrophic wildfires, mill closures, decreased access and unhealthy forests.

Thank you for the opportunity to comment on the Flathead National Forest Service land and resource management plan revision.

Sincerely,
BOARD OF COMMISSIONERS
FLATHEAD COUNTY, MONTANA

Handwritten signature of Pamela J. Holmquist in cursive script.
Pamela J. Holmquist, Chairman

Handwritten signature of Philip B. Mitchell in cursive script.
Philip B. Mitchell, Member

Handwritten signature of Gary D. Krueger in cursive script.
Gary D. Krueger, Member



LAKE COUNTY

106 4th Ave. E.

lakecommissioners@lakemt.gov

Polson, Mt. 59860

September 28, 2016

Mr. Chip Weber
Flathead National Forest Supervisor
650 Wolfpack Way
Kalispell, MT 59901

RE: Comments on Revised Flathead National Forest Plan

Dear Mr. Weber,

Lake County government would like to submit the following comments related to the Revised Flathead National Forest Plan. Our comments are related only to those Flathead National Forest Lands that lie within the boundaries of Lake County, namely, a portion of the Swan River Corridor.

Our primary areas of interest in the draft plan are those sections that address designated wilderness areas, timber harvest, recreational opportunities, roadless areas, and public safety.

The bulleted list below summarizes our position on the draft plan:

- We do not support any alternative that creates additional acres designated as wilderness or wilderness management areas. Additional wilderness areas do not allow for the use of many forest management tools and also limits a broad number of recreational opportunities.
- We support timber harvest alternatives that provide for the highest amount of timber production and the most acres designated as suitable for timber harvest. Lands suitable for timber harvest should include activities such as firewood gathering and post and pole production. Opportunities for local firewood gathering provide heat for the majority of local homes and supports citizens in managing their household budgets. These activities help support the economy of Lake County. Timber harvest for fire management purposes is also important to our local economy and forest health.
- We support no change to the miles of mechanized trails, miles of wheeled motorized trails, over snow miles, hiking or stock trail miles. Recreation and diverse recreational opportunities are significant drivers of the Lake County economy. Reducing the diverse accessibility to forest land would reduce the number of recreational dollars flowing into Lake County's economy.
- The number of road less miles in the National Forest must not be reduced. Reduction would lead to extended periods of time to render emergency services and an inability to effectively suppress wildfires. It also increases the cost of future timber or timber management. Addressing stream crossing issues improves riparian habitat without a significant impact upon other forest management tools.
- In the event forest management is undertaken by alternate entities like state, local or tribal governments, such management will be in accordance with the Flathead National Forest plan. Other management plans will not direct management of the Flathead Forest except for consistency reviews. No local, state, tribal or other contract hiring, or use preferences will occur.


William D. Barron, Chair, Lake County Commissioners

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**Lake County
Conservation
District**

64352 US Highway 93
Ronan, Montana 59864-8738
Phone: 406-676-2842, ext.102

9/20/2016

Joe Krueger-Forest Plan Revision Planning Team Leader
650 Wolfpack Way
Kalispell, MT 59901

Dear Joe,

In revising the management plan for the Flathead National Forest, NFMA allows the Forest Service to balance and hear different interests of potential user groups. The Lake County Conservation District (LCCD) is a governmental subdivision of the state of Montana and a public body, corporate and politic, exercising public powers. Mont. Code Ann. § 76-15-215. A portion of the Flathead National Forest (173,500 acres) is located within the boundaries of the LCCD. Forest management, including timber harvest and forest fuels reduction, is important to the LCCD. The LCCD is authorized by state law to cooperate and enter into agreements with the United States on federal projects within district boundaries. Mont. Code Ann. § 76-15-403(5).

While NFMA does not explicitly authorize the Secretary of Agriculture to enter into an agreement or lease with a local government entity relative to the forest management, the LCCD believes that the revised Flathead National Forest Plan should recognize that upon the explicit consent of Congress, certain defined forest management activities may be delegated, retaining in the United States its ownership of the public land, through lease or agreement to a state or local government entity in Montana.

LCCD suggests that the "Purpose" section of the Plan (page 2/3) be revised to recognize that project or activity decisions need to be made following appropriate procedures "or with the consent of Congress."

Thank you,

Jim Simpson
Chairman, Lake County Conservation District

rec. 9/21/16



September 29, 2016

CAPS OG -17 - 06

Mr. Chip Weber, Supervisor
Flathead National Forest
650 Wolfpack Way
Kalispell, MT 59901

RE: Flathead Forest Plan Revision

Dear Mr. Weber,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the Flathead National Forest's Plan Revision (the Plan), as well as your efforts to engage local government throughout the process. The Missoula County Commissioners and staff would especially like to thank you for attending the meeting hosted by the Swan Valley Community Council on September 7th, 2016. It was very helpful for the citizens of the Valley to have Joe Krueger and other staff give a history of the plan and explain the document's goals and objectives and how the Forest and public reached this draft proposal. While the comments and suggestions you will receive from the citizens who attended that presentation may appear less formally organized and may be fewer in number than those of the well-funded and staffed organizations represented at the meeting, the citizens hope, and we agree, that you will weigh their comments appropriately. One of the most significant concerns voiced at that meeting was for the safety of citizens when wildfires burn into the Valley. Residents and visitors understandably worry that some land use designations may not provide the Forest with the tools and flexibility needed to respond appropriately. This is their community and their home and they care deeply about the safety of residents and fire fighters, and about the social and economic impacts of the Plan.

The draft forest plan (the Plan) has many implications for natural resources and our communities. Missoula County is committed to partnerships that improve land and resource management and enhance the safety of our communities, regardless of land ownership. We have reviewed the DEIS for the Plan as well as potential modified versions. With some exceptions, the overall direction of the Plan appears to be consistent with the vision of the 2016 Missoula County Growth Policy as well as the Swan Valley-Condon Comprehensive Plan Amendment.

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However, we also wish to take this opportunity to provide additional information and offer suggestions for improvement as outlined below which better reflect our planning documents, our policies and community values.

The lack of mention of Missoula County in the Plan's sections on social, economic, cultural and historical resources should be corrected. Timber harvest is economically and culturally important to Missoula County's Swan Valley and the Valley continues to host businesses utilizing wood products and families who make their living in the timber industry. Consequently, Missoula County should be listed as one of the counties that contain timber-related industries. In addition, the Plan also neglects to include Missoula County in the section on wildlife-related activities which are integral to the history and economic vitality of this portion of Missoula County. And, as you have heard in public meetings, the Missoula County portion of the Swan Valley, which is dominated by Forest Service managed lands, contains schools, both private and public, as well as historic lodges, old logging camp schools and a community hall that merit mention in the Plan's cultural and historical resources section. Such historic buildings and educational facilities are a critical component of the community, a community which supplies both forest workers and fire fighters for Forest Service projects.

While the impacts of any forest plan on natural resources in Missoula County are obvious, we also want to emphasize the Plan's implications to our communities when forest plans are adopted. There is direction in our Growth Policy focused on sustaining and promoting land and resource based industries. The need for an "all lands" approach, one that integrates all land ownerships, must continue to be emphasized. The Forest's responsibility to mitigate hazardous conditions adjacent to private land, as is noted in one of the draft plan recommended desired conditions, must also continue to be stressed.

It is also important to the economic viability of the Swan Valley that timber harvest continue in a sustainable manner, balancing the need for better managed forests with the need for retaining important wildlife habitat. Several statements reflecting desired conditions in the draft Plan identify specific challenges and changes in the Swan Valley. However, thousands of acres in the Valley were recently transferred from The Nature Conservancy to the Flathead Forest through the Legacy Project and it is important that there be direction in the Plan that better addresses this land ownership change in the Swan. The Plan should suggest alternative methods of managing these Legacy lands to benefit the people and natural resources of the Valley.

Aspects of the draft Plan emphasize greater flexibility for management actions, especially in riparian areas where buffer size would increase in some cases but be delineated into areas that would allow active management and resource protection as well. We support increased flexibility for land managers while concurrently protecting important species such as bull trout and westslope cutthroat trout. One key aspect of ensuring that these proposed management options are beneficial is regular monitoring. As a result, we support the draft plan's emphasis on

monitoring which includes identified indicators and the requirement for biennial monitoring reports.

The Missoula County Growth Policy emphasizes the importance of fish and wildlife to the Valley, the County, the region and the nation. We have previously expressed our support of the Northern Continental Divide Ecosystem (NCDE) Grizzly Bear Conservation Strategy, and as such we are glad to see its standards and guidelines included in the draft plan. This is an important step towards the full recovery of grizzly bears in the NCDE.

Again, thank you for the invitation to comment on the Plan. Involving the public and local government in the planning process is a crucial element of successful resource management. Missoula County sincerely appreciates your efforts to attain this goal and looks forward to further continued active participation in your planning process.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patrick O'Herren", with a stylized flourish at the end.

Patrick O'Herren
Chief Planning Officer

Cc: Board of County Commissioners

Glossary

Note:

- Definitions specific to the Northern Rockies Lynx Management Direction are in appendix A of the forest plan.
- Terms and definitions applicable only within the delineated Northern Continental Divide Ecosystem grizzly bear management zones (see forest plan standard FW-STD-WL-01) are indicated by [NCDE] following the definition.

2012 planning rule Direction that sets forth process and content requirements to guide the development, amendment, and revision of land management plans to maintain and restore National Forest System land and water ecosystems while providing for ecosystem services and multiple uses, effective May 9, 2012 (36 CFR§ 219).

activity area A land area affected by a management activity to which soil quality standards are applied. An activity area must be feasible to monitor and includes harvest units within timber sale areas, prescribed burn areas, grazing areas, or pastures within range allotments, riparian areas, recreation areas, and alpine areas. Temporary roads, skid trails, and landings are considered to be part of an activity area.

adaptive capacity (ecology) The ability of a plant, species, or system to adjust to changes in conditions and stresses (i.e., climate change) by moderating potential damages, taking advantage of opportunities, or coping with the consequences.

adaptive management The general framework encompassing the three phases of planning: assessment, plan development, and monitoring (36 CFR § 219.5). This framework supports decisionmaking that meets management objectives while simultaneously employing a monitoring process that accrues information to improve future management by adjusting the plan or plan implementation. Adaptive management is a structured, cyclical process for planning and decisionmaking in the face of uncertainty and changing conditions. It incorporates feedback from monitoring to actively test assumptions, track relevant conditions over time, and measure management effectiveness.

administrative site A location or facility constructed for use primarily by government employees to facilitate the administration and management of public lands. Examples on National Forest System lands include, but are not limited to, ranger stations, warehouses, and guard stations. [NCDE]

administrative use A generic term for authorized agency activity. Specifically, in the portion of the Northern Continental Divide Ecosystem for grizzly bears mapped as the primary conservation area, motorized use of roads closed to the public is permitted for Federal agency personnel or other personnel authorized to perform duties by appropriate agency officials, as long as doing so does not exceed either six trips (three round trips) per week *or* one 30-day unlimited use period during the non-denning season (see also **non-denning season**). [NCDE]

aerial retardant avoidance area A mapped avoidance area on National Forest System lands to protect resources. Avoidance areas include aquatic avoidance areas (minimum of a 300-foot buffer), terrestrial avoidance areas, and cultural resources, including historic properties,

traditional cultural resources, and sacred sites. Refer to the Implementation Guide for Aerial Application of Fire Retardant (USDA, 2015) and avoidance area maps (USDA, 2016).

amendment 19 (pertains to alternative A only) An amendment to the Flathead National Forest plan adopted in 1995 that established allowable sale quantity and objectives and standards for grizzly bear habitat management.

amendment 21 (pertains to alternative A only) An amendment to the Flathead National Forest plan adopted in 1999 that established management direction related to old-growth forests.

amendment 24 (pertains to alternative A only) An amendment to the Flathead National Forest plan adopted in 2006 that established the winter motorized recreation plan.

animal unit month The amount of dry forage required by one mature cow of approximately 1,000 pounds or its equivalent for one month, based on a forage allowance of 26 pounds per day.

attractant A substance that attracts grizzly bears and other wildlife. This includes human food or drink (canned, solid, or liquid), livestock feed (except baled or cubed hay without additives), pet food, and garbage. [NCDE]

baseline The baseline for the Northern Continental Divide Ecosystem is defined as conditions as of December 31, 2011, as modified by changes in numbers that were evaluated and found to be acceptable through the Endangered Species Act section 7 consultation with USFWS while the grizzly bear was listed as threatened. The baseline will be updated to reflect changes allowed under the standards and guidelines. [NCDE]

bear management subunit An area of a bear management unit, in the portion of the Northern Continental Divide Ecosystem for grizzly bears mapped as the primary conservation area, representing the approximate size of an average annual female grizzly bear home range (e.g., 31-68 square miles (Mace & Roberts, 2012)). [NCDE]

bear management unit An area about 400 square miles, in the portion of the Northern Continental Divide Ecosystem for grizzly bears mapped as the primary conservation area, that meets yearlong habitat needs of both male and female grizzly bears. [NCDE]

best management practice (BMP) The method(s), measure(s), or practice(s) selected by an agency to meet its nonpoint source control needs. Best management practices include but are not limited to structural and nonstructural controls and operation and maintenance procedures. Best management practices can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (36 CFR § 219.19).

biodiversity The variety and abundance of plants, animals, and other living organisms as well as the ecosystem processes, functions, and structures that sustain them. Biodiversity includes the relative complexity of species and communities across the landscape at a variety of scales, connected in such a way that provides for the genetic diversity to sustain a species over the long term.

biological assessment A document prepared by a department or agency of the United States proposing to authorize, fund, or carry out an action under existing authorities to determine whether such action is likely to adversely affect listed species, proposed species, or designated critical habitat. A biological assessment document facilitates compliance with the Endangered Species Act.

biological evaluation A review of planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened, proposed, or sensitive species and documentation of the findings (Forest Service Manual 2672.4).

biological opinion A document stating the opinion of a Federal agency, e.g., the U.S. Fish and Wildlife Service, on whether or not a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat.

biophysical settings A grouping of potential vegetation types based on broad climatic and site conditions such as temperature and moisture gradients. See also **broad potential vegetation type**.

board foot A unit of measurement represented by a board one foot square and one inch thick.

boneyard An established site that is used repeatedly by a grazing permittee for disposing of entire animal carcasses.

boreal forest The predominant vegetation of boreal forest is conifer trees, primarily species of spruce (*Picea* spp.) and fir (*Abies* spp.). Lynx and snowshoe hares are strongly associated with this forest type. At the landscape scale, natural and human-caused disturbance processes (e.g., fire, wind, insect infestations, and forest management) influence the spatial and temporal distribution of lynx populations by affecting the distribution of good habitat for snowshoe hares (USFWS, 2009).

broad potential vegetation type A coarse grouping of habitat types based on broad climatic and site conditions such as temperature and moisture gradients. This is a grouping developed for the USDA Forest Service Northern Region that is applicable to broad-level analysis and monitoring (Milburn, Bollenbacher, Manning, & Bush, 2015). See also **potential vegetation type/potential vegetation group**.

