USDA United States Department of Agriculture

Lassen National Forest Over-snow Vehicle Use Designation

Revised Final Environmental Impact Statement

Volume II. Chapter 3 (Wildlife through Fisheries and Aquatics), Chapter 4, References, Index, and Appendices

Forest Service Lassen National Forest March 2018

Cover photo: Jonohey

Lassen National Forest Over-snow Vehicle Use Designation

Revised Final Environmental Impact Statement

Lassen National Forest

Lassen, Shasta, Tehama, Butte, Plumas, Siskiyou, and Modoc Counties, California

Lead Agency:	**USDA Forest Service**
Responsible Official:	**TED MCARTHUR, ACTING FOREST SUPERVISOR** **Lassen National Forest** **2550 Riverside Drive** **Susanville, CA 96130**
For Information Contact:	**CHRISTOPHER O'BRIEN, PUBLIC SERVICES AND ECOSYSTEMS STAFF OFFICER** **Lassen National Forest** **2550 Riverside Drive** **Susanville, CA 96130** **Phone: (530) 257-2151**

Abstract: The Forest Service proposes to designate snow trails and areas for public over-snow vehicle (OSV) use on the Lassen National Forest. These designations would occur on National Forest System (NFS) snow trails and areas on NFS lands within the Lassen National Forest. The Forest Service would also identify snow trails where grooming for public OSV use would occur within the Lassen National Forest.

Consistent with the Forest Service's Travel Management Regulations at 36 CFR Part 212 Subpart C, trails and areas designated for public over-snow vehicle use would be displayed on a publicly available over-snow vehicle use map (OSVUM). Public over-snow vehicle use off designated trails and outside designated areas is prohibited by 36 CFR §261.14.

This Revised Final Environmental Impact Statement (RFEIS) discloses the comparative analysis of the options being considered in designating snow trails and areas of the Lassen National Forest for OSV use. We consider the environmental impacts of a proposed action, a no-action alternative, and three additional action alternatives developed in response to issues. A Notice of Intent to prepare an EIS was published in the Federal Register on June 26, 2015. A final EIS and draft record of decision were released in August of 2016 and "Legal Notice of Opportunity to Object" was published in the Lassen County Times on August 23, 2016. That legal notice signified the beginning of a 45-day objection period which began on August 24, 2016. After considering the objections received, the Forest Service determined it would be necessary to revise the analysis, starting with a Revised Draft Environmental Impact Statement (RDEIS).

After reviewing comments on the RDEIS, we prepared this Revised Final Environmental Impact Statement (RFEIS) and included further revisions. This RFEIS and the associated draft decision document (Record of Decision) is subject to the pre-decisional administrative review process (objection process) pursuant to 36 CFR 218, Subparts A and B. Objections will only be accepted from those who have previously submitted specific written comments regarding this proposed project during scoping or other designated opportunity for public comment in accordance with §218.5(a). Issues raised in objections must be based on previously submitted, timely, specifically written comments regarding this proposed project unless based on new information arising after the designated comment opportunities.

Lassen National Forest Over-snow Vehicle Use Designation

Revised Final Environmental Impact Statement

Volume II. Chapter 3 (continued), Chapter 4, References, Index, and Appendices

Contents

Volume II Tables

Volume II Figures

Listed and Sensitive Wildlife Species

Introduction

A biological evaluation for the Lassen National Forest Over-snow Vehicle (OSV) Use Designation Project has been prepared in accordance with the Endangered Species Act of 1973, as amended, and follows policy established in Forest Service Manual Direction (FSM 2670) for Threatened, Endangered, Proposed, Candidate, and Sensitive (TEPCS) wildlife species. Species considered for analysis are shown in table 139 and table 140 (pages 429 and 430). Potential effects of OSV use and trail grooming, including associated actions, to Region 5 terrestrial TEPCS wildlife species and terrestrial wildlife species of public interest are disclosed and analyzed. Referenced maps are included in a separate map packet to accompany this analysis. Special-status aquatic and plant species, management indicator species, survey and manage species, and Neotropical migratory landbirds are analyzed in separate reports (please refer to the project record).

Project Location

This proposal would be implemented on all of the National Forest System (NFS) lands within the Lassen National Forest in northeastern California (figure 1 in volume I). However, not all NFS trails and areas on these NFS lands would be designated for public OSV use.

Relevant Laws, Regulations, and Policy (Applies to All Alternatives)

Regulatory Framework

Land and Resource Management Plan

The Lassen National Forest Land and Resource Management Plan (USDA Forest Service 1992; LRMP), as amended (USDA Forest Service 1994, 2004) provides management direction. Although amendments to the LRMP have modified management direction for northern goshawk, California spotted owl, marten, and Sierra Nevada red fox, the following LRMP direction remains relevant to all species under consideration for this project:

Desired Future Condition

Biological diversity remains high with viable populations of all native wildlife and plant species maintained.

Forest Goals

Manage habitat for sensitive wildlife species to insure that these species do not become threatened or endangered due to Forest Service actions.

Forest Standards and Guidelines

Manage habitat for sensitive wildlife species to insure that these species do not become threatened or endangered due to Forest Service actions

(1) Management activities within habitat occupied by sensitive species, or where potential habitat exists, will not be permitted unless supported by a biological evaluation

Management Area

OSV-related Management Area Direction

Lassen National Forest LRMP contains no management area direction specific to OSVs. However, it does prohibit motorized vehicles within the Blacks Mountain and Cub Creek Research Natural Areas (RNAs) in the Ebey Management Area and in some other areas including designated Wilderness.

Other Relevant Management Area Direction

Appendix T: Furbearer Management

The management objective for marten and fisher is to maintain and enhance their populations where possible, to insure they do not become federally listed as threatened or endangered suitable, marten and fisher habitat was identified based on the latest scientific knowledge at that time. Habitat management areas were established using the guidelines in Appendix T to (1) determine approximate locations of territories; (2) determine the effects of these territories on timber management objectives and; (3) develop recommendations for marten and fisher habitat distribution on the forest. On the forest, 93,900 acres were identified as marten and fisher habitat management areas; this includes home range and travel corridors. Using the Appendix T methodology, marten and fisher habitat is managed under a no scheduled harvest prescription.

Sierra Nevada Forest Plan Amendment

Lassen National Forest Land and Resource Management Direction (USDA Forest Service 1992): The Lassen Forest Plan, as amended by the Northwest Forest Plan and Sierra Nevada Forest Plan Amendment (USDA Forest Service 2001, 2004).

Management Goals and Strategies

Old Forest Ecosystems and Associated Species

Goals: The broad goals of the old forest and associated species conservation strategy are to:

- Protect, increase, and perpetuate desired conditions of old forest ecosystems and conserve species associated with these ecosystems while meeting people's needs for commodities and outdoor recreation activities;
- Increase the frequency of large trees, increase structural diversity of vegetation, and improve the continuity and distribution of old forests across the landscape; and
- Restore forest species composition and structure following large-scale, stand-replacing disturbance events.

Strategy: The old forest ecosystem strategy has the following key elements:

- A network of land allocations, including California spotted owl and northern goshawk protected activity centers (PACs), California spotted owl home range core areas, forest carnivore den sites, and the southern Sierra fisher conservation area, with management direction specifically aimed at sustaining viable populations of at-risk species associated with old forest ecosystems well distributed across Sierra Nevada national forests;
- A network of old forest emphasis areas managed to maintain or develop old forest habitat in areas containing the best remaining large blocks or landscape concentrations of old forest and areas that provide old forest functions (such as connectivity of habitat over a range of elevations to allow migration of wide-ranging old-forest-associated species);

- Direction for restoring ecosystems across all land allocations following large-scale catastrophic disturbance events; and
- A proactive approach for improving forest health with management objectives to reduce susceptibility of forest stands to insect and drought-related tree mortality by managing stand density levels.

Land Allocations and Desired Conditions

California Spotted Owl Protected Activity Centers

Designation

California spotted owl PACs are delineated surrounding each territorial owl activity center detected on NFS lands since 1986. Owl activity centers are designated for all territorial owls based on: (1) the most recent documented nest site, (2) the most recent known roost site when a nest location remains unknown, and (3) a central point based on repeated daytime detections when neither nest nor roost locations are known.

PACs are delineated to: (1) include known and suspected nest stands and (2) encompass the best available 300 acres of habitat in as compact a unit as possible. The best available habitat is selected for California spotted owl PACs to include: (1) two or more tree canopy layers; (2) trees in the dominant and co-dominant crown classes averaging 24 inches diameter at breast height (dbh) or greater; (3) at least 70 percent tree canopy cover (including hardwoods); and (4) in descending order of priority, California wildlife habitat relationships (CWHR) classes 6, 5D, 5M, 4D, and 4M and other stands with at least 50 percent canopy cover (including hardwoods). Aerial photography interpretation and field verification are used as needed to delineate PACs.

As additional nest location and habitat data become available, boundaries of PACs are reviewed and adjusted as necessary to better include known and suspected nest stands and encompass the best available 300 acres of habitat.

When activities are planned adjacent to lands of other ownership, available databases are checked for the presence of nearby California spotted owl activity centers. A 300-acre circular area, centered on the activity center, is delineated, and any part of the area that lies on NFS lands is designated and managed as a California spotted owl PAC.

PACs are maintained regardless of California spotted owl occupancy status. However, after a stand-replacing event, habitat conditions are evaluated within a 1.5-mile radius around the activity center to identify opportunities for re-mapping the PAC. If there is insufficient suitable habitat for designating a PAC within the 1.5-mile radius, the PAC may be removed from the network.

Desired Conditions

Stands in each PAC have: (1) at least two tree canopy layers; (2) dominant and co-dominant trees with average diameters of at least 24 inches dbh; (3) at least 60 to 70 percent canopy cover; (4) some very large snags (greater than 45 inches dbh.); and (5) snag and down woody material levels that are higher than average.

Management Intent

Maintain PACs so they continue to provide habitat conditions that support successful reproduction of California spotted owls.

Northern Goshawk Protected Activity Centers

Designation

Northern goshawk (PACs are delineated surrounding all known and newly discovered breeding territories detected on NFS lands. Northern goshawk PACs are designated based upon the latest documented nest site and location(s) of alternate nests. If the actual nest site is not located, the PAC is designated based on the location of territorial adult birds or recently fledged juvenile goshawks during the fledgling dependency period.

PACs are delineated to: (1) include known and suspected nest stands and (2) encompass the best available 200 acres of forested habitat in the largest contiguous patches possible, based on aerial photography. Where suitable nesting habitat occurs in small patches, PACs are defined as multiple blocks in the largest best available patches within 0.5 mile of one another. Best available forested stands for PACs have the following characteristics: (1) trees in the dominant and co-dominant crown classes average 24 inches dbh. or greater; (2) in west side conifer and east side mixed conifer forest types, stands have at least 70 percent tree canopy cover; and (3) in east side pine forest types, stands have at least 60 percent tree canopy cover. Non-forest vegetation (such as brush and meadows) should not be counted as part of the 200 acres.

As additional nest location and habitat data become available, PAC boundaries are reviewed and adjusted as necessary to better include known and suspected nest stands and to encompass the best available 200 acres of forested habitat.

When activities are planned adjacent to lands of other ownership, available databases are checked for the presence of nearby northern goshawk activity centers. A 200-acre circular area, centered on the activity center, is delineated. Any part of the circular 200-acre area that lies on NFS lands is designated and managed as a northern goshawk PAC.

PACs are maintained regardless of northern goshawk occupancy status. PACs may be removed from the network after a stand-replacing event if the habitat has been rendered unsuitable as a northern goshawk PAC and there are no opportunities for re-mapping the PAC near the affected PAC.

Desired Conditions

Stands in each PAC have: (1) at least two tree canopy layers; (2) dominant and co-dominant trees with average diameters of at least 24 inches dbh; (3) at least 60 to 70 percent canopy cover; (4) some very large snags (greater than 45 inches dbh); and (5) snag and down woody material levels that are higher than average.

Management Intent

Maintain PACs so they continue to provide habitat conditions that support successful reproduction of northern goshawks.

Great Gray Owl Protected Activity Centers

Designation

PACs are established and maintained to include the forested area and adjacent meadow around all known great gray owl nest stands. The PAC encompasses at least 50 acres of the highest quality nesting habitat (CWHR types 6, 5D, and 5M) available in the forested area surrounding the nest. The PAC also includes the meadow or meadow complex that supports the prey base for nesting owls.

Desired Conditions

Meadow vegetation in great gray owl PACs supports a sufficiently large meadow vole population to provide a food source for great gray owls through the reproductive period.

Forest Carnivore Den Site Buffers

Designation

Fisher den sites are 700-acre buffers consisting of the highest quality habitat (CWHR size class 4 or greater and canopy cover greater than 60 percent) in a compact arrangement surrounding verified fisher birthing and kit-rearing dens in the largest, most contiguous blocks available.

Marten den sites are 100-acre buffers consisting of the highest quality habitat in a compact arrangement surrounding the den site. CWHR types 6, 5D, 5M, 4D, and 4M in descending order of priority, based on availability, provide highest quality habitat for the marten.

Desired Conditions

Areas surrounding marten den sites have (1) at least two conifers per acre greater than 24 inches dbh with suitable denning cavities, (2) canopy closures exceeding 60 percent, (3) more than 10 tons per acre of coarse woody debris in decay classes 1 and 2, and (4) an average of 6 snags per acre on the west side and 3 per acre on the east side.

California Spotted Owl Home Range Core Areas

Designation

A home range core area is established surrounding each territorial spotted owl activity center detected after 1986. The core area amounts to 20 percent of the area described by the sum of the average breeding pair home range plus one standard error. Home range core area sizes are 1,000 acres on the Almanor Ranger District and 2,400 acres on the Hat Creek and Eagle Lake Ranger Districts.

Aerial photography is used to delineate the core area. Acreage for the entire core area is identified on NFS lands. Core areas encompass the best available California spotted owl habitat nearest the owl activity center. The best available contiguous habitat is selected to incorporate, in descending order of priority, CWHR classes 6, 5D, 5M, 4D and 4M, and other stands with at least 50 percent tree canopy cover (including hardwoods). The acreage in the 300-acre PAC counts toward the total home range core area. Core areas are delineated within 1.5 miles of the activity center.

When activities are planned adjacent to lands of other ownership, circular core areas are delineated around California spotted owl activity centers. Using the best available habitat as described above, any part of the circular core area that lies on NFS lands is designated and managed as a California spotted owl home range core area.

Desired Conditions

Home range core areas consist of large habitat blocks that have: (1) at least two tree canopy layers; (2) at least 24 inches dbh in dominant and co-dominant trees; (3) a number of very large (greater than 45 inches dbh) old trees; (4) at least 50 to 70 percent canopy cover; and (5) higher than average levels of snags and down woody material.

Forestwide Standards and Guidelines

The following standards and guidelines applicable to terrestrial biota will be considered during the analysis process. Standards and guidelines described in this section apply to all land allocations, other than Wilderness and wild and scenic river areas, unless stated otherwise.

Habitat Connectivity for Old Forest Associated Species

27. Minimize old forest habitat fragmentation. Assess potential impacts of fragmentation on old forest associated species (marten) in biological evaluations.

28. Assess the potential impact of projects on the connectivity of habitat for old forest-associated species.

29. Consider retaining forested linkages (with canopy cover greater than 40 percent) that are interconnected via riparian areas and ridge top saddles during project-level analysis.

30. If fishers are detected outside the southern Sierra fisher conservation area, evaluate habitat conditions and implement appropriate mitigations to retain suitable habitat within the estimated home range. Institute project-level surveys over the appropriate area, as determined by an interdisciplinary team.

Wolverine and Sierra Nevada Red Fox Detections

32. Detection of a wolverine or Sierra Nevada red fox will be validated by a forest carnivore specialist. When verified sightings occur, conduct an analysis to determine if activities within 5 miles of the detection have a potential to affect the species. If necessary, apply a limited operating period from January 1 to June 30 to avoid adverse impacts to potential breeding. Evaluate activities for a 2-year period for detections not associated with a den site. Limited operating periods for old forest-dependent species apply only to vegetation management activities.

Wheeled Vehicles

69. Prohibit wheeled-vehicle travel off of designated routes, trails, and limited off-highway vehicle (OHV) use areas. Unless otherwise restricted by current forest plans or other specific area standards and guidelines, cross-country travel by over-snow vehicles [OSVs] would continue.

Standards and Guidelines for California Spotted Owl and Northern Goshawk Protected Activity Centers

75. For California spotted owl PACs: Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately ¼ mile of the activity center during the breeding season (March 1 through August 31[1]), unless surveys confirm that California spotted owls are not nesting. Prior to implementing activities within or adjacent to a California spotted owl PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center. Limited operating periods for old forest-dependent species apply only to vegetation management activities.

76. For northern goshawk PACs: Maintain an LOP, prohibiting vegetation treatments within approximately ¼ mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand within a (PAC is unknown, either apply the LOP to a ¼-mile area surrounding the PAC, or survey to determine the

[1] Changed to August 15th by Region 5 Regional Forester direction issued November 16, 2006.

nest stand location. Limited operating periods for old forest-dependent species apply only to vegetation management activities.

77. The LOP may be waived for vegetation treatments of limited scope and duration, when a biological evaluation determines that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing and specific location. Where a biological evaluation concludes that a nest site would be shielded from planned activities by topographic features that would minimize disturbance, the LOP buffer distance may be modified.

82. Mitigate impacts where there is documented evidence of disturbance to the nest site from existing recreation, off-highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off-highway vehicle routes, and recreational and other developments for their potential to disturb nest sites.

Standards and Guidelines for Great Gray Owl Protected Activity Centers

83. Apply a limited operating period, prohibiting vegetation treatments and road construction within ¼ mile of an active great gray owl nest stand, during the nesting period (typically March 1 to August 15). The LOP may be waived for vegetation treatments of limited scope and duration, when a biological evaluation determines that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing and specific location. Where a biological evaluation concludes that a nest site would be shielded from planned activities by topographic features that would minimize disturbance, the LOP buffer distance may be reduced.

Standards and Guidelines for Fisher and Marten Den Sites

85. Protect fisher den site buffers from disturbance with an LOP from March 1 through June 30 for vegetation treatments as long as habitat remains suitable or until another regionally approved management strategy is implemented. The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location.