broad-scale assessment A synthesis of current scientific knowledge, including a description of uncertainties and assumptions, to provide an understanding of past and present conditions and future trends and a characterization of the ecological, social, and economic components of an area.

broadcast burn A management treatment where a prescribed fire is allowed to burn over a designated area within well-defined boundaries. A broadcast burn is used for reduction of fuel hazard, as a resource management treatment, or both.

candidate species (1) For a U.S. Fish and Wildlife Service candidate species, this is a species for which the U.S. Fish and Wildlife Service possesses sufficient information on vulnerability and threats to support a proposal to list as endangered or threatened but for which no proposed rule has yet been published by the U.S. Fish and Wildlife Service. (2) For a National Marine Fisheries Service candidate species, this is a species that is (a) the subject of a petition to list and for which the National Marine Fisheries Service has determined that listing may be warranted, pursuant to section 4(b)(3)(A) of the Endangered Species Act (16 U.S.C. 1533(b)(3)(A)), or (b) not the subject of a petition but for which the National Marine Fisheries Service has announced in the Federal Register the initiation of a status review

canopy The forest cover of branches and foliage formed by tree crowns.

canopy base height The lowest height above the ground at which there is a sufficient amount of canopy fuel to propagate fire vertically into the canopy; canopy base height is an effective value that incorporates ladder fuels such as shrubs and understory trees.

canopy closure The proportion of the sky hemisphere obscured by vegetation when viewed from a single point on the ground.

canopy cover The proportion of ground covered by the vertical projection of the outermost perimeter of the natural spread of the tree crowns, usually expressed as a percentage.

canopy fuel The live and dead foliage, live and dead branches, and lichen of trees and tall shrubs that lie above the surface fuels.

capability The potential of an area of land and/or water to produce resources, supply goods and services, and allow resource uses under a specified set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions (climate, slope, landform, soils, and geology), as well as the application of management practices (silviculture systems or protection from fire, insects, and disease).

capacity (of developed recreation sites within the Northern Continental Divide Ecosystem primary conservation area) The number of sites available for overnight use (e.g., the number of sites in a campground; the number of rooms available for lodging (as a commercial rental); or the number of cabins, bunkhouses, or recreation residences managed under a special-use permit). [NCDE]

carbon flux The transfer of carbon from one carbon pool to another.

carbon pool Any natural region or zone or other artificial holding area that contains an accumulation of carbon or carbon-bearing compounds or that has the potential to accumulate such substances. May include live and dead material, soil material, and harvested wood products.

carbon sequestration The direct removal of carbon dioxide from the atmosphere through biological processes such as forest growth.

carbon sink A natural or man-made system that absorbs more carbon than it releases.

carbon stock The amount or quantity contained in the inventory of a carbon pool.

carbon stock change The change in carbon stocks over time, calculated by dividing the difference between successive inventories by the number of years between these inventories for each area (e.g., a national forest). A positive change means carbon is being removed from the atmosphere and sequestered by the forests (i.e., a carbon sink), whereas a negative change means carbon is added to the atmosphere by forest-related emissions (i.e., a carbon source).

cave Any naturally occurring void, cavity, recess, or system of interconnected passages that occurs beneath the surface of the Earth or within a cliff or ledge, whether or not the entrance is naturally formed or manmade. The term includes any natural pit, sinkhole, or other feature that is an extension of the entrance.

cave, significant See **significant cave**.

cave ecosystem All groundwater recharge and discharge areas connected to a cave, both discrete and diffuse, and the intermediary aquifers or flow paths; air flow into and out of the cave;

vegetation, fauna, and aquatic communities in or linked to the cave; and all other cave resources. Cave ecosystems can be sensitive to changes in the temperature or chemical composition of the water or air. Some examples of types of cave ecosystems include karst, pseudokarst, lava tubes, ice caves, river undercuts, and erosional features.

cave resource Any material or substance occurring in caves, including but not limited to biotic, cultural, mineralogic, paleontologic, geologic, and hydrologic resources.

clearcut harvest A tree-cutting method used to regenerate a stand that removes virtually all live trees to initiate a new seedling age class (a synonym is clearcutting). Regeneration may be natural or artificial (through planting). See also **even-aged regeneration harvest**.

clearcut with reserves The application of the clearcut harvest method but without removing all trees. Some trees are retained or reserved for an indefinite period (many decades or an entire rotation), to meet resource objectives, such as providing forest structure or future snag recruitment.

climate change adaptation An adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. This adaption includes initiatives and measures to reduce the vulnerability of natural and human systems to actual or expected climate change effects. Adaptation strategies include the following: building resistance to climate-related stressors, increasing ecosystem resilience by minimizing the severity of climate change impacts, reducing the vulnerability and/or increasing the adaptive capacity of ecosystem elements, and facilitating ecological transitions in response to changing environmental conditions.

climax The final stage of succession in a plant community. A relatively stable condition in which plant species on the site are able to perpetuate themselves indefinitely.

closed canopy structural stage See **stem exclusion structural stage**.

coarse filter A landscape-level concept and ecosystem approach to biodiversity management that focuses on the management of ecosystem processes and broad ranges of habitats. The 2012 planning rule states that plans are to be based on a complementary ecosystem and species-specific approach to provide for the diversity of plant and animal communities in the plan area and the long-term persistence of native species in the plan area. This approach is often referred to as the coarse-filter/fine-filter approach. See also **fine filter**.

coarse woody debris A piece or pieces of larger-sized dead woody material (e.g., dead boles, limbs, and large root masses) on the ground or in streams. Minimum size is generally 3 inches in diameter.

Code of Federal Regulations (CFR) An annual codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal government.

cohort A group of trees developing after a single disturbance, commonly consisting of trees of similar age although it can include a considerable range of tree ages, from seedlings to trees that predate the disturbance.

commercial activity See **commercial use or activity**.

commercial thinning A treatment that selectively removes trees large enough to be sold as products, such as sawlogs, poles, or fence posts, from an overstocked stand. This treatment is usually carried out to improve the health and growth rate of the remaining trees and/or to reduce the fire hazard.

commercial use or activity A use or activity on National Forest System lands (a) for which an entry or participation fee is charged or (b) whose primary purpose is the sale of a good or service. In either case, whether the use or activity is intended to produce a profit is not a consideration (see 36 CFR § 251.51).

condition class Classification of the amount of departure from the natural (historical) fire regime based on key ecosystem components such as species composition, structural stage, stand age, and canopy closure.

connectivity The ecological conditions existing at several spatial and temporal scales that provide landscape linkages that permit the exchange of water flow, sediments, and nutrients; the daily and seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long-distance range shifts of species, such as in response to climate change (36 CFR § 219.19). Connectivity needs vary by species. For example, bull trout are able to move upstream to spawn as long as there is not a barrier to connectivity, such as a dam.

conservation The protection, preservation, management, or restoration of natural environments, ecological communities, and species.

conservation watershed network A collection of watersheds where management emphasizes habitat conservation and restoration to support native fish and other aquatic species. See also appendix E.

consultation See **interagency consultation**.

consumptive water use The act of removing water from an available supply and utilizing it in such a manner that it is not returned to a waterbody.

control With respect to invasive species, e.g., plant, pathogen, vertebrate, or invertebrate species, any activity or action taken to reduce the population, contain, limit the spread, or reduce the effects of an invasive species. Control activities are generally directed at established free-living infestations and may not necessarily be intended to eradicate the targeted infestation in all cases.

cover The elements of the environment used by an animal for hiding. Cover varies on a site-specific basis and depends on the species or the time of year. Cover may include topography as well as a variety of vegetation types (e.g., shrubs, dead trees, and live trees). The amount and quality of cover needed depends on the animal's size, mobility, and reluctance or willingness to venture into relatively open areas.

cover type The vegetation composition of an area, described by the plant species forming the majority of the total composition. See also **forest type**.

critical habitat (for a threatened or endangered species) (1) The specific areas within the geographical area occupied by the species at the time it is listed, in accordance with the provisions of section 4 of the Endangered Species Act (16 U.S.C. 1533), on which are found those physical or biological features (a) essential to the conservation of the species and (b) which

may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act (16 U.S.C. 1533), upon a determination by the Secretary that such areas are essential for the conservation of the species. Endangered Species Act, sec. 3 (5)(A), (16 U.S.C. 1532 (3)(5)(A)). Critical habitat is designated through rulemaking by the Secretary of the Interior or Commerce. Endangered Species Act, sec. 4 (a)(3) and (b)(2) (16 U.S.C. 1533 (a)(3) and (b)(2)).

cross-country skiing A form of skiing in which skiers rely on their own locomotion to move across snow-covered terrain rather than using ski lifts or other forms of assistance. Variants of cross-country skiing are adapted to a range of terrain that spans unimproved, sometimes mountainous terrain to groomed courses that are specifically designed for the sport. Note: Cross-country skiing is also referred to as Nordic skiing.

crown The part of a tree or other woody plant bearing live branches and foliage.

Crown of the Continent ecosystem A multi-jurisdiction, 28,000-square-mile area encompassing the northern Rocky Mountain region along the Continental Divide in Montana, Alberta, and British Columbia. For more information, see the assessment of the Flathead National Forest (USDA, 2014).

cubic foot A unit of measurement represented by a cube with sides one foot in length.

culmination of mean annual increment of growth See **mean annual increment of growth**.

cultural landscape A geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic value (Forest Service Manual 2364.41f).

cultural resource An object or definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, places, or objects and traditional cultural properties. Cultural resources include the entire spectrum of resources for which the Forest Service's heritage program is responsible, from artifacts to cultural landscapes, without regard to eligibility for listing in the National Register of Historic Places (Forest Service Manual 2360.5). Also known as heritage resource.

d.b.h. See **diameter at breast height**.

decision document A record of decision, decision notice, or decision memo (36 CFR § 220.3).

dedicated skid trail A pathway used repeatedly, and only, to move logs or trees from the stump to a landing where they are processed and loaded onto trucks.

deferred trail maintenance The backlog of trails where planned maintenance is not performed on schedule.

demographic connectivity area An area intended to allow female grizzly bear occupancy and potential dispersal beyond the Northern Continental Divide Ecosystem to other recovery areas. [NCDE]

den emergence time period The time period in the spring when a grizzly bear emerges from its den and remains in the vicinity before moving to lower elevations. The den emergence time period occurs at the beginning of the non-denning season. Females with cubs usually emerge later and spend more time (a few days to a few weeks) near the den after emergence than do male bears. [NCDE]

denning season The typical time period, within the Northern Continental Divide Ecosystem, during which most grizzly bears are hibernating in dens. There are no restrictions on motorized use related to grizzly bears during the denning season, which occurs

- west of the Continental Divide: from 1 December through 31 March.
- east of the Continental Divide: from 1 December through 15 April. [NCDE]

density (stand) The number of trees growing in a given area, usually expressed in terms of trees per acre.

designated area An area or feature identified and managed to maintain its unique special character or purpose; some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch. Examples of statutorily designated areas are national heritage areas, national recreation areas, national scenic trails, wild and scenic rivers, wilderness areas, and wilderness study areas; examples of administratively designated areas are experimental forests, research natural areas, scenic byways, botanical areas, and significant caves.

detrimental soil disturbance Relates the intensity of soil disturbance to potential impairment of long term soil productivity. Soil disturbance thresholds whereby soil impairment could occur use variables of compaction, rutting, displacement, severely burned soil, mass movement, and/or loss of organic matter (Forest Service Manual Supplement No. 2550-2014-1).

developed recreation site An area that has been improved or developed for recreation (36 CFR § 261.2). A recreation site on National Forest System lands that has a development scale of 3, 4, or 5:

- Development scale 3 (moderate site modification) is where facilities are about equal in terms of protection of the natural site and user comfort. The contemporary/rustic design of improvements is usually based on use of native materials. Inconspicuous vehicular traffic controls are usually provided. Roads may be hard surfaced and trails formalized, with the primary access over high-standard roads. Development density is about three family units per acre. Interpretive services are informal if offered but generally direct.
- Development scale 4 (heavy site modification) is where some facilities are designed strictly for comfort and the convenience of users and facility design may incorporate synthetic materials. There may be extensive use of artificial surfacing of roads and trails. Vehicular traffic control usually is obvious, with the primary access usually over paved roads. Development density is three to five family units per acre. Plant materials are usually native. Interpretive services, if offered, are often formal or structured.
- Development scale 5 (extensive site modification) is where facilities are mostly designed for the comfort and convenience of users and usually include flush toilets; may include showers, bathhouses, laundry facilities, and electrical hookups. Synthetic materials are

commonly used. Walks may be formal and trails may be surfaced. Access is usually by high-speed highways. The development density is five or more family units per acre. Plant materials may be non-native. Formal interpretive services are usually available. Plant materials may be non-native, and mowed lawns and clipped shrubs are not unusual.

developed recreation site capacity within the Northern Continental Divide Ecosystem primary conservation area For purposes of implementing standard FW-STD-REC-01, developed recreation site capacity on National Forest System lands that are designed and managed for overnight use includes

- the number of campsites available in a campground,
- the number of rooms available for lodging at a ski area or guest lodge,
- the maximum sleeping capacity of a cabin rental or bunkhouse that is available for overnight use by the public, and
- the maximum parking capacity at picnic areas, trailheads, or boat launches that are not closed to overnight use. [NCDE]

developed recreation site within the Northern Continental Divide Ecosystem primary conservation area For purposes of implementing standard FW-STD-REC-01, developed recreation sites on National Forest System lands that are designed and managed for overnight use include campgrounds, lodging at ski areas, cabin rentals, huts, guest lodges, and recreation residences. This standard does not apply to dispersed recreation sites nor to developed recreation sites managed for day-use only (e.g., outfitter camps, roadside trail crossings or interpretive pull-outs; trailheads, picnic areas, or boat launches that are closed at night; and ski areas that do not have overnight lodging). [NCDE]

diameter at breast height (d.b.h.) The diameter of a tree measured 4.5 feet above the ground on the uphill side of the tree, or the diameter of a log measured 4.5 feet from the large end of the log.

dispersed recreation An area in a national forest or national grassland with limited or no amenities provided for recreational users (36 CFR § 261.2).

dispersed recreation site A recreation site on National Forest System lands that has a development scale of 0 to 2:

- Development scale 0 (no site modification) has no constructed features evident at the site.
- Development scale 1 (almost no site modification) has rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. The use of synthetic materials is excluded. The primary access is usually over primitive roads. The spacing is informal and is extended to minimize contacts between users.
- Development scale 2 (minimal site modification) has rustic or rudimentary improvements designed primarily for protection of the site rather than the comfort of the users. The use of synthetic materials is avoided. The spacing is informal and is extended to minimize contacts between users. Primary access usually over primitive roads. Any interpretive services are informal, almost subliminal.

disturbance An event that alters the structure, composition, or function of terrestrial or aquatic habitats; any relatively discrete event in time that disrupts ecosystem, watershed, community, or species population structure and/or function and changes resources, substrate availability, or the

physical environment. Natural disturbances include, among others, drought, floods, wind, fires, wildlife grazing, and insects and pathogens; human-caused disturbances include actions such as timber harvest, livestock grazing, roads, and the introduction of exotic species.