87 and 89. Mitigate impacts where there is documented evidence of disturbance to the den site from existing recreation, off-highway vehicle route, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off-highway vehicle routes, and recreational and other developments for their potential to disturb den sites.

88. Protect marten den site buffers from disturbance from vegetation treatments with an LOP from May 1 through July 31, as long as habitat remains suitable or until another regionally approved management strategy is implemented. The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. Limited operating periods for old forest-dependent species apply only to vegetation management activities.

Federal Law

Endangered Species Act

The Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) requires that any action authorized by a Federal agency not be likely to jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse modification of critical habitat for these species. Section 7 of the Endangered Species Act, as amended, requires the responsible Federal agency to consult the Fish and Wildlife Service and the National Marine Fisheries Service concerning any

project or action that may affect a threatened or endangered species under their jurisdiction. It is Forest Service policy to analyze impacts to threatened or endangered species to ensure management activities are not likely to jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse modification of critical habitat for these species. This assessment is documented in a biological assessment (project record).

Bald Eagle Protection Act of 1940

The Bald Eagle Protection Act of 1940 provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the act or regulations issued pursuant thereto and strengthened other enforcement measures. The act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." Disturb means to agitate or bother a bald or golden eagle to a degree that causes, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior (USDI Fish and Wildlife Service 2007).

Other Guidance or Recommendations

Forest Service Manual (FSM) 2600 – Wildlife, Fish, and Sensitive Plant Habitat Management

Chapter 2670 – Threatened, Endangered and Sensitive Plants and Animals

2670.22 – Objectives for Sensitive Species: Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands.

2670.32 – Policy for Sensitive Species: Review programs and activities as part of the National Environmental Policy Act of 1969 process through a biological evaluation, to determine their potential effect on sensitive species. Avoid or minimize impacts to species whose viability has been identified as a concern. Analyze, if impacts cannot be avoided, the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole.

2672.4 – Biological Evaluations: Review all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened, proposed, or sensitive species. The biological evaluation is the means of conducting the review and of documenting the findings. Document the findings of the biological evaluation in the decision notice.

2672.41 – Objectives of the Biological Evaluation:

1. To ensure that Forest Service actions do not contribute to loss of viability of any native or desired non-native plant or contribute to animal species or trends toward Federal listing of any species.

3. To provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision-making process.

2672.42 – Standards for Biological Evaluations

Biological evaluations shall include the following:

1. An identification of all listed, proposed, and sensitive species known or expected to be in the project area or that the project potentially affects. Contact the Fish and Wildlife Service ([US]FWS) or the National Marine Fisheries Service (NMFS) as part of the informal consultation process for a list of endangered, threatened, or proposed species that may be present in the project area.

2. An identification and description of all occupied and unoccupied habitat recognized as essential for listed or proposed species recovery, or to meet Forest Service objectives for sensitive species.

3. An analysis of the effects of the proposed action on species or their occupied habitat or on any unoccupied habitat required for recovery.

4. A discussion of cumulative effects resulting from the planned project in relationship to existing conditions and other related projects.

5. A determination of no effect, beneficial effect, or "may" effect on the species and the process and rationale for the determination, documented in the environmental assessment or the environmental impact statement.

6. Recommendations for removing, avoiding, or compensating for any adverse effects.

7. A reference of any informal consultation with the Fish and Wildlife Service as well as a list of contacts, contributors, sources of data, and literature references used in developing the biological evaluation.

Topics and Issues Addressed in This Analysis

Issues

The public identified several non-significant issues during scoping. Designating trails and areas for OSV use and grooming trails for OSV use could impact terrestrial wildlife through direct, indirect, or cumulative:

- Injury or mortality
- Disturbance to individuals (e.g., increased noise and human presence resulting in a loss of breeding and/or feeding)
- Impacts to wildlife habitats including
    - Habitat fragmentation or modification
    - Snow compaction in the habitat of species that hibernate, subnivean species habitat, or in or near denning sites.

Resource Indicators and Measures

The following resource indicators and measures (table 138) were used in the analysis to measure and disclose effects to TEPCS species and other species of public interest:

Table 138. Resource indicators and measures for assessing effects

Resource Element	Resource Indicator	Measure (Quantify if possible)	Used to address: P/N, or key issue?	Source
Federally Listed, Proposed Species Forest Service Sensitive Species	Potential for disturbance to individuals from noise associated with OSV use and related activities[2]	All species unless otherwise noted below: Acres and percentage of habitat with potential to be impacted by OSV use Acres and percentage of buffered Northern spotted owl (NSO), California spotted owl (CSO) activity centers and northern goshawk (NGO) PACs with potential to be impacted by OSV use Acres and percentage of buffered bald eagle nests with potential to be impacted by OSV use Species that Migrate or Hibernate: Qualitative discussion only	Yes	FSM 2672.4
Federally Listed, Proposed Species Forest Service Sensitive Species	Potential for injury or mortality of individuals from OSV use or related activities	All species unless otherwise noted below: Acres and percentage of habitat with potential to be impacted by OSV use Acres and percentage of buffered California spotted owl (CSO) activity centers and northern goshawk (NGO) PACs with potential to be impacted by OSV use Acres and percentage of buffered bald eagle nests with potential to be impacted by OSV use	Yes	FSM 2672.4
Applicable Federally Listed, Proposed Species Applicable Forest Service Sensitive Species (marten, Sierra Nevada red fox)	Potential for habitat fragmentation or modification	Acres and percentage of habitat with potential to be impacted by OSV use	Yes	FSM 2672.4
Marten	Potential for loss of habitat connectivity	Acres and percentage of connectivity corridors with potential to be impacted by OSV use	Yes	FSM 2672.4

[2] Related activities include snow plowing of roads, parking lots, and trailheads (i.e., staging areas)

Resource Element	Resource Indicator	Measure (Quantify if possible)	Used to address: P/N, or key issue?	Source
Applicable Forest Service Sensitive Species (willow flycatcher, western pond turtle, Shasta Hesperian snail, western bumble bee, bats)	Potential for habitat degradation	Qualitative discussion	Yes	FSM 2672.4
Applicable Federally Listed, Proposed Species, marten, and Sierra Nevada red fox	Potential for effects of snow compaction or snow compaction effects to foraging (marten) or denning (Sierra Nevada red fox) individuals	Acres and percentage of habitat with potential to be impacted by OSV use	Yes	FSM 2672.4
Subnivean Species (prey for Federally Listed and Proposed Species and Forest Service Sensitive Species)	Potential for effects of snow compaction by OSV use or related activities on subnivean species habitat	Acres and percentage of habitat with potential to be impacted by OSV use for applicable species (NSO, fisher, marten, CSO, Sierra Nevada red fox)	Yes	FSM 2672.4

Methodology

Species biology, habitat information, and potential for OSV-related effects, from the best available scientific information, were discussed in species account sections. Species occurrence information specific to the Lassen National Forest was disclosed. For quantitative assessment, the amount of suitable habitat with potential to be impacted by OSV use was used to measure effects to species for the purpose of comparison by alternative. Specific reproductive site information, when available, was also used to measure effects to species.

Analysis Process

Using Geographic Information Systems (GIS), modeled habitat and reproductive sites, when available, for each species was intersected with areas of moderate to high OSV use assumptions criteria (canopy cover less than 70 percent, slopes less than 21 percent; see below) and areas in which OSV use would be permitted under each alternative. The resulting total acres and percentages of habitat, by assumption and alternative, were disclosed and compared. Using best available scientific information, known reproductive sites were buffered [Northern spotted owl and California spotted owl activity center points (0.70 mile), goshawk PACS (0.25 mile), and bald eagle nest site points (660 feet)] to identify habitats with the greatest potential to be impacted by OSV use and associated activities.

Assumptions Specific to the Wildlife Resources Analysis

Snowmobile use patterns vary by day of the week, time of the day, topography, terrain, and vegetation. With assistance from Lassen National Forest staff, we developed the following use

patterns and categories to create a more accurate description of potential impacts of each alternative to species and habitats. Refer to the project record for mapped assumptions.

General OSV use patterns:

- Primarily day use (generally 10:00 am to 3:00 pm; grooming occurs at night).
- OSV use is highest on weekends and holidays.
- Highest concentrations of OSV use occur along groomed trails (this is supported by research documented in the California OSV Program Final EIR (2010)). Generally, groomed trails are used to access cross-country areas.
- Use is concentrated at trailheads.
- Higher use occurs in open meadows adjacent to groomed trail access and in flatter areas.
- OSV "high marking" occurs primarily on slopes with open vegetation, near groomed trails.
- Lower elevations generally have less OSV use – snow occurs at lower elevations less frequently and persists for short periods of time (2 to 5 days).
- Non-groomed trails receive 50 percent less use than groomed trails (only 25,000 registered OSVs in California per California OSV Program Final EIR (2010), most use on groomed trails; if OSV trail grooming were discontinued, assume that use would decline by 50 percent).
- OSV use is assumed to be very low (fewer than 10 riders per site per day on a weekend), depending on specific snow depths and daily temperatures, after the March 31 termination date closing roads for exclusive OSV use. Based on surveys of Forest Snow Parks and designated OSV trail access points, OSV use was documented until the end of April, at which point snow levels no longer allow continued use of designated OSV trails (California OSV Program Final EIR (2010)). Therefore, for the purpose of this analysis, April 30 is used as a cut-off date for the maximum period of interaction between snowmobiles and wildlife.

Areas of Moderate to High OSV Use:

- Canopy cover less than 70 percent: CWHR vegetation (California Department of Fish and Wildlife 2014) 1S, 1P, 1M, 2S, 2P, 2M, 3S, 3P, 3M, 4S, 4P
- Slope less than or equal to 20 percent

High Use:

- Areas within 0.5 mile of snowmobile staging areas
- Areas within 0.5 mile of groomed trails
- Meadows within 0.5 mile of a designated OSV trail

Moderate Use:

- Areas within 0.5 mile of marked (not groomed) OSV trails
- Areas between 0.5 and 1.5 miles from groomed trails
- Meadows 10 acres or greater in size, or 0.5 to 1.5 miles from an OSV trail

Areas of Low to No OSV Use:

Low Use:

- Areas where OSV use is prohibited or restricted under current management. Unauthorized uses will be addressed as law enforcement issues and may prompt corrective actions.
- Areas below 3,500 feet in elevation
- Canopy cover greater than 70 percent: CWHR vegetation 2D, 3D, 4D, 4M; vegetation size 5 and 6
- Slope 21 percent or greater
- Meadows 30 acres or greater, 1.5 miles or more from an OSV trail
- Areas more than 1.5 miles from a groomed OSV trail
- Areas more than 0.5 mile from a marked (not groomed) OSV trail

Potential Use:

- CWHR vegetation open areas (annual grass, barren, lacustrine, mixed chaparral, montane chaparral, perennial grass, sagebrush, wet meadow and urban).

Indirect Effects (Snow Compaction)

Potential indirect effects, including snow compaction and vehicle emissions, are likely to be concentrated in areas of moderate to high OSV use.

New Information:

Future studies or monitoring may identify new information or unexpected types or levels of impacts to terrestrial wildlife resources, and may prompt corrective actions as necessary.

Information and Data Sources

We used the best available scientific information with respect to terrestrial wildlife species information and data sources for this project, which include the following:

- California Department of Parks and Recreation (California OSV Program Final EIR (2010))
- Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement (USDA Forest Service 2001) and Record of Decision for Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004)
- Assessing the Cumulative Effects of Linear Recreation Routes on Wildlife Habitats on the Okanogan and Wenatchee National Forests. Gen. Tech. Rep. PNW-GTR-586 (Gaines et al. 2003)
- Species' literature
- Personal communications with researchers, Forest Service Regional Office staff and Lassen National Forest staff
- California Wildlife Habitat Relationships (2014)
- EVEG data
- Available Lassen National Forest GIS Data

- Natural Resources Management (NRM) Wildlife Data

Incomplete and Unavailable Information

OSV use is not consistent across all available habitat. Although we don't know specifically where impacts would occur at any given time and we cannot quantify the amount of impact from noise-based disturbance, the amount of impact contributing to snow compaction to the subnivean space, or the amount of impact on habitat connectivity, we know the potential for impacts would be greatest in areas of moderate to high OSV use and in high-use areas (see assumptions).

It is also unknown whether compacted trails resulting from snowmobile use are facilitating predator or competitor incursion into deep snow areas; if this is occurring, the extent to which it is occurring, as a result of OSV use and related activities on the Lassen National Forest, is unknown.

Climate change, when identified as a specific threat (marten) or stressor (Sierra Nevada red fox) to a species, is disclosed, by species. However, synergistic impacts of climate change with those of OSV use and related activities are largely unknown at this time.

Spatial and Temporal Context for Effects Analysis

Direct, Indirect, and Cumulative Effects Boundaries

The spatial boundaries for analyzing the direct, indirect, and cumulative effects to all of the species under consideration for analysis, including threatened, endangered, proposed, candidate, Forest Service sensitive species, and species of public interest is the Lassen National Forest boundary (unless otherwise specified) for the following reasons: the forest boundary is large enough to address wide-ranging species and Forest Service Sensitive Species' viability is assessed at the Forest Plan area. The temporal boundary for this analysis is 10 years from the signing of the decision document and is based on adequate time for an effectiveness monitoring program to be designed and implemented and for results to be assessed.

Appendix H of this RFEIS (Volume II) discloses how cumulative impacts were considered. The potential impacts of the alternatives would accumulate with the impacts of past, other present, and reasonably foreseeable future actions in both time and geographic space (FSH 1909.15, Sec. 15.2).). If the proposed action or alternatives being analyzed in this RFEIS would result in no direct or indirect impacts, there could be no cumulative impacts. If the direct and indirect impacts of the action would occur within a different context than the impacts of past, present, and reasonably foreseeable future actions, there would also be no potential for impacts to accumulate in time and geographic space.

Only those residual impacts from past actions that are of the same type, occur within the same geographic area, and have a cause-and-effect relationship with the direct and indirect impacts of the proposed action and the alternatives are considered relevant and useful for the cumulative impacts analysis; this analysis relies on current environmental conditions as a proxy for the impacts of past actions.

Cumulative impacts can only occur when the likely impacts resulting from the proposed action or alternatives overlap spatially and temporally with the likely impacts of reasonably foreseeable future actions (FSH 1909.15, Sec. 15.2). Present and reasonably foreseeable future actions are listed in Appendix H of this RFEIS (Volume II) and include routine maintenance throughout the project area on roads and in campgrounds; routine Forest Service use of mineral material sources in designated areas throughout the project area; routine noxious weed management (hand pulling/digging) along

forest roads throughout the project area; a wide range of recreational use, in all seasons, across the forest; ongoing maintenance and use of communication sites; personal use woodcutting throughout the project area; grazing on range allotments, primarily between June 1 and October 31, annually, although grazing occurs between April 16 and May 31 on several allotments. Current vegetation management activities include the following:

- Bald Fire Salvage and Restoration, including salvage, treatment of non-merchantable trees, removal of hazard trees along roads and trails, treatment of activity slash (approximately 14,000 acres), site preparation, and planting (approximately 12,000 acres);
- Jellico Fire and Salvage (formerly a part of Bald Fire Salvage; see above)
- Tamarack and Dutch Fire Salvaged (formerly Eiler Fire Salvage), including treating approximately 3,048 acres of area salvage (20 percent of NFS lands), 1,174 acres of roadside hazard trees (8 percent of NFS lands), 4,480 acres of fuels treatments (30 percent of NFS lands), reforesting 5,645 acres (38 percent of NFS lands) within the fire perimeter, and adding 2.4 miles of existing non-system roads into the Forest road system as Maintenance Level 2 roads;
- Castle Timber Sale;
- Lassen Day Fire Salvage of dead and/or dying trees within approximately 200 acres of the Day Fire area on the Lassen National Forest;
- Lost Timber Sale;
- Urfa Timber Sale; and
- Yellow Modified Contract Timber Sale

In addition, the Schedule of Proposed Actions includes the following:

- Storrie Aquatic Organism Passage (AOP) Project that is removing three road-stream crossing structures that are barriers to aquatic organism passage on the Almanor Ranger District and replacing them with new structures that allow aquatic organisms to pass above and below the road crossings and that are capable of passing a 100-year storm flow;
- Grizzly Restoration Project that would move Forest road 26N11 away from Scotts John Creek; increase forest resilience, decrease fuels, maintain/improve wildlife habitat through thinning and prescribed fire; and implement actions to support three research proposals on the Almanor Ranger District;
- Rust Resistant Sugar Pine Maintenance project on the Eagle Lake Ranger District, including forest vegetation improvements that would thin areas around proven rust resistant sugar pine trees to increase sustainability by reducing direct vegetative competition, wildfire risk, over-wintering habitat for cone boring insects, and squirrel access to crowns;
- Big Meadows Powerline Improvement Project that would authorize Pacific Gas and Electric to improve 12 power poles lying along the south shore of Lake Almanor;
- High Lakes Motorized Trail Re- routes and Staging Area Improvements Project that would re-route and reconstruct motorized trail segments, decommission the eliminated trail segments, restore or improve dispersed recreation areas within inventoried roadless area, and develop a staging area outside inventoried roadless area;

- Rocks Restoration Project that proposes fuels reduction, vegetation management, aspen and meadow habitat improvement, and reforestation of some moderate to high severity burned areas on the Almanor Ranger District;
- Moonlight Hand-Thinning Project that would hand-thin small trees and brush along designated Forest Service roads on the Eagle Lake Ranger District to reduce fuels;
- Big Lake Restoration Project that would include removal of encroaching conifers, protection of a spring complex, and pre-commercial thinning in plantations on the Hat Creek Ranger District;
- Halls Flat Windthrow Project that would salvage wind thrown trees, recover economic value and reduce fuel accumulation of material blown down in a wind event on approximately 2,000 acres on the Hat Creek Ranger District; and
- Plum Restoration Project that would encompass: surface fuels treatment for fire hazard reduction; thinning for ponderosa pine, silver sage, meadow and aspen enhancements; noxious weed treatments; and road improvements on the Hat Creek Ranger District.