disturbance regime A description of the characteristic types of disturbance on a given landscape; the frequency, severity, size, and distribution of these characteristic disturbance types and their interactions. The natural pattern of periodic disturbances, such as fire or flooding.

disturbance or displacement The repeated avoidance of humans by a species by the species shifting its habitat use in space or time.

dominance type The category of terrestrial plant community representing the most common plant species (such as a tree species) or plant community type (such as grassland or shrubland) that occupies the site. The dominant species or plant community comprises at least 40 percent of the total species or community abundance, as measured by different methods depending on data source and plant community type (e.g., canopy cover, basal area, trees per acre). See also **cover type** and **forest type**.

driver (ecology) See **ecosystem driver**.

duff A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

dysgenic Biologically defective or deficient; exerting a detrimental effect on later generations through the inheritance of undesirable characteristics.

early-successional stage/seral stage (forest) The earliest stage in the sequence of plant communities that develop after a stand-replacing disturbance such as fire or regeneration harvest. On the forested communities of the Flathead National Forest, this stage typically occurs in the period from 1 to 30 or 40 years after the disturbance and is dominated by grass, forbs, shrubs, and seedling/sapling-sized trees.

ecological and social characteristics Qualities of recommended wilderness areas that provide the basis for suitability for inclusion in the National Wilderness Preservation System; identified for each recommended wilderness area (see appendix 4). Often, the ecological characteristics are discussed in terms of *natural quality* and *undeveloped* and can be represented by landscapes where the evidence of human disturbance is not readily apparent or the intactness of an ecosystem. Social characteristics may be discussed in terms of *solitude* or *unconfined* or *primitive recreation* and are often represented by remote, quiet landscapes where recreation activities such as hiking, climbing, fishing, and hunting are predominant. Both ecological and social characteristics can have *other features of value*, such as a cave system (ecological) or cultural resources (social).

ecological condition Aspects of the biological and physical environment that can affect the diversity of plant and animal communities, the persistence of native species, and the productive capacity of ecological systems; ecological conditions include habitat and other influences on species and the environment. Examples of ecological conditions include the abundance and distribution of aquatic and terrestrial habitats, connectivity, roads and other structural developments, human uses, and invasive species.

ecological integrity The quality or condition of an ecosystem whose dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and that can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence. Also refers to the quality of a natural unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species, and ecosystem diversity ensured for the future.

ecological sustainability See **sustainability**.

ecosystem A spatially explicit, relatively homogeneous unit of the Earth that includes all interacting organisms and elements of the abiotic environment within its boundaries. An ecosystem is commonly described in terms of its

- **composition** The biological elements within the different levels of biological organization, from genes and species to communities and ecosystems.
- **structure** The organization and physical arrangement of biological elements such as snags and down woody debris, vertical and horizontal distribution of vegetation, stream habitat complexity, landscape pattern, and connectivity.
- **function** Ecological processes that sustain composition and structure such as energy flow, nutrient cycling and retention, soil development and retention, predation and herbivory, and natural disturbances such as wind, fire, and floods. (36 CFR § 219.19)

ecosystem driver A natural or human-induced factor that directly or indirectly causes a change in an ecosystem. Examples include climate change, fire events, invasive species, and flooding.

ecosystem resilience See **resilience**.

ecosystem service The benefit(s) people obtain from an ecosystem, including (1) provisioning services, such as clean air and fresh water, energy, fuel, forage, fiber, and minerals; (2) regulating services, such as long-term storage of carbon; climate regulation; water filtration, purification, and storage; soil stabilization; flood control; and disease regulation; (3) supporting services, such as pollination, seed dispersal, soil formation, and nutrient cycling; and (4) cultural services, such as educational, aesthetic, spiritual and cultural heritage values, recreational experiences, and tourism opportunities.

ecosystem stressor A factor that may directly or indirectly degrade or impair ecosystem composition, structure, or ecological process in a manner that may impair its ecological integrity, such as an invasive species, loss of connectivity, or the disruption of a natural disturbance regime.

electric bikes (e-bikes) Bicycles equipped with a motor, battery, and a controller to operate specific options such as “pedal with power assistance” or the use of a throttle to “twist and go” automatically. E-bikes are motor vehicles and are subject to regulation under the travel management rule, which requires designation of National Forest System roads and trails and areas on National Forest System lands for motor vehicle use (36 § CFR 212.51(a)).

elk security habitat An area at least 0.5 mile from a road open to public motorized use that provides a mosaic of cover and forage. Elk security habitat is evaluated at a scale that is informed by interagency recommendations (if available) and is based on knowledge of the specific area and on the best available scientific information.

emergency situation A circumstance on National Forest System lands for which immediate implementation of all or part of a decision is necessary for relief from hazards threatening human health and safety or natural resources on those National Forest System or adjacent lands or that would result in substantial loss of economic value to the Federal government if implementation of the decision were delayed (must meet the requirements of 36 § CFR 218.21). [NCDE]

employment Labor input into a production process, measured in the number of person-years or jobs. A person-year is 2,000 working hours performed, for example, by one person working yearlong or by several persons working seasonally.

endangered species A species that the Secretary of the Interior or the Secretary of Commerce has determined is in danger of extinction throughout all or a significant portion of its range. Endangered species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act. Endangered species are listed at 50 CFR §§ 17.11, 17.12, and 224.101.

environmental document A written analysis that provides sufficient information for a responsible official to undertake an environmental review. Examples include a categorical exclusion, an environmental assessment, and an environmental impact statement.

epidemic (outbreak) The rapid spread, growth, and development of pathogen or insect populations that affect large numbers of a host population throughout an area at the same time.

even-aged regeneration harvest A cutting method that removes most of the existing trees to create conditions suitable for initiation of a seedling age class. The seedlings may be established through natural or artificial (planting) means. The term even-aged regeneration harvest as used in this plan does not apply to the harvest of trees killed by a stand-replacing natural disturbance (e.g., high-severity fire, insect epidemic). See also **salvage harvest**.

even-aged stand A stand of trees composed of a single age class (cohort). Usually trees in a single age class are within 20 years of each other.

exotic species A plant or animal species in an area where they do not occur naturally; a non-native species.

expanded grizzly bear distribution zone That portion of the Helena National Forest outside of the Northern Continental Divide Ecosystem where grizzly bears are considered to be present, as defined in the 2013 biological assessment for grizzly bears on the west side of the Helena National Forest (Pengerth, 2013). [NCDE]

Federal Register (FR) The Federal Register is the official gazette of the United States government. It provides legal notice of administrative rules and notices and presidential documents in a comprehensive, uniform manner.

fine filter A component of the multi-level approach to biological conservation (i.e., coarse filter/fine filter), where the focus is on individual species (i.e., plant, animal) across a plan area. See also **coarse filter**.

fine fuel Fast-drying dead or live materials, generally characterized by a comparatively high surface-area-to-volume ratio, which is defined as less than 0.25 inches in diameter and having a time lag of 1 hour or less. Fine fuels (grass, leaves, needles, etc.) ignite readily and are consumed rapidly by fire when dry (NWCG, 2017).

fire control See **fire suppression**.

fire exclusion The disruption of a characteristic pattern of fire intensity and occurrence, primarily through fire suppression.

fire hazard The potential fire behavior for a fuel type, regardless of the fuel type's weather-influenced fuel moisture content or its resistance to fireline construction. Fire behavior assessment is based on physical fuel characteristics such as fuel arrangement, fuel load, condition of herbaceous vegetation, and presence of elevated fuels.

fire regime The role of fire in ecosystems and its interactions with dominant vegetation. The periodicity and pattern of naturally occurring fires in a particular area or vegetative type, described in terms of frequency, intensity (heat energy released), severity (ecological effect), seasonal timing, and aerial extent (Anderson, 1982). The five natural fire regimes on the Flathead National Forest are as follows:

- **I** 0 to 35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced);
- **II** 0 to 35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- **III** 35 to 100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced);
- **IV** 35 to 100+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- **V** 200+ year frequency and high (stand replacement) severity.

fire risk The probability or chance of fire starting determined by the presence and activities of causative agents.

fire severity The ecological effect of the fire; refers to the effect of the fire on the dominant overstory vegetation, which is coniferous trees on the Flathead National Forest. Three levels of fire severity are recognized:

- **High severity** Greater than 75 percent of the dominant overstory vegetation are killed. Also referred to as stand-replacement or stand-replacing fire.
- **Moderate severity** 35 to 75 percent of the dominant overstory vegetation are killed.
- **Low severity** Less than 35 percent of the dominant overstory vegetation are killed

In addition, **mixed-severity fire** refers to a fire event or an area where a broad mix of low, moderate, and high fire severity burn conditions occur.

fire suppression The work and activities connected with fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.

fire-adapted ecosystem An ecosystem in which the organisms (i.e., the plants and animals) are adapted to fire as it functions under the natural fire regime. These ecosystems are resilient to fire and dependent on the resulting ecological effects of fire to sustain the natural diversity of vegetation conditions and animal species.

fire-adapted species A plant type that has evolutionary adaptations to survive and thrive in an ecosystem where fire is a primary driver, including tree species that are identified as fire tolerant as well as trees and other plant species that have a myriad of other types of adaptations. Some examples of adaptations are the serotinous cones of lodgepole pine (which open only when heated in a fire); fast early tree growth for rapid site domination; rhizomatous (below ground) root systems or root crowns; seeds with hard, fire-resistant seed coats; or very lightweight, wind-dispersed seeds (see also **fire-tolerant tree species**).

fire-intolerant tree species A tree type that is susceptible to severe damage or mortality in a fire event. Characteristics typically include thin bark at maturity, crowns that retain lower branches (close to the ground), and less protected buds and needles. For example, subalpine fir, grand fir, and spruce are fire-intolerant species on the Flathead National Forest.

fire-tolerant tree species A tree type resistant to severe damage or mortality in a fire event. Characteristics include thick bark at maturity, readily self-pruning (i.e., lower branches are shed as the tree grows), and protected buds. Examples of fire-tolerant species on the Flathead National Forest are western larch, ponderosa pine and, to a lesser extent, Douglas-fir.

fish passage A structure that provides clear access for migrating fish through a potential barrier.

flame length The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity (NWCG, 2017).

Flathead River Basin The watershed consisting of all three forks of the Flathead River in Montana

focal species A small subset of species whose status permits inferences related to the integrity of the larger ecological system to which it belongs and provides meaningful information regarding the effectiveness of a land management plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area. Focal species are commonly selected on the basis of their functional role in ecosystems (36 § CFR 219.19).

food/wildlife attractant storage special order A legal notice regarding the use and storage of wildlife attractants on National Forest System lands designed to reduce wildlife-human conflict.

forage The browse and non-woody plants available to livestock or wildlife for feed.

forage allowance See **animal unit month**.

forb An herbaceous (herb-like) plant other than grass or grass-like plants.

forest connectivity An area for wildlife species that prefer to remain within or close to forested cover.

forest dominance type A classification that reflects the most common tree species within a forest stand. The dominant species comprises at least 40 percent of the stocking, as measured by canopy cover, basal area, or trees per acre, depending on available information and stand characteristics. See also **dominance type**.

forest health The perceived condition of a forest derived from factors such as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance. A useful way to communicate about the current condition of the forest, especially

with regard to the ability of the ecosystem to respond to disturbances. Note: Perceptions and interpretations of forest health are influenced by individual and cultural viewpoints, land management objectives, spatial and temporal scales, the relative health of the stands that comprise the forest, and the appearance of the forest at a point in time.

forest highway A forest road under the jurisdiction of, and maintained by, a public authority and open to public travel (U.S.C. Title 23, Section 101(a)), designated by an agreement with the Forest Service, State transportation agency, and the Federal Highway Administration.

forest land An area that is at least 10 percent occupied by forest trees of any size, or that formerly had such tree cover, and is not currently developed for non-forest uses. Lands developed for non-forest use include areas for crops, improved pasture, residential or administrative sites, improved roads of any width and adjoining road clearings, and power line clearings of any width.

forest management The practical application of biological, physical, quantitative, managerial, economic, social, and policy principles to the regeneration, management, utilization, and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest. Note: Forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products, and other forest resource values. Forest management varies in intensity from leaving the forest alone to a highly intensive regime composed of periodic silvicultural treatments.

forest plan A document that guides sustainable, integrated resource management of the resources within a plan area and within the context of the broader landscape, giving due consideration to the relative values of the various resources in particular areas (36 § CFR 219.1(b)). Consistent with the Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. 528–531), the Forest Service manages National Forest System lands to sustain the multiple use of its renewable resources in perpetuity while maintaining the long-term health and productivity of the land. Resources are managed through a combination of approaches and concepts for the benefit of human communities and natural resources.

Forest Service Handbook The principal source of specialized guidance and instruction for carrying out the direction issued in the Forest Service Manual. Specialists and technicians are the primary audience of handbook direction. Handbooks may also incorporate external directives with related U.S. Department of Agriculture and Forest Service directive supplements.

Forest Service Manual Contains legal authorities, objectives, policies, responsibilities, instructions, and guidance needed on a continuing basis by Forest Service line officers and primary staff in more than one unit to plan and execute assigned programs and activities.

forest size class A classification of the predominant diameter class of live trees within a setting. As used for the vegetation analysis and direction associated with this forest plan, it is a classification of the mean diameter at breast height calculated as either quadratic mean diameter or basal area-weighted average diameter. Quadratic mean diameter is the diameter of a tree with the average basal area. Basal area-weighted average diameter is the average diameter of the live trees weighted by their basal area. Basal area weighted average diameter is less influenced by small trees than quadratic mean diameter. Although the quadratic mean diameter is larger than the arithmetic mean diameter of a stand, it is less than the basal area-weighted average diameter.

forest structure A complex three-dimensional construct consisting of the various horizontal and vertical physical elements of the forest, including tree diameters, tree heights, tree ages, stand

density, canopy layers, quantity and quality of deadwood, herbaceous species, and the clumpiness of the stand. There is no one measure to quantify or describe structure. Often individual forest attributes are described and integrated to evaluate forest structure, such as tree sizes or ages or number of canopy layers.

forest system road See **road—National Forest System**.

forest type A category of forest usually defined by its vegetation, particularly its dominant vegetation, as based on percentage cover of trees, e.g., subalpine fir/spruce; lodgepole pine. See also **cover type** and **dominance type**.

fuel management An act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire, in support of land management objectives (NWCG, 2017).

fuel model A set of surface plant material characteristics (e.g., load and surface-area-to-volume-ratio by size class, heat content, and depth) organized for input to a fire model. Standard fuel models such as Anderson's (1982) have been stylized to represent specific fuel conditions.

fuel reduction The manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

fuel treatment The manipulation or removal of dead or live plant materials to reduce the likelihood of ignition, fire intensity, or rate of spread and/or designed to lessen potential damage/mortality of trees and resistance to fire control. Example treatments include lopping, chipping, crushing, understory tree removal, thinning, piling, and prescribed burning. May or may not provide commercial forest products (NWCG, 2017).

fuels reduction zone An area in which continuous high-hazard fuels are broken up. These zones are designed to increase firefighter safety and reduce resistance to fire control efforts. Fuels reduction zones may be of any size or shape. They may have a higher number of snags, down logs, and canopy closure than other fuels treatment zones. They are recognized as being a significant portion of a complete fuels management program.

fuelwood Wood that is used for conversion to a form of energy (e.g., firewood, biomass).

gateway community A group of people residing within, or intersecting, a 60-mile radius around a specific boundary or access point, such as an entrance to a national park.

geographic area A spatially contiguous land area identified within the planning area. A geographic area may overlap with a management area (36 CFR § 219.19).

geographic information system (GIS) A computer process that links database software to graphics (spatially explicit) software and provides database and analytic capabilities.

gradient (stream) The slope of a streambed.

grazing allotment A designated area of land that is available for livestock grazing and is represented on a map. A grazing allotment can include National Forest System and non-National Forest System lands. Permits are issued for the use of allotments or portions of allotments. Allotments may be

- **active** Livestock grazing allotments that are in use, including pack and saddle stock allotments.
- **closed** Areas having suitable livestock range that have been closed to livestock grazing by administrative decision or action.
- **combined** An allotment that has been combined into another allotment and therefore no longer exists as an independent allotment.
- **vacant** An allotment that does not have a current grazing permit issued. (Forest Service Manual 2205).

grazing permit in inactive status A grazing permit for which all permitted uses have expired, been cancelled, or been waived.

grazing permit in non-use status A grazing permit that is not being used. Non-use of a term grazing permit, in whole or in part, must be approved by a Forest supervisor and is allowed for permittee convenience, resource protection or development, or range research (Forest Service Manual 2231.7).

greenhouse gas Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the greenhouse effect. Water vapor, carbon dioxide, nitrous oxide, methane, and ozone are the primary greenhouse gases in the Earth's atmosphere.

greenline vegetation The concept of the "greenline" as a location to sample and monitor streamside vegetation was presented by Winward (2000), who described it as "the first perennial vegetation . . . on or near the water's edge." The greenline is a useful location for measuring vegetation along streams because it is the dynamic interface of the stream and terrestrial ecosystems.

Grizzly Bear Conservation Strategy A document published by the U.S. Fish and Wildlife Service that describes the regulatory framework for management of the Northern Continental Divide Ecosystem grizzly bear population and its habitat upon recovery and subsequent removal from the Federal list of threatened and endangered species. Strategies have also been prepared for other ecosystems.

grizzly bear-human conflict An interaction between a grizzly bear and a human in which bears either do, or attempt to, injure people, damage property, kill or injure livestock, damage beehives, or obtain anthropogenic foods or attractants or agricultural crops. [NCDE]

groundcover The material that is located on the soil surface and includes understory vegetation, forest litter, and woody material

ground fire Organic material such as duff, organic soils, roots, and rotten buried logs burning beneath the surface (NWCG, 2017).

ground-based logging system A log-skidding method using tracked or wheeled tractors. These tractors or "skidders" typically operate on gentle slopes (< 40 percent). Steeper slopes may require cable logging systems.

groundwater-dependent ecosystem A community of plants, animals, and other organisms whose extent and life processes depend on groundwater. Examples include many wetlands, groundwater-fed lakes and streams, cave and karst systems, aquifer systems, springs, and seeps.

group selection harvest A tree-cutting method designed to create and maintain an uneven-aged stand by the removal of small patches of trees (generally less than one acre in size) at periodic intervals to meet a predetermined goal of size distribution and species composition within the stand. See also **uneven-aged harvest** and **selection harvest**.

group use An activity conducted on National Forest System lands that involves a group of 75 or more people, either as participants or spectators (36 CFR § 251.51).

guide To provide services or assistance (such as supervision, protection, education, training, packing, touring, subsistence, transporting people, or interpretation) for pecuniary remuneration or other gain to individuals or groups on National Forest System lands (36 CFR § 251.51).

habitat connectivity See **connectivity**.

habitat security See **security habitat**.

habitat type An aggregation of plant communities of similar biophysical characteristics, and similar function and response to disturbances. A habitat type will produce similar plant communities at climax. On the Flathead National Forest, habitat types are based upon Pfister et al. (1977). See also **potential vegetation type/potential vegetation group**.

harvested wood products (HWP) As used in the context of carbon pools, includes all wood material (including bark) that leaves harvest sites. Slash and other material left at harvest sites is regarded as on-site dead organic matter for the purpose of analysis of carbon pools.

hazard tree A tree that has the potential to cause property damage, personal injury, or fatality in the event of a failure, where failure is the mechanical breakage of a tree or tree part. Failures often result from the interaction of defects, weather factors, ice or snow loading, or exposure to wind. Tree hazards may include dead or dying trees, dead parts of live trees, or unstable live trees (due to structural defects or other factors) that are within striking distance of people or property (a target). Defects are flaws in a tree that reduce its structural strength. Trees may have single or multiple defects that may or may not be detectable. Failures result in accidents only if they strike a target.

health In the context of forest management, health is a description of the general condition of the forest or individual tree. Good health is the state of being free from insect, disease, injuries, or other factors that would adversely impact the functional capabilities of the forest or tree.

Healthy Forests Restoration Act The public law (108-148), passed in December 2003 that provides statutory processes for hazardous fuel reduction projects on certain types of at-risk public lands managed by the National Forest System or the Bureau of Land Management. The Healthy Forests Restoration Act also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships.

heritage resource See **cultural resource**.

hibernaculum (plural: hibernacula) A shelter occupied in the winter by a dormant animal, such as a bat, insect, or marmot.

highway All roads that are part of the National Highway System (23 CFR 470.107(b)).

historic property Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the National Register criteria (Forest Service Manual 2360.5).

historical range of variation The variation in ecological conditions resulting from disturbance regimes and other natural influences under which the ecosystem and forests evolved. Typically refers to the period prior to the dramatic changes in human land uses and patterns beginning with the influx of European Americans in about the mid-1800s. Historical range of variation is considered valuable for providing a context or frame of reference to evaluate current ecosystem conditions and understanding what an ecologically healthy and sustainable condition might look like. See also **natural range of variation**.

home range The area to which an individual animal restricts most of its usual activities. Intruders may or may not be excluded from the area.

hydrologic unit code A sequence of numbers or letters that identify a hydrological feature such as a river, river reach, lake, or drainage basin (also called watershed).

hydrologically stable road A road that has been essentially stormproofed through a series of proactive steps and activities so that further maintenance will not be needed and significant erosion will not occur.

improvement of recreation sites Can include but is not limited to installation or repair of toilets, replacement and/or installation of picnic tables and fire rings, alignment of parking spaces, planting of vegetation, installation or replacement of bulletin boards, and installation of food storage boxes.

incidental take The “take” of listed fish and wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a Federal agency or applicant (50 CFR 402.02). The following terms are defined by the USFWS:

- **take** To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a species listed as endangered or threatened, or to attempt to engage in any such conduct;
- **harm** Significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering; and
- **harass** An intentional or negligent act or omission that creates the likelihood of injury to listed wildlife by annoying to such an extent as to significantly disrupt behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.

incidental take statement A statement issued as part of a biological opinion that specifies, among other requirements, the anticipated amount of “incidental take” on listed threatened and/or endangered fish and wildlife species; reasonable and prudent measures considered necessary or appropriate to minimize the impact of such take; and terms and conditions (including reporting requirements) that implement the specified measures.

infestation A large number of organisms (e.g., insects, invasive species) that cause substantial impacts (generally considered negative) to an area or resource.

inherent capability of the plan area The ecological capacity or ecological potential of an area characterized by the interrelationship of its physical elements, its climatic regime, and natural disturbances.

initial attack A planned response to a wildfire given the wildfire's potential fire behavior. The objective of initial attack is to stop the fire and put it out in a manner consistent with firefighter and public safety and values to be protected.

integrated pest management A pest (in this context, an invasive species) control strategy based on the determination of an economic, human health, or environmental threshold that indicates when a pest population is approaching the level at which control measures are necessary to prevent a decline in the desired conditions (economic or environmental factors). In principle, integrated pest management is an ecologically based holistic strategy that relies on natural mortality factors such as natural enemies, weather, and environmental management and seeks control tactics that disrupt these factors as little as possible. Integrated pest management techniques are defined within four broad categories: (1) biological, (2) cultural, (3) mechanical/physical, and (4) chemical (Forest Service Manual 2900).

integrated resource management A means to realize many benefits from a forest or other natural area and ensure that the renewable benefits are there for future generations (NWCG, 2017).

integrity (ecology) See **ecological integrity**.

interagency consultation A process required by section 7 of the Endangered Species Act whereby Federal agencies proposing activities that may affect a listed species or critical habitat confer with the U.S. Fish and Wildlife Service about the impacts of the activity on the species (50 CFR 402).

interdisciplinary team A group of Forest Service land use and resource specialists who are responsible for developing the forest plan and environmental impact statement and for making recommendations to the responsible official.

intermediate harvest A removal of trees from a stand between the time of its formation and a regeneration harvest. Most commonly applied intermediate cuttings are release, thinning, and improvement cuts. A forested stand remains following harvest, though tree density will vary depending on management objectives for the site.

intermittent stream A stream that flows only at certain times of the year when it receives water, usually from springs or a surface source such as melting snow.

invasive species An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species infest both aquatic and terrestrial areas and can be identified within any of the following four taxonomic categories: plants, vertebrates, invertebrates, and pathogens (Executive Order 13112). All State- and county-listed noxious weeds are considered invasive plants. In addition, other exotic species that are not listed but can successfully outcompete native plants and displace native plant communities are termed invasive species.

inventoried roadless areas Forest Service lands that have been identified by government review as lands without existing roads that could be suitable for roadless area conservation as wilderness or other non-standard protections.

jeopardy Under the Endangered Species Act, jeopardy occurs when an action is reasonably expected, directly or indirectly, to diminish a species' numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced.

karst Terrain created by the chemical solution of the bedrock, including carbonate rocks, gypsum, and to a minor extent other rocks, and characterized by disrupted surface drainage, abundant enclosed depressions, and a well-developed system of underground drainage systems, which may include caves. The term "pseudokarst" is sometimes used to distinguish karst terrain formed on non-carbonate bedrock.

karst resources The elements of a karst landscape, commonly characterized by losing streams (streams that lose water as they flow downstream), sinkholes, collapse features, caves, or springs. These may be physical features but may also relate to karst groundwater systems, system(s) function, and biological significance to the vegetative, wildlife, and aquatic communities.

key ecosystem characteristic The dominant ecological characteristic(s) that describes the composition, structure, function, and connectivity of terrestrial, aquatic, and riparian ecosystems that are relevant to addressing important concerns about a land management plan. Key ecosystem characteristics are important to establishing or evaluating plan components that would support ecological conditions to maintain or restore the ecological integrity of ecosystems in the plan area.

krummholz vegetation A type of stunted, deformed vegetation encountered in subarctic and subalpine tree line landscapes, shaped by continual exposure to fierce, freezing winds.

labor income All compensation that is a return to work effort. This includes labor earnings, employer-provided benefits, taxes paid to government on behalf of employees, and the labor portion of entrepreneurial income.

ladder fuel Plant materials that provide vertical continuity between forest strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease.

land management plan See **forest plan**.

landscape A defined area irrespective of ownership or other artificial boundaries, such as a spatial mosaic of terrestrial and aquatic ecosystems, landforms, and plant communities, repeated in similar form throughout such a defined area (36 CFR § 219.19).

landtype A unit shown on an inventory map with relatively uniform potential for a defined set of land uses. Properties of soils, landform, natural vegetation, and bedrock are commonly components of landtype delineation used to evaluate potentials and limitations for land use.

late-successional stage/seral stage (forest) A late stage in the sequence of plant communities that develops after a disturbance such as fire or harvest. On the forested communities of the Flathead National Forest, this stage may begin to develop 140 years or more after the disturbance. Forest structures can be very diverse, with a wide range in densities, number of canopy layers, and tree sizes. Usually, larger trees are dominant (> 16 inches diameter at breast height).

linkage (also linkage habitat, linkage area, or linkage zone) An area that will support a low-density population of a species during certain parts of the year and that facilitates demographic and/or genetic connectivity between geographically separate patches of habitat suitable for that species. Linkage areas facilitate movements of an animal (e.g., dispersal, breeding season movements, exploratory movements) beyond its home range. Linkage areas may include sizeable areas of non-habitat and areas influenced by human actions.

livestock A type of domestic animal raised for commercial production purposes, e.g., cattle. Small livestock refers to animals smaller than a cow, such as sheep, goats, and llamas.

lynx critical habitat An area designated by the USFWS that provides the physical or biological features essential to the conservation of the Canada lynx (50 CFR Part 402 Federal Register / Vol. 81, No. 28 / Thursday, February 11, 2016 / Rules and Regulations), as described in 50 CFR Part 17 Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx and Revised Distinct Population Segment Boundary; Final Rule (USFWS, 2014).

maintain (ecological context) To keep in existence or continuance of the desired ecological condition in terms of its desired composition, structure, and processes. Depending upon the circumstances, ecological conditions may be maintained by active or passive management or both. Maintain does not mean to keep the status quo.

maintain (social context) To keep in existence or continuance of the desired recreation opportunities and settings that reflect the physical, managerial, and social settings of the desired recreation opportunity spectrum class. In recommended wilderness areas, facilities, trails, and visitor use should be managed to preserve and protect wilderness characteristics. Maintain does not mean to keep the status quo.

managed watershed See **reference vs. managed watershed**.

management area A land area identified within a planning area that has the same set of applicable plan components. A management area does not have to be spatially contiguous (36 CFR § 219.19). The Flathead National Forest plan has seven designated management area categories (numbered 1 through 7) across the Forest. Most are further divided into subcategories (indicated by a through d, as appropriate).