Potential effects of the Lassen National Forest Over-snow Vehicle Use Designation project that are most likely to combine with past, present, or reasonably foreseeable future actions, include disturbance to individuals from OSV use and increased human presence; habitat fragmentation or modification that facilitate predation or competition for wide-ranging forest carnivores; loss of habitat connectivity for marten; and snow compaction effects on subnivean species habitat. OSV use, and associated activities, would not alter vegetative structure or composition of habitats. Past, present, and reasonably foreseeable future actions overlapping in time (mid-December through the end of April; refer to General OSV Use Patterns under the Assumptions Specific to the Wildlife Resources Analysis section above) and space with the Lassen National Forest Over-snow Vehicle Use Designation project, and with similar potential effects, include the following:

- Noise-based disturbance or disruption to individuals from routine maintenance of roads across the forest during the time of overlap between OSV use and wheeled vehicles; winter recreational use across the forest; personal use woodcutting throughout the project area during the time of overlap between OSV use and wheeled vehicles; and salvage and fuels reduction projects, along with associated actions, toward the beginning and end of the OSV season;
- Habitat fragmentation or modification that facilitate predation or competition for wide-ranging forest carnivores or loss of habitat connectivity for marten, during the time of overlap between OSV use and salvage and fuels reduction projects; or
- Snow compaction effects on subnivean species habitat during the time of overlap between OSV use and wheeled vehicle use or salvage and fuels reduction projects.

Based upon spatial data provided by the Lassen National Forest, the vegetation management or restoration projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. In addition, seasonal limited operating periods required for vegetation projects, for most sensitive species, would prevent disturbance to breeding individuals. Wheeled motorized vehicles may not be used off of authorized National Forest System roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014a). Therefore, there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1 and December 31), and disturbance or displacement from these activities would occur outside of the breeding season for all species, under all of the alternatives.

Affected Environment and Environmental Consequences

Species Considered in this Analysis

We obtained official species lists for the Lassen National Forest Over-snow Vehicle Use Designation Project on February 20, 2018, from the Klamath Falls, Sacramento, Yreka, and Nevada Field Offices of the U.S. Department of the Interior, Fish and Wildlife Service (USDI Fish and Wildlife Service 2018a, 2018b, 2018c, 2018d). The lists identify wildlife species to consider, because they may be present within the general area of the Lassen National Forest (table 139). Sensitive species applicable to the Lassen National Forest are identified in the Pacific Southwest Region list of sensitive animal species by forest (USDA Forest Service 2014b). Terrestrial sensitive species applicable to the project area are listed below in table 140.

Table 139. Terrestrial threatened, endangered, proposed, and candidate (TEPC) species and designated or proposed critical habitat considered within this analysis

Species Name	TEPC Status[3]	Project Area Within Species' Range	Detections in or Near the Project Area	Suitable Habitat Present	Species Addressed Further/Rationale
Giant garter snake (*Thamnophis gigas*)	FT	No	No	No	No Project area is outside the known distribution of this species
Sierra Nevada red fox (*Vulpes vulpes necator*), Sierra Nevada Distinct Population Segment	FC/FSS	Yes	Yes	Yes	Yes
Gray wolf (*Canis lupus*)	FE	Yes	Yes	Yes	Yes
California wolverine (*Gulo gulo luteus*)	FP/FSS	Yes	Tahoe NF (~150 – 200 miles)	Yes	Yes
Northern spotted owl (*Strix occidentalis caurina*)	FT	Yes	Yes	Yes	Yes
Northern spotted owl designated critical habitat	NA	NA	NA	Designated critical habitat present within the project area	See northern spotted owl section
Valley elderberry long-horned beetle (*Desmocerus californicus dimorphus*)	FT	No	No	Yes (within historical distribution)	No; Project area is outside the known distribution of this species

[3] FE = federally endangered; FT = federally listed as threatened; FP = Federal proposed for listing; FC = Federal candidate for listing; FSS = Forest Service sensitive. Sources: Official federally endangered, threatened, proposed, and candidate species list obtained on June 21, 2017, from the Klamath Falls, Sacramento, Yreka, and Nevada U.S. Fish and Wildlife Service (USFWS) Field Offices and USDA Forest Service, Pacific Southwest Region, Sensitive Animal Species by Forest, Updated October 10, 2014.

Species Name	TEPC Status[3]	Project Area Within Species' Range	Detections in or Near the Project Area	Suitable Habitat Present	Species Addressed Further/Rationale
Valley elderberry long-horned beetle designated critical habitat	NA	No	No	No	No; Project area is outside the designated critical habitat
Yellow-billed cuckoo (*Coccyzus americanus*)	FT	No	No	No	No Project area is outside the known distribution of this species
Yellow-billed cuckoo proposed critical habitat	NA	No	No	No	No; Project area is outside the proposed critical habitat

Table 140. Terrestrial Forest Service sensitive species considered in this analysis

Species Name	Project Area Within Species' Range	Detections in or Near the Project Area	Suitable Habitat Present	Species Addressed Further/Rationale
Mammals				
Fisher (*Pekania pennanti*)	Yes	Yes	Yes	Yes
Pacific marten (*Martes caurina*)	Yes	Yes	Yes	Yes
Fringed myotis (*Myotis thysanodes*)	Yes	Yes	Yes	Yes
Pallid bat (*Antrozous pallidus*)	Yes	Yes	Yes	Yes
Townsend's big-eared bat (*Corynorhinus townsendii*)	Yes	Yes	Yes	Yes
Birds				
Bald eagle (*Haliaeetus leucocephalus*)	Yes	Yes	Yes	Yes
California spotted owl (*Strix occidentalis occidentalis*)	Yes	Yes	Yes	Yes
Great gray owl (*Strix nebulosa*)	Yes	Near	Yes	Yes
Greater Sandhill crane (*Grus canadensis tabida*)	Yes	Yes	Yes	Yes
Northern goshawk (*Accipiter gentilis*)	Yes	Yes	Yes	Yes
Willow flycatcher (*Empidonax traillii*)	Yes	Yes	Yes	Yes
Yellow rail (*Coturnicops noveboracensis*)	Yes	Yes	Yes	Yes
Reptiles				
Western pond turtle (*Emys marmorata*)	Yes	Yes	Yes	Yes
Invertebrates				
Shasta Hesperian snail (*Vespericola shasta*)	Yes	Yes	Yes	Yes
Western bumble bee (*Bombus occidentalis*)	Yes	Yes	Yes	Yes

Species Not Analyzed in Detail

Valley elderberry longhorn beetle

The valley elderberry longhorn beetle originally occurred in elderberry thickets in moist valley oak woodland along the margins of the Central Valley in California (USDI Fish and Wildlife Service 1984). The habitat of this insect has now largely disappeared throughout much of its former range due to agricultural conversion, levee construction, and stream channelization. Remnant populations are found in the few remaining natural woodlands and in some State and county parks. Critical habitat has been designated in Sacramento County along the American River in the City of Sacramento and along the American River Parkway.

The analysis area falls within the historical range of this species and potential suitable habitat occurs below 3,000 feet in elevation along the foothills in the southwestern portion of the forest (watersheds of Antelope, Deer, Mill and Butte Creeks, Tehama, and Butte Counties). Other riparian zones below 3,000 feet in elevation are within the Pitt River watershed around Lake Britton, Shasta County. However, review of USFWS species location information (USDI Fish and Wildlife Service 2014b) shows that lands administered by the Lassen National Forest (i.e., project area) occur outside the distribution of the nearest presumed extant species occurrences (i.e., southern and western Butte County; south-central and central Tehama County).

This species is known to use riparian habitats. Emissions from OSVs, particularly two-stroke engines on snowmobiles, release pollutants like ammonium, sulfate, benzene, PAHs and other toxic compounds that are stored in the snowpack; during spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding waterbodies (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the project hydrology report (project record) for additional information). However, the minimum cross-country snow depth of 12 inches under alternatives 2, 3, and 5 is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). Under alternatives 1and 4, the minimum cross-country snow depth would be the depth necessary to avoid resource damage. Due to the project area being outside the range of the species, and due to a lack of downstream effects from project activities, all alternatives would have no effect on the valley elderberry longhorn beetle or its designated critical habitat.

Western yellow-billed cuckoo

This is an uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations in California (CDFW 1999). Along the Colorado River, breeding population on the California side was estimated at 180 pairs in 1977. Additional pairs reside in the Sacramento and other riverine habitats found in Southern California. Formerly, the species was much more common and widespread throughout lowland California, but numbers were drastically reduced by habitat loss and current population estimations show about 50 pairs existing in California.

There are no known occurrences of this species found on the Lassen National Forest. In addition, cuckoos are migratory and are not expected to be in the general vicinity of the project area when snow is on the ground. Proposed critical habitat is located more than 10 miles from the project area.

Yellow-billed cuckoos use riparian environments during the breeding season. Emissions from OSVs, particularly two-stroke engines on snowmobiles, release pollutants like ammonium, sulfate, benzene, PAHs, and other toxic compounds that are stored in the snowpack; during spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding waterbodies (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the project hydrology report

(project record) for additional information). However, the minimum cross-country snow depth of 12 inches for alternatives 2, 3, and 5, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage. Due to the project area being outside the range of the species, and due to a lack of downstream effects from project activities, all alternatives would have **no effect** on yellow-billed cuckoo or its proposed critical habitat.

Giant garter snake (Thamnophis gigas)

The giant garter snake inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley (USDI Fish and Wildlife Service 2009). Because of the direct loss of natural habitat, the giant garter snake relies heavily on rice fields in the Sacramento Valley, as well as, managed marsh areas in Federal and State refuge areas. Giant garter snakes are typically absent from larger rivers because of lack of suitable habitat and emergent vegetative cover, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations. Possible suitable habitats occur downstream from the Lassen National Forest and outside the project area. Because the project area is outside the range of the species, and due to the lack of downstream effects from project activities, all alternatives would have no effect on the giant garter snake.