Management areas on the Flathead National Forest

1a Designated wilderness
1b Recommended wilderness
2a Designated wild and scenic rivers
2b Eligible wild and scenic rivers
3a Administrative areas
3b Special areas
4a Research
4b Experimental and demonstration forests natural area
5a Backcountry nonmotorized year-round
5b Backcountry motorized year-round, wheeled vehicle use only on designated roads, trails, and areas
5c Backcountry motorized over-snow vehicle opportunities (on designated routes and areas)

5d Backcountry wheeled vehicle use on designated roads, trails, and areas April 1 to Nov. 30
6a General forest low-intensity vegetation management
6b General forest medium-intensity vegetation management
6c General forest high-intensity vegetation management
7 Focused recreation areas

management system (timber) An administrative method that includes even-aged stand and uneven-aged stand protocols.

mass wasting The geomorphic process by which soil, sand, regolith, and rock move downslope, typically as a mass, largely under the force of gravity.

mature tree A tree that has achieved its maximum or near-maximum mean annual rate of growth in height or diameter.

mbf and mmbf (thousand board feet and million board feet, respectively) A specialized unit of measure for the volume of lumber in the United States and Canada. One board foot is the volume of a 1-foot length of board 1 foot wide and 1 inch thick.

mcf and mmcf (thousand cubic feet and million cubic feet, respectively) A unit of measure for the volume of forest products; one cubic foot is represented by a cube with sides one foot in length.

mean annual increment of growth The total increment of increase in volume of a stand (standing crop plus thinning removals) up to a given age divided by that age. Culmination of mean annual increment of growth is the age in the growth cycle of an even-aged stand in which the average annual rate of increase of volume is at a maximum. In land management plans, mean annual increment is expressed in cubic measure and is based on the expected growth of stands, according to intensities and utilization guidelines in the plan.

mechanized transport (mechanical transport) Travel using a contrivance for moving people or material in or over land, water, or air, having moving parts, that provides a mechanical advantage to the user, and that is powered by a living or nonliving power source. This includes, but is not limited to, sailboats, hang gliders, parachutes, bicycles, game carriers, carts, and wagons. It does not include wheelchairs when used as necessary medical appliances. It also does not include skis, snowshoes, rafts, canoes, sleds, travois, or similar primitive devices without moving parts (Forest Service Manual 2320.5(3)).

mesic A type of habitat that is moderately moist.

metropolitan area An urban area that has a population of more than 50,000.

micropolitan area An urban area that has a population of 10,000 to 49,999.

mid-successional stage/mid-seral stage (forest) A mid stage in the sequence of plant communities that develop after a disturbance such as fire or harvest. On the forested communities of the Flathead National Forest, stands may be considered in this stage from about 40 to 140 years after the disturbance. Stand structure, such as density and number of canopy layers, can vary widely. Dominant tree sizes are typically from 5 to 15 inches diameter at breast height.

mine reclamation The process of restoring land that has been mined to a natural or economically usable state. Although the process of mine reclamation occurs once mining is completed, the preparation and planning of mine reclamation activities occur prior to a mine being permitted or started.

minerals The Forest Service defines three types of mineral (and energy) resources:

- Locatable minerals: Commodities such as gold, silver, copper, zinc, nickel, lead, platinum, etc., and some nonmetallic minerals such as asbestos, gypsum, and gemstones.
- Salable minerals: Common varieties of sand, stone, gravel, cinders, clay, pumice, and pumicite.
- Leasable minerals: Commodities such as oil, gas, coal, geothermal resources, and deposits of potassium, sodium phosphates, oil shale, sulfur, and solid minerals on lands acquired through the Mineral Lands Leasing Act of 1920, as amended; the Geothermal Steam Act of 1970, as amended; or the Acquired Lands Act of 1947, as amended.

minimum impact suppression tactics The application of strategy and tactics that effectively meet wildland fire suppression and resource objectives with the least environmental, cultural, and social impacts.

mitigate To avoid, minimize, rectify, reduce, or compensate for the adverse environmental impacts associated with an action.

monitoring A systematic process of collecting information to evaluate effects of actions or changes in conditions or relationships.

motorized equipment A machine that uses a motor, engine, or other nonliving power source. This includes but is not limited to such machines as chainsaws, aircraft, snowmobiles, generators, motorboats, and motor vehicles. It does not include small battery- or gas-powered hand-carried devices such as shavers, wristwatches, flashlights, cameras, stoves, or other similar small equipment.

motorized over-snow vehicle use An activity involving a motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis while in use over snow (36 CFR § 212.1, Definitions).

motorized route A National Forest System road or trail that is designated for motorized use on a motor vehicle use map pursuant to 36 CFR § 212.51.

motorized travel Includes both wheeled and over-snow vehicles.

motorized use The designation of roads, trails, and areas that are open to motor vehicle use on National Forest System lands as specified in Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005 and in 36 CFR §§ 212, 251, 261, Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule.

moving window analysis A geographic information system procedure that quantifies the density of roads and trails by incrementally moving a template across a digital map. [NCDE]

multiple use The management of the various renewable surface resources of the National Forest System lands so that they are utilized in the combination that will best meet the needs of the American people, making the most judicious use of the land for some or all of these resources or

related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions. Some lands will be used for less than all of the resources. Multiple-use management is characterized by harmonious and coordinated management of the various resources without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output, consistent with the Multiple-Use Sustained-Yield Act of 1960 (see 16 U.S.C. 528–531).

National Forest System The lands reserved or withdrawn from the public domain of the United States as national forests; all lands acquired for national forests through purchase, exchange, donation, or other means; the national grasslands and land utilization projects administered under title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 U.S.C. 1010-1012); and other lands, waters, or interests therein that are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system.

National Register of Historic Places The official list of the Nation's historic places worthy of preservation. On the Forest, five historic properties are currently listed in the National Register of Historic Places: Hornet Lookout, Flathead National Forest Backcountry Administrative Facilities Historic District, the South Fork Phone Line, the Wurtz Homestead, and Big Creek Ranger Station Historic District.

native knowledge A way of knowing or understanding the world, including traditional ecological and social knowledge of the environment derived from multiple generations of indigenous peoples' interactions, observations, and experiences with their ecological systems. Native knowledge is place-based and culture-based knowledge through which people learn to live in and adapt to their own environment through interactions, observations, and experiences with their ecological system. This knowledge is generally not solely gained, developed by, or retained by individuals but is rather accumulated over successive generations and is expressed through oral traditions, ceremonies, stories, dances, songs, art, and other means within a particular cultural context.

native species An organism that was historically or is presently in a particular ecosystem as a result of natural migratory or evolutionary processes, not as a result of an accidental or deliberate introduction into that ecosystem. An organism's presence and evolution (adaptation) in an area are determined by climate, soil, and other biotic and abiotic factors.

natural disturbance regime A description of the pattern (e.g., frequency, intensity, area affected, distribution) of disturbances that shape an ecosystem over a long time frame and broad spatial scale. Understanding the natural disturbance regime of an ecosystem can help scientists and practitioners better understand and manage the factors that affect ecosystem structure and function.

natural range of variation The variation of ecological characteristics and processes over scales of time and space that are appropriate for a given management application. In contrast to the generality of historical ecology, the natural range of variation concept focuses on a distilled subset of past ecological knowledge developed for use by resource managers; it represents an explicit effort to incorporate a past perspective into management and conservation decisions. The pre-European influenced reference period considered should be sufficiently long, often several centuries, to include the full range of variation produced by dominant natural disturbance regimes such as fire and flooding and should also include short-term variation and cycles in climate. The natural range of variation is a tool for assessing the ecological integrity and does not necessarily

constitute a management target or desired condition. The natural range of variation can help identify key structural, functional, compositional, and connectivity characteristics, for which plan components may be important for either maintenance or restoration of such ecological conditions (Forest Service Handbook 1909.12). See also **historical range of variation**.

natural regeneration Renewal of a tree crop by natural seeding, sprouting, suckering, or layering.

NCDE Coordinating Committee See **Northern Continental Divide Ecosystem Coordinating Committee**.

net change The difference in a measurement (such as road density) after on-the-ground changes are accounted for pre- and post-project; allows for temporary changes during a project. [NCDE]

no surface occupancy A stipulation in a fluid mineral lease that prohibits use or occupancy of the land surface in order to protect identified resource values. Lessees may develop the oil and gas or geothermal resources under the area restricted by this stipulation through the use of directional drilling from sites outside the no surface occupancy area.

no-action alternative The existing national forest plan, as amended.

non-attainment area An area within a State that exceeds the national ambient air quality standards.

non-consumptive water use The act of removing water from an available supply and utilizing it in a manner so that it returns to a waterbody.

non-denning season The time period when grizzly bears typically are not hibernating:

- West side of the Continental Divide: from 1 April through 30 November.
- East side of the Continental Divide: from 16 April through 30 November. [NCDE]

non-point source pollution A discharge to a waterbody from a diffuse source, such as polluted runoff from an agricultural area or precipitation.

Nordic skiing See **cross-country skiing**.

Northern Continental Divide Ecosystem A region identified in the Grizzly Bear Conservation Strategy encompassing about 27.3 million acres of land in western and central Montana that is one of five areas in the lower 48 States where grizzly bear populations occur. [NCDE]

Northern Continental Divide Ecosystem (NCDE) Coordinating Committee An interagency group that evaluates implementation of the Northern Continental Divide Ecosystem Grizzly Bear Conservation Strategy, promotes the exchange of data and information about the Northern Continental Divide Ecosystem grizzly bear population among agencies and the public, and makes recommendations to the management agencies regarding implementation of the strategy. Members of the interagency group may include Montana Fish, Wildlife & Parks; U.S. Fish & Wildlife Service; U.S. National Park Service; U.S. Forest Service; U.S. APHIS Wildlife Services; U.S. Geological Survey; U.S. Bureau of Land Management; the Blackfoot Tribe; and the Confederated Salish and Kootenai Tribes. [NCDE]

Northern Continental Divide Ecosystem (NCDE) food/wildlife attractant storage order See **food/wildlife attractant storage special order**.

Northern Region The USDA Forest Service Northern Region encompasses 25 million acres and is spread over five States. The region includes 12 national forests located in northeastern Washington, northern Idaho, and Montana as well as the national grasslands in North Dakota and northwestern South Dakota.

notice of intent An agency (e.g., the U.S. Forest Service) publishes a notice of intent in the Federal Register to inform the public of an upcoming environmental analysis and describe how the public can become involved in the preparation of the environmental impact statement. The notice of intent starts the scoping process, which is the period in which the Federal agency and the public collaborate to define the range of issues and possible alternatives to be addressed in the environmental impact statement.

noxious weed A legal term; an exotic plant species established or introduced into an area, regulated by law, that is typically aggressive, difficult to manage, and invasive. Noxious weeds may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses.

off-highway vehicle A motor vehicle designed for, or capable of, cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain (36 CFR § 212.1).

old forest See **old growth**.

old growth An ecosystem or community of forest vegetation that is distinguished by old trees and related structural attributes. This term is deliberately defined generically, and when used as such does not imply a specific quantity of such features as large trees and downed logs, a specific age of old trees, or specific characteristics associated with other structural components. These characteristics vary substantially by ecological regions, forest types, local conditions, literature source, and a host of other factors. See also **old-growth forest**.

old growth-associated species The group of wildlife species that is associated with old-growth forest.

old-growth forest A community of forest vegetation that is distinguished by large, old trees and related structural attributes occurring at levels that meet descriptions of old-growth forest types for the USDA Forest Service Northern Region (Green et al., 2011) and that provides habitat for old-growth-associated species. The primary measurable criteria that define old-growth forest in the Northern Region are basal area, trees per acre, size (d.b.h.), and age. Associated structural attributes for determining old-growth forest include the amount of dead/broken tops and decayed trees, amount and size of downed wood, and number of canopy layers (canopy layer diversity). Green et al. provide direction on the use and application of the old-growth forest definitions at the project level (see pp. 11-12). Refer to appendix C of the forest plan for more information on applying forest plan direction related to old-growth forest.

open motorized route density A moving window analysis calculation that applies to the primary conservation area portion of the Northern Continental Divide Ecosystem and includes Federal, State, and tribal roads and motorized trails that are open to wheeled motor vehicle use by the public for any part of the non-denning season. *Note:* Motorized routes closed only by sign or

order are considered to be open for purposes of this calculation. [NCDE] See also **moving window analysis**.

opening (related to the maximum opening size standard in the plan for a timber harvest) An opening is a forest patch in a seedling size class created as a result of one even-aged harvest operation (i.e., clearcut, seedtree, or shelterwood seed cutting). Large trees left to meet other desired conditions are not counted in the calculation of size class for determining the seedling classification. Adjacent seedling stands created as a result of an earlier harvest operation or due to natural disturbance are not considered part of an opening.

outfitting Renting on, or delivering to, National Forest System lands for pecuniary remuneration or other gain any saddle or pack animal, vehicle, boat, camping gear, or similar supplies or equipment (36 CFR § 251.51).

overstory The portion of the trees that form the uppermost canopy layer in a forest of more than one story.

passive crown fire A type of fire in which individual or small groups of trees torch out but in which solid flaming in the canopy cannot be maintained except for short periods. Passive crown fire encompasses a wide range of crown fire behavior, from the occasional torching of an isolated tree to a nearly active crown fire. Also called torching and candling.

patch An area distinguished from its surroundings by environmental discontinuities, such as a small area of early-seral successional forest (seedling/sapling size class) surrounded by mid-seral and late-seral successional forest (small to large tree size classes).

perennial A stream that flows continuously throughout most years and whose upper surface generally stands lower than the water table in the region adjoining the stream.

permit A special-use authorization that provides permission, without conveying an interest in land, to occupy and use National Forest System land or facilities for specified purposes and is both revocable and terminable (36 CFR § 251.51).

phenology Periodic biological phenomena (such as bird migration or plant flowering) correlated with climatic conditions.

phenotypically blister rust resistant Having the appearance of being genetically resistant to blister rust, a non-native disease affecting all five-needled pines (western white pine and whitebark pine, on the Flathead National Forest). This does not mean the tree must be completely free of any observable blister rust infections, but any infections should be relatively minor.

plan A document, or set of documents, that provides management direction for an administrative unit of the National Forest System developed under the requirements of the 2012 planning rule or a prior planning rule. See also **forest plan**.

plan area The National Forest System lands covered by a forest plan.

point source pollution A discharge to a waterbody from a single known pollutant source, such as a sewage treatment plant.

pole A tree between 5 and 8 inches diameter at breast height.

potential vegetation type/potential vegetation group An assemblage of habitat types on the basis of similar biophysical environments such as climate, moisture regimes, and soil characteristics. This biophysical environment influences the vegetation characteristics and ecosystem processes of the ecosystem. See also **broad potential vegetation type**.

precommercial thinning The selective felling, deadening, or removal of trees in a young stand dominated by trees less than 5 inches diameter at breast height. The primary purposes for thinning include to accelerate diameter increment on the remaining stems, to maintain a specific stocking or stand density range, to develop desired tree species composition, and/or to improve the vigor and quality of the trees that remain.

prescribed burning or prescribed fire A fire ignited via management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and National Environmental Policy Act requirements (where applicable) must be met prior to ignition (NWCG, 2017).

prevention measures Pertaining to invasive species management programs, these include a wide range of actions and activities to reduce or eliminate the chance of an invasive species entering or becoming established in a particular area. Prevention activities can include projects for education and awareness as well as more traditional prevention activities such as vehicle and equipment cleaning, boat inspections, or native plant restoration plantings. Restoration activities typically prevent invasive species infestations by improving site resilience and reducing or eliminating the conditions on a site that may facilitate or promote invasive species establishment (Forest Service Manual 2900).

primary conservation area An area identified in the Northern Continental Divide Ecosystem Grizzly Bear Conservation Strategy to be managed as a source area for the grizzly bear population where continuous occupancy by grizzly bears would be maintained. Habitat within the primary conservation area would receive the most stringent protection. The primary conservation area is the same area as the Northern Continental Divide Ecosystem's grizzly bear recovery zone identified in the draft Grizzly Bear Recovery Plan (USFWS, 1993).

productivity The capacity of National Forest System lands and their ecological systems to provide various renewable resources (such as timber) in certain amounts in perpetuity. In land management, productivity is an ecological term, not an economic term.

project An organized effort to achieve an outcome on National Forest System lands identified by location, tasks, outputs, effects, times, and responsibilities for execution (36 CFR § 219.19).