Species Analyzed in Detail

General Direct and Indirect Effects by Action

According to Gaines et al. (2003), the interactions between snowmobile trails and focal wildlife species are poorly documented for many species and these interactions need to be further refined with additional research and monitoring. The most common interactions between snowmobile trails and wildlife that Gaines et al. (2003) documented from the literature included trapping as facilitated by winter human access, disturbance-based displacement and avoidance,[4] and disturbance at a specific site,[5] usually wintering areas. To a lesser degree, hunting, trapping, poaching, collection, and habitat loss and fragmentation[6] were other interactions identified. Specific types of habitat modification that occurred on winter recreation trails include the effect of snow compaction[7] on the subnivean sites used by small mammals and alteration of competitor/predator communities.[8] The same types of responses would be expected off of designated trails (i.e., cross-country). Other interactions facilitated by linear recreation trails in general, but not specific to OSV use, include vehicle collision and physiological response.[9]

Trapping

Trapping of fisher, marten, wolf, wolverine, or any of the special-status species under consideration is not legal in California. Poaching and collecting without a valid permit are also illegal activities.

[4] Spatial shifts in populations or individual animals away from human activities on or near roads, trails, or networks.
[5] Displacement of individual animals from a specific location that is being used for reproduction and rearing of young.
[6] Loss and resulting fragmentation of habitat owing modification to the establishment of roads, trails, or networks, and associated human activities.
[7] Direct mortality of animals suffocated as a result of snow compaction from snowmobile routes or groomed ski trails or alteration of movement.
[8] A physical human-induced change in the environment that provides access for competitors or predators that would not have existed otherwise.
[9] Increase in heart rate or stress hormones when near a road or trail or network of roads or trails.

These types of activities, facilitated by OSV use, are expected to be rare and addressed as a law enforcement issue. Therefore, they will not be examined in this analysis.

Disturbance

Breeding Disruption

This type of disruption could impact late-successional species or wide-ranging carnivores. If the winter season overlaps with the beginning of breeding, the presence of OSVs or grooming equipment could disrupt courtship and nesting or denning activities due to noise and/or visual disturbance that result in behavioral changes in the animals.

Winter Range and/or Home Range Use

This type of impact could affect late-successional species or wide-ranging carnivores. Noise and extended human presence from OSV activities could reduce the size of the winter home range for several wildlife species. The home range provides food, shelter, and breeding opportunity, and if it is reduced, could compromise species survival, particularly during stressful survival conditions in the winter.

Many of the species that may be active or present during the OSV program season are nocturnal and may not be affected by daytime snowmobile activities. However, 29 percent of snowmobilers report some nighttime riding (California OSV Program Final EIR (2010)), and resulting human disturbance could disrupt home range use by nocturnal species. Trail grooming activities occur at night and are infrequent, and the grooming equipment moves slowly enough that grooming is not expected to have a substantial negative effect on wildlife home range. For nocturnal and crepuscular (most active at sunrise and sunset) species, trail grooming and OSV use may also result in animals avoiding areas frequented by OSV recreationists and groomers.

Physiological Response

Single or repeated interactions between OSVs and wildlife could lead to energy expenditures from flight or vigilance reactions. The energetic cost of flight can be significant for predatory animals. Quantifying these physiological responses in wildlife is extremely difficult.

The grooming equipment operates infrequently and moves slowly, so it is estimated that it results in fewer flight or vigilance reactions. Grooming is not expected to have a substantial negative effect on wildlife populations as a result of physiological stress. OSV use likely results in more flight or vigilance reactions because there are more vehicles, they move faster, and they are generally louder than grooming equipment. Physiological stress may impact individuals, but not populations as a whole.

Vehicle Collision

As previously discussed, the likelihood of a collision between snow grooming equipment and wildlife is extremely low because the equipment travels slowly (3 to 6 mph). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds. This effect would be most specific to mammals. Vehicle collision would be expected to be rare and would impact individuals rather than populations as a whole.

Habitat Modification

Trails as Routes for Competitors and Predators

Packed trails resulting from snowmobile use facilitate coyote incursion into deep snow areas (Bunnell et al. 2006) and can negatively impact marten, Sierra Nevada red fox, fisher, or other mammal populations through increased competition and predation. A study in Utah found that

90 percent of coyote movement was made within 1,150 feet of packed trails (Bunnell et al. 2006). It is unknown if this is occurring or the extent to which it is occurring, as a result of OSV use and related activities on the Lassen National Forest.

Competition and predation, if occurring, would be predictably restricted to areas in the immediate vicinity of trails. The use of OSV trails and regular grooming is an existing condition that has been in operation for numerous years; and no new trail expansion is proposed at this time. Therefore, coyote incursion, if occurring, would continue, but would not increase in size of area as a result of OSV program activities.

Pacific Crest Trail Crossing Features

The addition of designated trails for OSVs to cross the PCT is proposed under all action alternatives. These features are not expected to add measureable impacts beyond those identified within the analyses for individual species.

Avoidance

For diurnal species, OSV use of the trails may result in animals avoiding areas used by OSV recreationists.

Snow Compaction

Mechanical snow compaction can suffocate or alter the movements of subnivean fauna (small mammals, such as shrews, voles, pocket gophers, and mice that remain active throughout the winter with much of their activity occurring in the subnivean space beneath the snowpack) and small mammals that den under the snow, such as marten. Snow compaction may impact individuals. However, small mammals' population densities are dependent on numerous factors.

Threatened, Endangered, and Proposed Species, and Critical Habitat

Northern Spotted Owl (*Strix occidentalis caurina*)

Threatened

Species Account

On the Lassen, northern spotted owls (NSO) are surveyed and monitored, as needed, on the Hat Creek Ranger District. Surveys are usually associated with forest management practices to determine whether there is a need to implement limited operating periods or other mitigations. Table 141 shows observation data for the NSO on the Lassen National Forest. NSOs were observed as single individuals until 2009. No reproduction has been observed. Observations occurred over multiple years at three sites: Screwdriver Creek, Poison Creek, and Underground Creek. The sites are within 1.5 miles of each other. These detections were made during different years. In 1989, a male was detected in the Poison Creek drainage. A single male was detected in 1991, adjacent to Screwdriver Creek. A male was detected in the headwaters of Poison Creek during 1992. A female was detected in the headwaters of Underground Creek during 1995 and 1996. Inventory work did not detect spotted owls at any of these sites during other years.

Surveys conducted in 2009 reported one pair of NSO within the project area, located in the Snow Mountain area. No nest site or reproduction has been documented for this site. In addition, surveys completed in 2011 documented a single male NSO-barred owl cross at various locations near this pair.

Table 141. Northern spotted owl observations and status on the Lassen National Forest

Year	Number of Birds	Sex	Pair	Young	Reproductive Status
1982	1	Unknown	No	No	Single
1989	2	Male	No	No	Single
1991	5	Male	No	No	Single
1992	2	Male	No	No	Single
1995	2	Female	No	No	Single
1996	3	Female	No	No	Single
2000	1	Unknown	Unknown	Unknown	Unknown
2004	0	-	-	-	-
2005	0	-	-	-	-
2009	2	M/F	Yes	No	Unknown
2011	1	M (NSO-barred owl	No	No	No

Habitat Status

The spotted owl is a forest-dwelling owl strongly associated with late-successional forests that have a complex multi-layered structure, large-diameter trees, and high overstory tree canopy (Bias and Gutiérrez 1992). Nest stands often have a well-developed hardwood understory (e.g., canyon live oak (*Quercus chrysolepsis*)) and a conifer overstory. However, nest stands on Lassen National Forest generally consist primarily of conifers (USDA Forest Service 2010). Spotted owl habitats are consistently characterized by greater structural complexity compared to available forest habitat.

The spotted owl breeding season is March 1 through August 31. Breeding activity for spotted owls is broken into 5 stages (pre-laying, laying, incubation, nestling, and fledging) and roughly parallels the time frame of goshawks. Pre-laying behavior in spotted owls begins in March and lasts for 3 weeks prior to the laying of the first egg. Egg-laying starts from April 11 to 25 and can take 1 to 6 days to complete. Incubation starts with laying of the first egg and lasts 28 to 32 days. Nestlings fledge after 34 to 36 days around June 12 to 26 (Forsman et al. 1984). Much of the data available for spotted owl breeding phenology is derived from the northern spotted owl subspecies.

Foraging

NSO forage in forested habitats with hunting perches and a stand structure that allows for flight in the understory and access to prey. The following is summarized from USDI Fish and Wildlife Service (2009):

> "Habitats used by NSO are highly variable, particularly in the diverse conifer-hardwood forests of the Klamath Province"
>
> "Spotted owls also forage within intermediate (younger and/or more open) forest classes. One study (Zabel et al. 2003) found a positive association between NSO in the Klamath Province and moderate amounts of intermediate forest at the core area scale. This habitat class was based on conditions known to be used by foraging NSO."
>
> "Foraging habitat encompasses nesting and roosting habitat but includes a broader range of structure and might not support successful nesting by NSO (Gutiérrez 1996, USDI Fish and Wildlife Service 2008). Foraging NSO generally use older, denser, and more complex forest than expected based on its availability, but they also use younger forest (Solis and Gutiérrez 1990, Carey et al. 1992, Carey and Peeler 1995, Irwin et al. 2007)."

> "Foraging habitat encompasses a broad range of structure, and low-quality foraging habitat includes younger and more open habitats that may be important for prey production."

Based on the extensive research review conducted, the USFWS went on to define "infrequently-used," low-quality foraging habitat as having a minimum of 40 percent canopy cover and 11-inch dbh conifer trees.

Prey Species

In this portion of the northern spotted owl's range (below about 4,100 feet in southern Oregon and northern California), dusky-footed woodrats (*Neotoma fuscipes*) are the most important prey species of spotted owls, both in frequency and biomass (Forsman 1976, Forsman et al. 1984, Zabel et al. 1995, Ward et al. 1998).

Sakai and Noon (1993) found the highest abundance of woodrats in 15- to 30-year-old plantations resulting from past clearcut timber harvest. The study used radio telemetry to track the movement of woodrats and found that although they inhabited younger stands, woodrats would often cross distinct ecotonal boundaries between forest types. Woodrats tracked during evening telemetry sessions made intermittent, short-distance movements into adjacent old-growth forests occupied by spotted owls. Predators killed a substantial number of radio-tagged woodrats, and carcasses were most often found in adjacent old forest. This is presumably because the younger, dense plantations are difficult for owls to forage in and they must wait until the prey leave these refugia.

Ward et al. (1998) found that owls foraged along late-seral forest edges where dusky-footed woodrats were more abundant. Woodrats living in or dispersing from adjacent shrub lands may be more available for owls hunting along the ecotonal edges between habitat types. Edge or transitional habitats appear to be more important to foraging spotted owls when woodrats dominate the diet (Zabel et al. 1995, Ward et al. 1998). Edges may provide cover to conceal owls from predators while making them inconspicuous to woodrats.

These results suggest that the infrequent use of younger stands by foraging spotted owls is not due to low abundance of prey. Simply increasing prey densities within a stand may not result in an increase in prey available to spotted owls if their foraging efficiency is low in these stands (Rosenberg et al. 1994). High tree densities and homogeneous canopies in second-growth forests may reduce flight maneuverability and the ability of owls to capture prey (Rosenberg and Anthony 1992). However, silvicultural procedures that maintain or enhance woodrat populations adjacent to spotted owl habitat may benefit spotted owls (Sakai and Noon 1993, Irwin et al. 2007).

The northern flying squirrel (*Glaucomys sabrinus*) is a smaller component of the biomass collected by the spotted owl. In northwestern California, flying squirrels constitute only 9.3 percent of the biomass of northern spotted owl diet, while dusky-footed woodrats constitute 70.9 percent of the biomass of northern spotted owl diet (Ward et al. 1998). Forsman et al. (1984) described potential negative impacts to flying squirrels through the loss of the truffle crop; however, the conditions described by Forsman occurred in heavily thinned mature and old-growth stands.

Approximately 26,240 acres of lands administered by the Lassen National Forest occur within the range of the northern spotted owl and 13,432 acres of northern spotted owl suitable habitat occurs within the analysis area.

Northern spotted owl critical habitat was originally designated in 1992, revised in 2008, and most recently revised in 2012 (USDI Fish and Wildlife Service 2012). Approximately 2,736 acres of designated critical habitat within the Interior California Coast, Subunit 8 (ICC-8) overlap lands

administered by the Lassen National Forest in the northwestern portion of the Hat Creek Ranger District and includes areas of Late Successional Reserve (LSR; 236 acres). Only about 440 acres within designated critical habitat constitute suitable nesting and roosting habitat (CWHR 5D stands), with an additional 1,622 acres in CWHR 4D stands.

The existing environment refers to the existing conditions and relevant conservation or analysis units within the Action Area (LSR, matrix, critical habitat). It is a component of the environmental baseline, which is maintained by the USFWS. The environmental baseline includes "…the past and present impacts of all Federal, State, or private actions and other human activities in an action area, the anticipated impacts of all Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process." [50 CFR §402.02] The past and present impacts of all Federal, State and private activities in the Action Area, in combination with natural disturbance events and in-growth of vegetation represent the existing condition. The existing condition fully reflects the aggregate impact of all prior human actions and natural events that have influenced and contributed to the environmental baseline. The existing environment is the best representation of the NSO biological baseline relative to assessing project effects and can include other aspects such as the known or possible presence of competitors or predators as relevant to species-level effects as well as existing ambient noise levels (e.g., rivers, creeks, traffic).

Direct and Indirect Effects

Resource Indicators and Measures

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to northern spotted owl are listed in table 142.

Table 142. Resource indicators and measures for assessing effects to northern spotted owl

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to or displacement of individuals from noise and increased human presence, injury or mortality of individuals	Acres and percentage of important habitat impacted by OSV use	49 acres (< 1%) nest/roost habitat; 6,176 acres (46%) forage habitat	44 acres (< 1%) nest/roost habitat; 5,798 acres (43%) forage habitat	9 acres (< 1%) nest/roost habitat; 747 acres (6%) forage habitat	49 acres (< 1%) nest/roost habitat; 6,176 acres (46%) forage habitat	0 acres
Potential for disturbance to or displacement of individuals from OSV use and increased human presence, injury or mortality of individuals	Acres and percentage of buffered NSO activity center impacted by OSV use	2 (0%)	2 (0%)	2 (0%)	2 (0%)	0

Northern spotted owl is associated with late-successional forests that can be impacted by activities associated with trails. Gaines et al. (2003) conducted a literature review of 71 late-successional-forest-associated wildlife species and identified negative effects on these species that can result from trail-associated factors. These impacts include direct loss of habitat from type conversion, diminished

quality of habitat attributes or fragmentation, and road avoidance or displacement resulting from direct harassment or noise disturbance. Individuals, environmental groups, and agency biologists have expressed growing concern over habitat fragmentation for late-successional forest-associated species. Various studies have shown that this species group is vulnerable to disturbance, changes in habitat, or displacement by habitat generalists.

As found in the Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004), habitat types important for late-successional forest include stands typed as 4M, 4D, 5M, 5D, and 6 by California Wildlife Habitat Relationship (CWHR), which are all stands of trees greater than 11 inches dbh with greater than 40 percent canopy cover. The Sierra Nevada Forest Plan Amendment provides management direction for Old Forest Emphasis Areas to maintain or develop old forest habitat in areas containing the best remaining large blocks or landscape concentrations of old forest. Direction also includes providing for old forest functions, such as connectivity of habitat over a range of elevations to allow migration of wide-ranging old-forest-associated species.

Snowmobile use within late-successional forest habitats can have the following direct effects to individuals or their habitat (Gaines et al. 2003): Disturbance and potential for injury or mortality to individuals from vehicle collisions.

Disturbance:

- Displacement of populations or individual animals from a route, related to human activities.
- Disturbance and displacement of individuals from breeding or rearing habitats.
- Physiological response to disturbance, resulting in changes in heart rate or level of stress hormones.

Potential for Injury or Mortality to Individuals from Vehicle Collision:
As previously discussed, the likelihood of a collision between snow grooming equipment and wildlife is extremely low because the equipment travels slowly (3 to 6 mph). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds.

Potential indirect effects include:

- Altered or dispersed movement as caused by a route or human activities on or near a route.
- Snow compaction (prey base for several of the other late-successional forest species under consideration).

In addition, Gaines et al. (2003) found an interaction that occurred on winter recreation trails was the indirect effect of snow compaction on the subnivean sites used by small mammals in which small mammals can either be suffocated as a result of the compaction, or their subnivean movements can be altered because of impenetrable compact snow. Adverse effects to subnivean animals could indirectly affect the prey base for many Forest Service sensitive species, including northern spotted owl.

Forsman et al. (1984) indicate that northern spotted owl courtship behavior usually begins in February or March with the timing of nesting and fledging varying by elevation and latitude. April 1 coincides with incubation in most areas (USDI Fish and Wildlife Service 2012). The OSV grooming season generally begins in mid-December and continues through March. Start and stop times vary by trail location and are dependent upon the presence and depth of snow. Inspections of the Lassen National Forest snow parks on April 17 and May 1, 2010, showed that OSV enthusiast activity extends beyond the March 31 termination date closing roads for exclusive OSV use. OSV use was assumed to be very low (fewer than 10 riders per site per day on a weekend), depending on specific

snow depths and daily temperatures. OSV use was documented until the end of April, at which point snow levels no longer allow continued use of designated OSV trails. For purposes of analysis, April 30 is used as a cut-off date for the maximum period of interaction (California OSV Program Final EIR (2010)).

Northern spotted owl observation points and activity centers in table 141 (page 435) reflect a cumulative count of both observations and known nest sites over time for survey efforts since 1982. Under all alternatives (1, 2, 3, 4, and 5) there are no groomed trails, designated non-groomed trails, or plowed parking areas within one-quarter mile of known northern spotted owl activity or past observations. The nearest such feature consists of a groomed trail located approximately 17 miles from the northern spotted owl range delineation for lands administered by the Lassen National Forest. Therefore, there would be no effect to northern spotted owl resulting from groomed trails, designated non-groomed trails, trail maintenance (including removal of obstacles such as down trees), or plowed parking activities.