project (in grizzly bear habitat in the Northern Continental Divide Ecosystem) For purposes of the motorized access standards and guidelines in the primary conservation area of the Northern Continental Divide Ecosystem, refers to any temporary activity requiring construction of new roads, temporary roads, reconstruction or opening of restricted roads during the non-denning season, if such use exceeds administrative use levels (see **administrative use**). Activities involving recurring helicopter use (see **recurring helicopter use**) are also considered to be a project. [NCDE]

projected timber sale quantity The estimated quantity of timber meeting applicable utilization standards that is expected to be sold during the plan period. As a subset of the projected wood sale quantity, the projected timber sale quantity includes volume from timber harvest for any purpose from lands in the plan area based on expected harvests that would be consistent with the plan components. The projected timber sale quantity is also based on the planning unit's fiscal

capability and organizational capacity. The projected timber sale quantity is not a target nor a limitation on harvest and is not an objective unless the responsible official chooses to make it an objective in the plan.

projected wood sale quantity The estimated quantity of timber and other wood products that is expected to be sold from the plan area for the plan period. The projected wood sale quantity consists of the projected timber sale quantity as well as other woody material such as fuelwood, firewood, or biomass that is also expected to be available for sale. It includes volume from timber harvest for any purpose based on expected harvests that would be consistent with the plan components and is also based on the planning unit's fiscal capability and organizational capacity. The projected wood sale quantity is not a target nor a limitation on harvest, and it is not an objective unless the responsible official chooses to make it an objective in the plan.

proposed action A project, activity, or action that a Federal agency aims to implement or undertake and that is the subject of an environmental analysis. Proposed action is a specific term defined under the National Environmental Policy Act.

proposed species A type of animal or plant that is proposed through the Federal Register by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to be listed for protection under section 4 of the Endangered Species Act.

public involvement A process designed to broaden the information base upon which agency decisions are made. The process involves informing the public about Forest Service activities, plans, and decisions and public participation in the planning processes that lead to final decisionmaking.

rate of spread See **spread rate/rate of spread**.

reach A length of stream channel, lake, or inlet exhibiting, on average, uniform hydraulic properties and morphology.

rearing habitat A stable and protected micro-environment for a species to birth and rear their young. For example, for juvenile westslope cutthroat trout, the rearing habitat is primarily the pool environment found in streams.

record of decision A concise public document that records a Federal agency's decision(s) concerning a proposed action for which the agency has prepared an environmental impact statement (see Council on Environmental Quality and Department of Energy National Environmental Policy Act regulations at 40 CFR 1505.2 and 10 CFR 1021.315, respectively).

recovery The improvement in the status of a listed species to the point at which its listing as federally endangered or threatened is no longer appropriate (36 CFR § 219.19). This definition is for the purposes of the land management planning regulation at 36 CFR § 219 and Land Management Planning Handbook 1909.12 with respect to threatened or endangered species.

recovery plan A document that details actions or conditions necessary to promote improvement in the status of a species listed under the Endangered Species Act to the point at which listing is no longer appropriate.

recreation The set of recreation settings and opportunities on National Forest System lands that is ecologically, economically, and socially sustainable for present and future generations. See also **sustainable recreation**.

recreation event A recreational activity conducted on National Forest System lands for which an entry or participation fee is charged, such as animal, vehicle, or boat races; dog trials; fishing contests; rodeos; adventure games; and fairs.

recreation opportunity The opportunity to participate in a specific recreation activity in a particular recreation setting to enjoy desired recreation experiences and other benefits that accrue. Recreation opportunities include nonmotorized, motorized, developed, and dispersed recreation on land, water, and in the air. The six classes are as follows:

1. **primitive** The primitive recreational opportunity spectrum setting is large, remote, wild, and predominantly unmodified landscapes. There is no motorized activity and little probability of seeing other people. Primitive recreational opportunity spectrum settings are managed for solitude away from roads, people, and development. There are few, if any facilities or developments. Most of the primitive recreational opportunity spectrum settings coincide with designated wilderness boundaries.
2. **semiprimitive nonmotorized** The semiprimitive nonmotorized recreational opportunity spectrum settings include areas of the forest managed for nonmotorized use. Mountain bikes and other mechanized equipment are often present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area. These settings are not as vast or remote as the primitive recreational opportunity spectrum settings, but they offer opportunities for exploration, challenge, and self-reliance.
3. **semiprimitive motorized** The semiprimitive motorized recreational opportunity spectrum settings area(s) of the forests are managed for backcountry motorized use on designated routes. Routes are designed for off-highway vehicles and other high-clearance vehicles. This setting offers visitors motorized opportunities for exploration, challenge, and self-reliance. Mountain bikes and other mechanized equipment are also sometimes present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area or providing portals to adjacent areas of primitive, or semiprimitive, nonmotorized areas.
4. **roaded natural** The roaded natural setting is managed as natural appearing with nodes and corridors of development that support higher concentrations of use, user comfort, and social interaction. The road system is well defined and can typically accommodate sedan travel. System roads also provide easy access to adjacent semiprimitive motorized, semiprimitive nonmotorized and primitive areas.
5. **rural** The rural settings represent the most developed recreation sites and modified natural settings. Facilities are designed primarily for user comfort and convenience.
6. **urban** The urban setting is characterized by a substantially developed environment, although the background may have natural-appearing elements. A highly developed ski resort is an example of an urban setting on National Forest System land.

recreation opportunity spectrum A classification tool that provides a framework for defining the types of outdoor recreation opportunities the public might desire and identifies which portion of the spectrum a given national forest might be able to provide. The recreation opportunity spectrum is used to provide visitors with varying challenges and outdoor experiences. Travel management decisions are separate, project-level decisions that determine the specific areas and routes for motorized recreation consistent with areas identified in the plan as suitable for motorized recreation use. Just because an area is suitable for motorized use, does not mean motorized use is allowable everywhere in that setting.

recreation setting The social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities. The Forest Service uses the recreation opportunity spectrum to define recreation settings, categorizing them into six distinct classes: primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban. See also **recreation opportunity**.

recreation site A defined public recreation area.

recurring helicopter use A type of helicopter flight that involves multiple trips/passes each day consisting of low-altitude (< 500 meters above ground level) flights that continue for a duration longer than 48 consecutive hours. [NCDE]

reference vs. managed watershed A watershed is considered “reference” if it has not been grazed by livestock in the last 30 years, road densities are less than 0.5 kilometer per square kilometer, riparian road densities are less than 0.25 kilometer per square kilometer, and there has not been any historic dredge or hardrock mining in riparian areas. Typically, this is a wilderness watershed. All other watersheds are considered “managed.”

reforestation The renewal of forest cover by planting of seedlings, seeding, or natural means (such as seed produced from existing trees on the site).

refugium (plural: refugia) An area that a population of organisms can inhabit and survive a period of unfavorable conditions, such as climate change. The area may serve as a center of relict forms from which a new dispersion and speciation may take place after climatic readjustment.

regeneration The renewal of a forest, whether by natural or artificial means. Natural regeneration creates a new generation (age class) of trees by natural seeding, sprouting, suckering, or layering. Artificial regeneration creates a new age class of trees by planting of seedling trees or seeding (by hand, helicopter, etc.). This term may also apply specifically to the new generation of trees that exists on a site.

regeneration harvest The cutting of trees for the purpose of initiating a new seedling cohort (age class) of trees. Primary even-aged regeneration methods are clearcutting, seedtree and shelterwood. Primary uneven-aged harvest methods are group or individual tree selection. Also may be referred to as regeneration method.

Region 1 See **Northern Region**.

regulated timber harvest See **scheduled timber harvest**.

rehabilitation (of dispersed recreation sites) Management activities to reduce human impacts on a site that has been damaged; can include, but is not limited to, hardening of site, use of natural or manmade barriers to deter site growth and/or access, planting vegetation, modifying slope access to site,

reserve tree A live tree that is left in place within timber harvest areas and not removed during the harvest operation. Reserve trees are left to serve multiple purposes as determined at the site-specific level, such as providing seed for forest regeneration, maintaining a very large tree component and wildlife habitat values, helping to meet scenic integrity objectives, contributing to forest structural diversity, and serving as replacement snags.

resilience (ecology) The capacity of an organism, community, or ecosystem to maintain or regain normal function and development following one or more disturbances.

resistance (ecology) The ability of an organism, population, community, or ecosystem to remain unchanged by withstanding perturbations (such as fire or drought) without significant loss of structure or function.

resource selection function The relative probability of an animal using a unique set of habitat (landscape) characteristics. For studies involving radio-collared animals, the “use” of landscape combinations is compared to the “availability” of those combinations in a designated study area.

responsible official The official with the authority and responsibility to oversee the planning process and to approve a plan, plan amendment, and plan revision.

restoration The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed; ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems’ sustainability, resilience, and health under current and future conditions (36 CFR § 219.19).

riffle A shallow rapid where the water flows swiftly over completely or partially submerged obstructions (rocks, etc.) to produce surface agitation but where standing waves are absent.

riparian area A three-dimensional ecotone of interaction that includes terrestrial and aquatic ecosystems that extend into the groundwater, above the canopy, outward across the floodplain, up the near slopes that drain to the water, laterally into the terrestrial ecosystem, and along the water course at variable widths.

riparian ecosystem A transition between the aquatic ecosystem and the adjacent upland terrestrial ecosystem. A riparian ecosystem is identified by soil characteristics and by distinctive vegetative communities that require free or unbounded water.

riparian habitat conservation area (pertains to alternative A only, from INFISH amendment of the 1986 forest plan) A portion, or portions, of the watershed where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. Riparian habitat conservation area widths are defined as follows. Note: the height of a site-potential tree is the expected average maximum height a tree in the dominant crown class (upper forest canopy layer) would achieve, given the site productivity).

- **category 1, fish-bearing streams:** Riparian habitat conservation areas consist of the stream and the area on either side of the stream extending from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100 year floodplain, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet, including both sides of the stream channel), whichever is greatest.
- **category 2, permanently flowing non-fish-bearing streams:** Riparian habitat conservation areas consist of the stream and the area on either side of the stream extending from the edges of the active channel to the top of the inner gorge, or to the outer edges of the riparian vegetation, or to a distance equal to the height on one site-potential tree, or 150 feet slope distance (300 feet, including both sides of the stream channel), whichever is greatest.

- **category 3, ponds, lakes, reservoirs, and wetlands greater than 1 acre:** Riparian habitat conservation areas consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or to the distance of the height of one site-potential tree, or 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs, or from the edge of the wetland, pond, or lake, whichever is greatest.
- **category 4, seasonally flowing or intermittent streams, wetlands less than one acre, and lands identified as landslide prone:** This category includes features with high variability in size and site-specific characteristics. At a minimum, the riparian habitat conservation area must include (1) the intermittent stream channel and the area to the top of the inner gorge; (2) the intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation; (3) for priority watersheds as identified in appendix E, the area from the edges of the stream channel, wetland, or landslide-prone terrain to a distance equal to the height of one site-potential tree or 100 feet slope distance, whichever is greatest; or (4) for watersheds not identified as priority watersheds, the area from the edges of the stream channel, wetland, or landslide-prone terrain to a distance equal to the height of one half site-potential tree or 50 feet slope distance, whichever is greater.

riparian management zone Riparian management zones are areas adjacent to perennial and intermittent streams, wetlands, ponds, lakes, and reservoirs, as defined by standard FW-STD-RMZ-01.

riparian wildlife habitat An environment that occurs along lakes, rivers, streams, springs, and seeps where the vegetation and microclimate are influenced by year-round or seasonal water and associated high-water tables. Plant and animal species in these areas are more productive and diverse than on nearby uplands, making these areas very important to many wildlife species.

road A motor vehicle route more than 50 inches wide, unless identified and managed as a trail (36 CFR 212.1, Forest Service Manual 7705):

decommissioned: An unneeded road that has been stabilized and restored to a more natural state (36 CFR § 212.1). Decommissioned roads do not count towards total motorized route density as long as they meet the definition of impassable.

forest road or trail: A route wholly or partly within or adjacent to and serving National Forest System lands that is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources (36 CFR § 212.1 – Definitions).

impassable: A road that has been treated in such a manner that the road is blocked and there is little resource risk if road maintenance is not performed on a regular basis (self-maintaining). These roads are not counted in the total motorized route density as long as the road (generally the first 50 to 300 feet) has been treated to make it inaccessible to wheeled motorized vehicles during the non-denning season. Roads may become impassable due to a variety of causes, including but not limited to one or more of the following: natural vegetation growth, road entrance obliteration, scarified ground, fallen trees, boulders, or culvert or bridge removal. Impassable roads may remain on the inventoried road system if use of the road is anticipated at some point in the future. Some, but not all, roads placed in intermittent stored service may be impassable. [NCDE]

intermittent stored service/intermittent service road, closed to traffic: The road is in a condition such that there is little resource risk if maintenance is not performed.

maintenance level: The level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria (Forest Service Handbook 7709.59, 62.32):

Level 1: Assigned to roads that have been placed in storage between intermittent uses. The period of storage must exceed 1 year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns.

Level 2: Assigned to roads open for use by high-clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations.

Level 3: Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.

Level 4: Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds.

Level 5: Assigned to roads that provide a high degree of user comfort and convenience.

National Forest System: A forest road other than a road that has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority (36 CFR § 212.1)

reclaimed: (pertains to alternative A only; from appendix TT of the 1986 forest plan) A reclaimed road has been treated in such a manner so as to no longer function as a road or trail, and it has a legal closure order until reclamation treatment is effective. This can be accomplished through one or a combination of treatments, including recontouring to original slope, placement of natural debris, or revegetation with shrubs or trees. The following terms apply to reclaimed roads:

- administrative use: Administrative use of reclaimed roads may not occur.
- closure device: A legal closure order should be utilized until the reclamation treatment is effective. Naturally occurring local materials and native plant species should be utilized in the creation of barriers and revegetation of roadways. Minimum treatment requirements include:
 - (a) The entire road will receive treatment such that maintenance or entries to maintain “road drainage” is not needed. This will require removal of culverts or other water passage structures that are aligned with stream channels. In most cases, this will also require that road-related sediment sources be repaired and the road reworked to eliminate ditch water flow without the aid of cross drain culverts.
 - (b) The first portion of the road (typically 200 to 600 feet) will be treated in such a manner so as to preclude its use as a motorized or nonmotorized travelway. This will include (1) making the road junction area unattractive as a travelway and (2) treating the remainder of the first portion to make awareness of the road improbable and preclude motorized or nonmotorized use.

(c) Treat the road, other than the first portion, in a way that will discourage its use as a motorized or nonmotorized travelway. Treatment should include sporadic placement of natural debris over most of the road length and surface treatment to encourage natural, planted, or seeded revegetation.

(d) It is the intent in many cases that the reclaimed road no longer function as a road again. Recontouring should be considered where resource protection and economics are favorable.

(e) The acceptable lag time for the treatment to become effective and the expected persistence of people to continue to use a road should dictate the amount and type of initial, and perhaps follow-up, treatment required. Greater initial revegetation and barrier work will be required if the expectation is to meet reclaimed road criteria in 1 year as opposed to 10 years or if heavy off-road vehicle pressure is expected on the barrier structures. These factors should be described and considered in the design of treatments for each site.

use of reclaimed roads in calculations: Reclaimed roads that fully satisfy the definition of a reclaimed road will not be included in calculations of open motorized access density, total motorized access density, or security core area. Roads that have been treated but that do not yet fully satisfy the definition of a reclaimed road will be included in calculations for total motorized access route density. These roads will not be included in calculations for open motorized access route density or security core area if use is low intensity and nonmotorized.

conversion of reclaimed roads to trails: Roads scheduled for reclamation to meet total motorized access density objectives may be converted to trails if necessary to maintain access to the existing trail system. Other actions to convert a reclaimed road to a trail must be made in consultation with the U.S. Fish and Wildlife Service.

temporary: A road necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road and that is not included in a forest transportation atlas (36 CFR § 212.1). In the Northern Continental Divide Ecosystem primary conservation area, temporary roads will meet the definition of impassable when no longer needed. [NCDE]

restricted: Roads, or segments thereof, may be restricted to use by certain classes of vehicles or types of traffic as provided in 36 CFR part 261.

restricted (pertains to alternative A only, from appendix TT of the 1986 forest plan, as amended): A road on which motorized vehicle use is restricted during the entire non-denning period. The road requires physical obstruction, and motorized vehicle use in the non-denning period is legally restricted by order.

Administrative Use: Administrative use includes contractors and permittees in addition to agency employees. Administrative activities should be planned so as to not preclude use by bears of important or limited habitats.

(a) Within security core areas, motorized administrative use may not occur on restricted roads during the non-denning period.

(b) Outside of security core areas, motorized administrative use is acceptable at low intensity levels, as defined by either (1) existing cumulative effects analysis models (currently one to six vehicles/week for the Northern Continental Divide Ecosystem WEST CEM) or (2) minor activities that do not exceed 30 days duration. If administrative use must exceed low intensity levels, reconsultation with the U.S. Fish and Wildlife Service will occur.

Closure Device: A legal closure order and a physical obstruction must be in place for all restricted roads. The closure device should be of a type and design that is capable of precluding use by the type/class of motorized vehicle expected to be using the site or area. If physical control of motorized vehicles is not possible and rates of use are unacceptable, law enforcement activities should be utilized to enhance success.

(a) Within security core areas, the obstruction must be permanent and includes tank traps, large boulders, and dense vegetation. Although restricted roads are acceptable within security core areas, reclamation is the preferred treatment method.

(b) Outside of security core areas, gates and other more portable closure devices are acceptable.

Duration of Restriction:

(a) Within security core areas, the restriction must be in place for a minimum of 10 years. Due to this time frame and the lack of administrative motorized access for inspection and maintenance, strong consideration should be given to treating road drainage similar to that used for reclaimed roads. If road drainage is not reworked, a monitoring plan must be developed and its implementation ensured.

(b) Outside of security core areas, restrictions for an individual road must be in place for a minimum of one year, but may be changed between years so long as bear management subunit objectives are maintained.

use of restricted roads in calculations: All restricted roads will be included in calculating total motorized access route density. Seasonally restricted roads that are open during the non-denning period will be considered open for the purpose of calculating open access density.

conversion of reclaimed roads to trails: Roads scheduled for reclamation to meet total motorized access density objectives may be converted to trails if necessary to maintain access to the existing trail system. Other actions to convert a reclaimed road to a trail must be made in consultation with the U.S. Fish and Wildlife Service.

road management objectives Road management objectives document the intended purpose of an individual road in providing access to implement a land and resource management plan as well as decisions about applicable standards for the road. Road management objectives should be based on management area direction and access management objectives. Road management objectives contain design criteria, operation criteria, and maintenance criteria.

roadless area characteristics Resources or features that are often present in and characterize inventoried roadless areas. These include

- high-quality or undisturbed soil, water, and air;
- source of public drinking water;
- diversity of plant and animal communities;
- habitat for threatened, endangered, candidate, proposed, and sensitive species on large areas;
- natural-appearing landscapes with high or very high scenic integrity;
- reference landscapes (the body of knowledge about the effects of management activities over long periods of time and on large landscapes is very limited; reference landscapes of relatively undisturbed areas serve as a barometer to measure the effects of development on other parts of the landscape);
- primitive, semiprimitive nonmotorized, and semiprimitive motorized recreation opportunity classes of dispersed recreation;
- other locally identified unique characteristics; and
- traditional cultural properties and sacred sites.

rotation The number of years (including the regeneration period) required to establish and grow timber under an even-aged management system to a specified condition or maturity for regeneration harvest.

running average A method for computing the average of a stream of numbers for a specified period. A 10-year running average computes the mean for the values in the current year plus the previous 9 years. A running average is commonly used with time series data to smooth out short-term fluctuations and highlight longer-term trends or cycles. [NCDE]

sacred site A place that has special religious significance to a group.

salable minerals Common varieties of sand, stone, gravel, cinders, clay, pumice, pumicite, etc. The Forest Service has the authority to dispose of these materials on public lands through a variety of methods. The disposal of these materials is discretionary.

salvage harvest A commercial removal (timber harvest) of dead, damaged, or dying trees. Collecting firewood for personal use is not considered salvage harvest.

sapling A young tree that is larger than a seedling but smaller than a pole or small tree; typically 5 to about 25 feet tall and 1 to 5 inches diameter at breast height.

sawtimber A collection of logs cut from trees with a minimum diameter (typically greater than 6 or 7 inches diameter at breast height) or trees of the same minimum diameter and of sufficient length and stem quality to be suitable for conversion to lumber.

scarification The removal of the surface organic material (duff) of an area, typically to prepare the site for reforestation.

scenic character A combination of the physical, biological, and cultural images that give an area its scenic identity and contribute to its sense of place; scenic character provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity.

scenic integrity objectives Developed in coordination with the recreational settings, managerial direction, and the scenic class that were developed from the scenic inventory.

- very high integrity: The valued scenery appears natural or unaltered. Only minute visual disturbances to the valued scenery, if any, are present.
- high integrity: The valued scenery appears natural or unaltered, yet visual disturbances are present; however, they remain unnoticed because they repeat the form, line, color, texture, pattern, and scale of the valued scenery.
- moderate integrity: The valued scenery appears slightly altered. Noticeable disturbances are minor and visually subordinate to the valued scenery because they repeat its form, line, color, texture, pattern, and scale.
- low integrity: The valued scenery appears moderately altered. Visual disturbances are co-dominant with the valued scenery and may create a focal point of moderate contrast. Disturbances may reflect, introduce, or “borrow” valued scenery attributes from outside the landscape being viewed.

scheduled timber harvest A commercial removal of timber that is planned and conducted using a rotation age (the age planned to harvest timber in the future). Rotation age is determined based on site productivity, site conditions, and forest plan desired conditions. Timber harvest is only scheduled on lands suitable for timber production.

scion A detached living portion of a plant, such as a bud or shoot, often a branch tip, that is grafted onto the root-bearing part of another plant.

scoping The notice of intent starts the scoping process, which is the period in which the Federal agency and the public collaborate to define the range of issues and possible alternatives to be addressed in an environmental impact statement. See also **notice of intent**.

secure core (grizzly bear) An area of the Northern Continental Divide Ecosystem primary conservation area 500 meters or more from (1) a route open to public wheeled motorized use during the grizzly bear non-denning season, (2) a gated route, or (3) a route closed only with a sign that is greater than or equal to 2,500 acres in size. Roads restricted with physical barriers (not gates), decommissioned roads, impassable roads, temporary roads, over-the-snow motorized vehicle routes and areas, and nonmotorized trails are allowed within secure core, unless otherwise restricted (e.g., by other national forest plan direction).

security core (pertains to alternative A only, see appendix TT of the 1986 forest plan, as amended) An area on the Flathead National Forest that is at least 0.3 mile from open roads and high-intensity-use nonmotorized trails. Restricted roads may occur within the security core area provided they have substantial immobile closure devices and legal closure to motorized use during the non-denning period. Legal closure orders for individual roads or trails, or an area closure, may be utilized. Areas must be at least 2,500 acres in size and, once established and effective, remain in place for at least 10 years. Appendix TT of the 1986 forest plan (USDA, 1995) provides the following management direction for the security core:

- restricted roads in security core areas: Restricted roads may occur within security core areas, but they may not receive motorized use during the non-denning period. The number of restricted roads in security core areas should be minimized, with reclamation of roads the preferred treatment. Restriction of roads in security core areas requires adequate permanent physical barriers and legal closure order(s). Restricted roads within

security core areas may not receive high levels of nonmotorized use. High-intensity nonmotorized use is defined as receiving 20 or greater parties per week, based upon the unified Cumulative Effects Model (April 1990) values.

- duration of security core areas: A security core area, once established and effective, must remain in place and operational for a minimum of 10 years. The 10-year period begins at the time all criteria for the security core area are met. Lag time required for management actions to become effective (i.e., revegetation or road reclamation) will not be considered a part of the 10-year period but will be in addition to the 10-year period.
- size and proximity of security core areas: The minimum size for a security core area is 2,500 acres. It is desirable to have large, contiguous blocks of security core area within each bear management subunit. If a block straddles a bear management subunit boundary, consider the whole security core area when determining size but only the amount within an individual subunit when determining percent quantities.
- composition of security core area: Security core area within a bear management subunit should contain seasonal habitat approximately proportional to its availability in the bear management subunit. Seasonal availability (snow cover) of spring habitat should be considered in addition to habitat value.
- vegetation management within security core areas: Vegetation management may occur within security core areas so long as the objective and criteria for security core area continues to be met. Access use levels must be met during the non-denning period, and this requires that many planned activities, and all motorized activities, occur during the denning period. Exceptions to established criteria require reconsultation with the U.S. Fish and Wildlife Service.
- reporting requirements: A monitoring report outlining activities and progress towards objectives for open motorized access, total motorized access, and security core areas will be developed annually, with a copy submitted to the U.S. Fish and Wildlife Service in December of each year.

security habitat An area with low levels of human disturbance or habitat that allows a wildlife species to remain in a defined area despite an increase in stress or disturbance. The components of security habitat can include vegetation, topography, the size of the patches of vegetation, road density, distance from roads, intensity of the disturbance, and seasonal timing of the disturbance. This general definition covers most uses of the term security habitat, except for elk and grizzly bear, which have specific definitions.

sediment Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site of origin by air, water, gravity, or ice.

seedling A young tree that has just germinated but has not yet reached sapling size, typically between 1 and 5 feet tall.

seedling/sapling A size category for forest stands in which trees less than 5 inches in diameter and less than about 25 feet tall are the predominant vegetation.

seedtree harvest A tree-cutting method used to regenerate a stand in which nearly all live trees are removed from an area except for a small number of trees that are left singly or in small groups. Regeneration may be natural or artificial (planting). See also **even-aged regeneration harvest**.

seedtree with reserves The application of the seedtree harvest method with the intention of retaining or reserving all or a portion of the seed trees indefinitely (e.g., for many decades or for the entire rotation) for future stand structure and/or other resource benefits.

selection harvest A tree-cutting method used to create and maintain an uneven-aged stand by periodically removing some trees within multiple size classes either singly or in small groups or strips. See also **group selection harvest** and **uneven-aged harvest**.

seral A biotic community that is developmental; a transitory stage in an ecologic succession.

shade-intolerant plant A plant species that does not grow well or dies from the effects of too much shade.

shade-tolerant plant A plant species that can develop and grow successfully in the shade of other plants.

shelterwood harvest A tree-cutting method used to regenerate a stand in which some of the trees are left (more trees than with the seedtree method) that provide shade and protection for the regenerating conifer seedlings. This technique may be performed uniformly throughout the stand, in strips, or in groups. Regeneration may be natural or artificial (planting). See also **even-aged regeneration harvest**.

shelterwood with reserves The application of the shelterwood method with the intention of retaining or reserving all or a portion of the shelterwood trees indefinitely (e.g., for many decades or for the entire rotation) for future stand structure and/or other resource benefits.

significant cave According to the criteria for significant caves (36 CFR 290.3 (c)), a significant cave on National Forest System lands shall possess one or more of the following features, characteristics, or values.

1. Biota. The cave provides seasonal or yearlong habitat for organisms or animals, or contains species or subspecies of flora or fauna native to caves, or are sensitive to disturbance, or are found on State or Federal sensitive, threatened, or endangered species lists.
2. Cultural. The cave contains historic properties or archeological resources (as defined in Parts 800.2 and 296.3 of this chapter respectively, or in 16 U.S.C. 470, et seq.), or other features included in or eligible for inclusion on the National Register of Historic Places because of their research importance for history or prehistory, historical associations, or other historical or traditional significance.
3. Geologic/mineralogic/paleontologic. The cave possesses one or more of the following features:
 - (i) Geologic or mineralogic features that are fragile, represent formation processes that are of scientific interest, or that are otherwise useful for study.
 - (ii) Deposits of sediments or features useful for evaluating past events.
 - (iii) Paleontologic resources with potential to contribute useful educational or scientific information.
4. Hydrologic. The cave is a part of a hydrologic system or contains water which is important to humans, biota, or development of cave resources.

5. Recreational. The cave provides or could provide recreational opportunities or scenic values.
6. Educational or scientific. The cave offers opportunities for educational or scientific use; or, the cave is virtually in a pristine state, lacking evidence of contemporary human disturbance or impact; or, the length, volume, total depth, pit depth, height, or similar measurements are notable.

silvicultural diagnosis The compiling, summarizing, evaluation, and analyzing of forest stand and/or landscape data. Includes describing desired conditions, interpreting management direction, and determining feasible alternative silvicultural systems and initial treatments. Integrates other resource conditions and considerations such as soils, wildlife habitat, and visual sensitivity.

silvicultural prescription A written document that describes management activities needed to implement one or more silvicultural treatments or a treatment sequence. The prescription documents the results of the analysis during the diagnosis phase.

silvicultural system A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. It includes cultural management practices performed during the life of the stand, such as regeneration cutting, thinning, and the use of genetically improved tree seeds and seedlings to achieve multiple resource benefits.

silviculture The theory and practice of controlling the establishment, composition, growth, and quality of forest stands in order to achieve the objectives of management.

SIMPPLLE model An abbreviation for Simulating Patterns and Processes at Landscape Scales, this is a model that simulates changes in vegetation on landscapes in response to both natural disturbances and management activities as they interact with climatic conditions. This model was used in the forest plan revision for two purposes: to calculate the natural range of variation for vegetation conditions and to project the vegetation conditions of the alternatives across the Forest into the future for analysis in the environmental impact statement.

site preparation A general term for a variety of activities that remove competing vegetation, slash, and other debris that may inhibit the reforestation effort.

site productivity The combined effect of physical and climate properties, soil depth, texture, nutrient load, precipitation, temperature, slope, elevation, and aspect on tree growth of a specific area of land.

size class See **forest size class**.

ski area A site and attendant facilities expressly developed to accommodate alpine or Nordic skiing and from which the preponderance of revenue is generated by the sale of lift tickets and fees for ski rentals, skiing instruction, and trail passes for the use of permittee-maintained ski trails. A ski area may also include ancillary facilities directly related to the operation and support of skiing activities (36 CFR § 251.51).

skid trail A trail through the woods used to access timber for skidding (dragging) to a landing with mechanized equipment (i.e., a rubber-tired skidder) for loading onto log trucks.

slash The residue left on the ground after felling and other silvicultural operations or accumulated there as a result of storms, fire, or natural pruning.

small livestock See **livestock**.

snag A standing dead tree usually greater than 5 feet in height and 6 inches in diameter at breast height.

snow intercept cover A forest canopy that lessens the snow depths for wintering big game animals so that they can forage and travel about.

snowshoe hare habitat An area within boreal and upper montane forests in North America with cold, moderately deep winter snowpack and dense horizontal cover in the understory. During the winter, hares are restricted to areas where young trees or shrubs grow densely (thousands of woody stems per hectare) and are tall enough to protrude above the snow during winter or to where numerous overhanging boughs of mature conifer trees touch the snow surface, providing cover and browse. Winter snowshoe hare habitat develops primarily in the later phase (15 to 40 years post-disturbance) of the stand initiation structural stage and in multistory mature stands. Snowshoe hare habitat is defined at the scale of a forest stand, which is a minimum of five acres, consistent with the minimum home range size of a snowshoe hare in northwest Montana.

soil function Any ecological service, role, or task that soil performs, such as (1) soil biological services that provide a medium for roots, fungi, and micro-organisms in the upper sections of the soil, (2) soil hydrology where soil absorbs, stores, and transmits water both vertically and horizontally, (3) nutrient cycling where soil stores, moderates the release of, and cycles nutrients and other elements, (4) carbon storage, (5) physical support for plants where soil has a porous structure to allow passage of air and water, withstand erosive forces, and provide a medium for plant roots, and (6) filtering and buffering to protect the quality of water, air, and other resources.

species of conservation concern A species other than a federally recognized threatened, endangered, proposed, or candidate species that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long term in the plan area (36 CFR § 219.9). More information about species of conservation concern on the Flathead National Forest is available at <http://bit.ly/NorthernRegion-SCC>.

Spectrum model A software modeling system designed to assist decisionmakers in exploring and evaluating multiple resource management choices and objectives. Management actions are applied to landscapes through a time horizon and display resulting outcomes. Management actions are selected to achieve desired goals (desired conditions and objectives) while complying with all identified management constraints (standards and guidelines). This model was used to estimate potential vegetation treatments and timber product outputs over time for the Flathead plan.

spread rate/rate of spread A measure of the final headfire extent (in the direction of maximum spread).

stand A community of trees occupying a specific area and sufficiently uniform in canopy composition, age, and size class to be a distinguishable unit, forming a single management entity.

stand initiation structural stage A phase that occurs in the years immediately following a stand-replacing disturbance. The growing space is being reoccupied by trees, shrubs, forbs and grass species. Because trees are small (i.e., seedlings and saplings) most of the crowns are not

touching one another and the trees are free to grow. This stage is typically characterized by highly diverse plant species, especially of species that are shade-intolerant (Oliver & Larson, 1996).

stand-replacing disturbance An agent such as fire, blowdown, insect or disease epidemic, or timber harvest that kills or removes enough trees (usually considered 80 percent or more of the tree component) to result in an early-seral successional forest.

stem exclusion structural stage (or closed canopy structural stage) A phase that typically occurs after the stand initiation structural stage, where trees have grown taller, with wider crowns, and have occupied the growing space, creating a closed canopy forest. Because the tree crowns are mostly touching or intertwined, little light reaches the forest floor, so understory plants (including smaller trees) are shaded and grow more slowly. Species that need full sunlight usually die; shrubs and herbs may become dormant. New tree establishment is mostly precluded by a lack of sunlight or moisture (Oliver & Larson, 1996).

stocking A measure of timber stand density as it relates to the optimum or desired density for achieving a given management objective.

stormproofing A stormproofed road is one where measures have been taken to upgrade the road so as to minimize the risk and potential magnitude of future erosion and sediment delivery. It generally consists of reducing hydrologic connectivity; identifying and treating potential road failures (mostly fill slope failures) that could fail and deliver sediment to streams; and reducing the risk of stream crossing failures and stream diversion.

stressor (ecology) See **ecosystem stressor**.

structural stage A particular forest condition characterized by a set of forest structural characteristics (such as tree diameters, tree heights, tree densities, canopy layers) that is representative of a particular period of stand development. See also **stand initiation structural stage** and **stem exclusion structural stage**.

structure See **forest structure**.

substrate A mineral and/or organic material that forms the streambed (i.e., the stream bottom).

subwatershed A 6th level hydrologic unit, as defined in the U.S. Geological Survey hierarchical system of watersheds. Subwatersheds have an average size of 10,000-40,000 acres.

succession A predictable process of changes in structure and composition of plant and animal communities over time. Conditions of the prior plant community or successional stage create conditions that are favorable for the establishment of the next stage.

successional stage/seral stage A stage or recognizable condition of a plant community occurring during its development from a relatively unvegetated condition to a mature plant community. See **early-successional stage/seral stage**, **mid-successional stage/seral stage**, and **late-successional stage/seral stage**.

suitability of lands Specific lands within a plan area will be identified as suitable for various multiple uses or activities based on the desired conditions applicable to those lands. The plan will also identify lands within the plan area as not suitable for uses that are not compatible with desired conditions for those lands. The suitability of lands need not be identified for every use or activity. Suitability identifications may be made after consideration of historic uses and of issues

that have arisen in the planning process. Every plan must identify those lands that are not suitable for timber production (36 CFR 219.7(e)(1)(v)). The terms suitable and suited and not suitable and not suited can be considered the same.

summer range or habitat A part of the overall range or habitat of a wildlife species where the majority of individuals are located between spring green-up and the first heavy snowfall; in some areas, winter range and summer range may overlap.

sustainability The capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs. “Ecological sustainability” refers to the capability of ecosystems to maintain ecological integrity; “economic sustainability” refers to the capability of society to produce and consume or otherwise benefit from goods and services, including contributions to jobs and market and nonmarket benefits; and “social sustainability” refers to the capability of society to support the network of relationships, traditions, culture, and activities that connect people to the land and to one another and support vibrant communities (36 CFR § 219.19).

sustainable recreation The set of recreation settings and opportunities on the National Forest System that is ecologically, economically, and socially sustainable for present and future generations.

sustained yield limit The amount of timber, meeting applicable utilization standards, “which can be removed from [a] forest annually in perpetuity on a sustained-yield basis” (National Forest Management Act, sec. 11; 16 U.S.C. 1611; 36 CFR § 219.11(d)(6)). The sustained yield limit is the volume that could be produced in perpetuity on lands that *may be suitable* for timber production. Calculation of the sustained yield limit includes volume from lands that are deemed not suitable for timber production based upon compatibility with the desired conditions for those lands. The calculation of the sustained yield limit is not limited by a land management plan desired condition, other plan components, or the planning unit’s fiscal capability and organizational capacity. The sustained yield limit is not a target but is a limitation on harvest, except when the plan allows for a departure.

system road See **road—National Forest System**.

threatened species A species that the Secretary of the Interior or the Secretary of Commerce has determined is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Threatened species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act. Threatened species are listed at 50 CFR §§ 17.11, 17.12, and 223.102.

timber Trees grown for commercial uses, such as in building or carpentry. May also refer to the wood itself, especially when suitable for various building purposes.

timber harvest The removal of trees of sufficient size and quality to furnish raw material for wood fiber and other multiple-use purposes (36 CFR 219.19). A commercial activity with the primary purpose of selling wood products.

timber management The growing of, tending to, commercial harvesting of, and regeneration of crops of trees.

timber production The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use (36 CFR § 219.19).

torching index The open wind speed (measured or forecasted for a standard height [6.1 meters] above the tallest vegetation) at which crown fire activity can initiate for the specified fire environment.

total maximum daily load (TMDL) the total maximum daily load is the maximum amount of a pollutant a watershed can receive and still meet water quality standards. See appendix E of the forest plan for additional information on total maximum daily loads.

total motorized route density A moving window analysis calculation that applies to the primary conservation area portion of the Northern Continental Divide Ecosystem and includes Federal, State, and tribal roads and motorized trails that do not meet the definition of an impassable road. [NCDE] See also **moving window analysis**.

traditional cultural property A cultural resource that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community. The entity evaluated for eligibility for inclusion in the National Register of Historic Places must be a tangible property, that is, a district, site, building, structure, or object as defined in 36 CFR 64.4 (Forest Service Manual 2360.5).

trail A route 50 inches or less in width or a route over 50 inches in width that is identified and managed as a trail (36 CFR § 212.1).

trail class The prescribed scale of development for a trail, representing its intended design and management standards.

trail management objectives Documentation of the intended purpose and management of a National Forest System trail based on management direction, including access objectives.

underburn A fire that consumes surface fuels but not the overstory canopy.

understory The trees and other woody species that grow under a more or less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth.

uneven-aged harvest A tree-cutting method with the purpose of creating and maintaining an uneven-aged stand structure. Individuals or small groups of trees are removed to allow room for new seedlings to become established and young trees to grow. See also **regeneration harvest**, **group selection harvest**, and **selection harvest**.

uneven-aged stand A group of trees that differ significantly in age. Generally, there are at least three well-defined (i.e., the spread of ages exceeds 25% of the planned life span) and well-represented age classes, differing in height, age, and diameter. The age classes may occur in a small patch mosaic pattern or as individual trees scattered throughout the stand. Sometimes referred to as "multi-cohort" or "all-aged" stands.

United States Code (U.S.C.) A consolidation and codification by subject matter of the general and permanent laws of the United States.

untrammeled In the context of the Wilderness Act, an area where human influence does not impede the free play of natural forces or interfere with natural processes in the ecosystem.

utilization standards The specifications for merchantable forest products offered in a timber sale.

valid existing rights A legal interest that attaches to a land or minerals estate that cannot be divested from the estate until the interest expires or is relinquished.

vegetation management An activity that changes the composition, structure, or other characteristics of vegetation to meet specific objectives. A variety of vegetation treatments or silvicultural prescriptions may be used, with the most common methods being timber harvest (may be regeneration, intermediate, or salvage harvests), precommercial thinning (i.e., in sapling stands), fuel reduction treatments (may be commercial or noncommercial products), prescribed fire, or tree or shrub planting.

viable population A population of a species that continues to persist over the long term with sufficient distribution to be resilient and adaptable to stressors and likely future environments (36 CFR § 219.19).

viewshed The visible portion of the landscape seen from viewpoints. Viewpoints can include residences, recreational facilities, and travelways.

vulnerability (ecology) The degree to which a system is susceptible to, and unable to cope with, the adverse effects of a disturbance or stressor (i.e., climate change).

water quality The physical, chemical, and biological properties of water.

water yield The runoff from a watershed, including groundwater outflow.

watershed A region or land area drained by a single stream, river, or drainage network; a drainage basin.

watershed, managed See **reference vs. managed watershed**.

watershed, reference See **reference vs. managed watershed**.

watershed condition The state of a watershed based on physical and biogeochemical characteristics and processes.

watershed condition framework A comprehensive approach to watershed management that proactively implements integrated restoration on priority watersheds on national forests and grasslands. See appendix E of the forest plan for more information.

weighted average/weighted mean Similar to an arithmetic mean or average, where instead of all data points contributing equally to the final average, some data points contribute more than others. In the example of patch sizes of early successional seedling/sapling forests, the data point is the patch. Patches are “weighted” by their acreage, and thus larger patches will contribute more to the determination of average than smaller patches. This statistic gives insight into how large the largest patches really are and how the individual patches are distributed along the range from smallest to largest patch size.

wetland An area that under normal circumstances has hydrophytic vegetation, hydric soils, and wetland hydrology.

wheeled motorized travel Motorized travel using a wheeled motorized vehicle on terra (ground).

wild and scenic river A waterway designated by Congress as part of the National Wild and Scenic Rivers System, which was established in the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271, 1271–1287).

wilderness An area of land designated by Congress as part of the National Wilderness Preservation System that was established in the Wilderness Act of 1964 (16 U.S.C. 1131–1136).

wilderness character Untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation and other features and values.

- Untrammeled. The wilderness is essentially unhindered and free from modern human control or manipulation.
- Naturalness. The wilderness ecological systems are substantially free from the effects of modern civilization.
- Undeveloped. The wilderness is essentially without permanent improvements or modern human occupation.
- Outstanding opportunities for solitude or a primitive and unconfined type of recreation. The wilderness provides outstanding opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge.
- Other features of value. The wilderness may contain ecological, geological, or other features of scientific educational, scenic, or historical value.

wilderness characteristics Undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation and other features and values.

wilderness inventory area An area determined through the wilderness inventory process in Forest Service Handbook 1909.12 chapter 70 that identifies lands that may be suitable for inclusion in the National Wilderness Preservation System. Lands included in the wilderness inventory were carried forward for evaluation.

wildland fire A non-structure fire, other than prescribed fire, that occurs in the wildland. Any fire originating from an unplanned ignition.

wildland-urban interface Defined by the Healthy Forests Restoration Act § 101 as follows:

- 1) an area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan; or
- 2) in the case of any area for which a community wildfire protection plan is not in effect—
 - a) an area extending 1/2-mile from the boundary of an at-risk community;
 - b) an area within 1 1/2 miles of the boundary of an at-risk community, including any land that—

- i) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community;
 - ii) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or
 - iii) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; and
- c) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuel reduction to provide safer evacuation from the at-risk community.

The Flathead County Community Wildfire Protection Plan (Suenram, 2011) includes the wildland-urban interface map, accessed at <https://flathead.mt.gov/fireservice/documents/FlatheadCWPP2011.pdf>.

wind-dominated fire A state in which the power of the wind is greater than the power of the fire in influencing the behavior of the fire.

windthrow A tree or stand of trees that has been blown over by the wind.

winter habitat The portion of the overall area inhabited by an ungulate species where the majority of individuals are found from the first heavy snowfall to spring green-up or during a site-specific period of winter. In the Rocky Mountains, winter habitats for ungulates have a relatively low amount of snow cover.

yarding The operation of hauling trees from their stump (once cut down) to a collecting point.

zone 1 An area surrounding the grizzly bear primary conservation area in the Northern Continental Divide Ecosystem where the intent is to maintain occupancy by grizzly bears but at expected lower densities than inside the primary conservation area. Zone 1 also includes two demographic connectivity areas (Salish and Ninemile). [NCDE]

zone 2 An area adjacent to the grizzly bear zone 1 and/or zone 3 in the Northern Continental Divide Ecosystem where grizzly bears, particularly males, would have the opportunity to move between the Northern Continental Divide Ecosystem and adjacent ecosystems. The intent of the zone 2 area is to allow for resource management and recreational opportunities while responding to grizzly bear-human conflicts with appropriate management actions. [NCDE]

zone 3 The area that primarily consists of areas where grizzly bears do not have enough suitable habitat to support population growth. Grizzly bear occupancy will not be actively discouraged in zone 3, and the management emphasis will be on conflict response. [NCDE]

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