Areas within northern spotted owl range are; however, designated for use of existing routes (roads and trails) as well as designated for cross-country travel by OSVs. However, due to the structural nature of suitable habitat (i.e., dense forested stands), the level of cross-country travel in northern spotted owl suitable habitat is expected to be low, and most disturbance is likely to occur primarily along existing roads and trails. Review of past observations and mapping shows that northern spotted owl locations vary in proximity to roads, with several observations occurring adjacent to existing roads designated for vehicular traffic under the travel management system (USDA Forest Service 2011). The activity center for the known owl pair in the Snow Mountain area occurs immediately adjacent to Road 37N08 (Snow Camp Road), which is maintained for high-clearance vehicle travel. Non-OSV as well as OSV access, including a low potential for cross-country travel, has been occurring over the past 30-plus years. Some species can habituate to disturbance and individuals or pairs can successfully reproduce with a range of minor to substantial disturbance depending on their adaptability and rate of previous exposure. The presumed levels of variable tolerance do not relieve the impacts of disturbance, however, those impacts are difficult to detect or measure (USDI Fish and Wildlife Service 1998).

There is some potential for direct effects due to collisions with vehicles. However, because northern spotted owls spend little time at ground level, the potential for injury or mortality due to colliding with an OSV is very low.

The Forest Service considers activities greater than one-quarter mile (400 meters) from a spotted owl nest site to have little potential to affect spotted owl nesting. In addition, Delaney et al. (1999) found that Mexican spotted owls were found to show an alert response to chainsaws at distances less than one-quarter mile. Results of a northern spotted owl study on the Mendocino National Forest in northern California indicated that spotted owls did not flush from nest or roost sites when motorcycles were greater than 70 meters (230 feet) away and sound levels were less than 76 owl-weighted decibels (dBO) (Delaney and Grubb 2003). Noise levels of OSVs (e.g., snowmobiles) are considered in this analysis to be comparable to those generated by motorcycles.

Behavioral responses to disturbance, such as leaving an area, can be readily observed (Tempel and Gutierrez 2003). Physiological responses to disturbance are not as easy to detect because they are not necessarily associated with behavioral responses (Tempel and Gutierrez 2003). Research has been conducted to measure the effects of noise on physiological stress levels of northern and California spotted owls by analyzing fecal corticosterone (e.g., Wasser et al. 1997, Tempel and Gutierrez 2003, Tempel and Gutierrez 2004) and fecal glucocorticoid (Hayward et al. 2011). It is difficult to tease out background differences in fecal corticosterone and fecal glucocorticoid levels from variables such as

environment, body condition, and gender (Tempel and Gutierrez 2004; Hayward et al. 2011), making cause and effect determinations of whether disturbance is related to the action being tested or some other factor. The studies varied in design, analysis, and conclusions. The study by Hayward et al. (2011) is most similar to conditions in this project in that it used OHVs. The vehicles traveled back and forth along a 0.5-mile length of road within 5 to 800 meters of roost or nest locations for a period of one hour. Results from this study indicate that there were increased levels of fecal glucocorticoid and reduced reproductive success in response to this level of activity (Hayward et al. 2011).

Comparison of the Alternatives

A total of 13,432 acres of northern spotted owl suitable habitat occurs within the analysis area. Of this, 13,146 acres (98 percent) is currently open to OSV use (table 143). However, 46 percent is designated for and of moderate to high (less than 70 percent canopy closure and less than 21 percent slope; see assumptions section) OSV use (map BE-1)[10]; the same would be true under alternative 4 (map BE-4). This is the area with potential for direct and indirect effects to NSO from OSV use and related activities to occur. Under alternative 2, 43 percent of suitable habitat that would be designated for OSV use would be moderate to high OSV use (map BE-2). Under alternative 3, only 6 percent of suitable habitat would be designated for and of moderate to high OSV use (map BE-3). Under alternative 5, no areas are designated for cross-country OSV use; therefore, this alternative reduces the potential for direct and indirect effects in comparison to all other alternatives including the existing condition (map BE-5).

When considering the single northern spotted owl activity center within the analysis area, the entire activity center buffered by 0.7 miles is designated for OSV use. However, none of that designated area is of moderate to high OSV use under any of the alternatives (table 144; maps BE-6, BE-7, BE-8, BE-9, and BE-10).

[10] All BE maps referenced are located with the wildlife analysis in the project record.

Table 143. Acres of suitable northern spotted owl habitat with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	Nest/ Roost	**Forage**	**Nest/ Roost**	**Forage**	**Nest/ Roost**	**Forage**	**Nest/ Roost**	**Forage**	**Nest/ Roost**	**Forage**
Designated for OSV use	744	12,402	704	11,397	245	3,916	744	12,402	0	0
Not Designated for OSV use	6	280	46	1,285	505	8,766	6	280	750	12,682
OSV use restricted to trails	NA		NA		0	0	NA		0	0
Total	13,432 acres (750 acres nest /roost habitat; 12,682 acres forage habitat)									
Designated for OSV use and of moderate to high OSV use	49	6,176	44	5,798	9	747	49	6,176	0	0
Not Designated for OSV use and of moderate to high OSV use	1	82	6	460	41	5,511	1	82	50	6,258
Moderate to high OSV use and OSV use restricted to trails	NA		NA		0	0	NA		0	0
Total	6,308 acres (50 acres nest/ roost; 6,258 acres forage)									

Table 144. Acres of known northern spotted owl activity centers, buffered by 0.70 miles, with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	642	642	639	642	0
Not Designated for OSV use	0	0	3	0	642
Moderate to high OSV use and OSV use restricted to trails	NA	NA	0	NA	0
Total	642				
Designated for OSV use and of moderate to high OSV use	2	2	2	2	0
Not Designated for OSV use and of moderate to high OSV use	0	0	0	0	2
OSV use restricted to trails	NA	NA	0	NA	0
Total	2				

Snowmobiles passing within 0.25 mile of unsurveyed nesting/roosting habitat or an active nest have the potential to disturb nesting northern spotted owls. The highest reproductive status observed in the project area was pair status; however, no northern spotted owl surveys have occurred in the project area since 2011. The intensity and duration of noise-generating activities tested by Hayward et al. (2011) are not expected to occur as a result of the proposed action. The noise associated with snowmobile use in the action area is expected to be of short duration (amount of time it would take to travel through any one given area) and of intermittent intensity (amount of concentrated noise). In addition, the area containing northern spotted owl suitable habitat is not near infrastructure that may facilitate OSV use of the area, including snow parks, and parking lots, as well as designated non-groomed and groomed trails. Therefore, OSV use in northern spotted owl habitats is expected to be low. Under alternative 5, no trails or areas that overlap with northern spotted owl suitable habitats and mapped distribution within the project area are proposed to be designated for OSV use. There would be no noise disturbance generated by OSVs under this alternative, and a corresponding net decrease in potential noise disturbance compared to the existing condition.

None of the alternatives propose to alter vegetation; therefore, they would not remove, downgrade, or degrade habitat for the northern spotted owl. Snowmobile use is not expected to substantially impact northern spotted owl foraging behavior or their ability to locate prey. While northern spotted owls may opportunistically forage during the day (e.g., capture prey at the immediate roost or nest site), they primarily forage at night when snowmobile activity is much less likely to occur. Prey are not expected to be impacted by snowmobile use as they are not likely to reside in the immediate footprint of the road or trail, and because material removed from the trails for safety that could provide cover would be left on site. As stated previously, there is low potential for cross-country OSV travel in dense stands used by northern spotted owl and their prey. Prey may be temporarily startled by noise as a snowmobile passes by; however, the overall abundance and availability of prey would not change as a result of the proposed action.

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, no foreseeable vegetation management or fuels management projects are projected to occur within northern spotted owl habitats on lands administered by the Lassen National Forest and adjacent NFS lands. Both firewood

cutting and Christmas tree cutting are restricted from areas with known northern spotted owl observations (USDA Forest Service 2014). Vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires. These projects are usually excluded from spotted owl reproductive habitat (i.e., Late Seral Reserves). Management prescriptions have emphasized recruitment of large snags and logs, as well as retention of large conifer, over a 20-year period. These are all important habitat attributes for spotted owl foraging habitat. Livestock grazing allotments are located within northern spotted owl distribution, but because livestock are normally present on allotments during the snow-free period, overlap of effects with this project are unlikely.

Recreational activities such as hunting and fishing are expected to continue at levels similar to existing conditions. Use of roads within northern spotted owl habitats for hunting access contributes a level of disturbance during the end of the northern spotted owl breeding season. This is incorporated into the environmental baseline for disturbance. Timber harvest and State and private lands within one-quarter mile of northern spotted owl habitats may impact habitat availability outside NFS lands and may increase disturbance locally. However, existing availability of suitable northern spotted owl habitat on private lands is expected to be low.

In summary, ongoing and reasonably foreseeable actions may be additive locally, but are not expected to contribute substantial impacts to effects discussed for the project under any alternative.

Determination Statement

Based on the above discussions, the Lassen National Forest Over-snow Vehicle Use Designation Project may affect, but is not likely to adversely affect the northern spotted owl, for alternatives 1, 2, 3, and 4, based on the following rationale:

- The OSV proposed actions would not modify any suitable (nesting, roosting or foraging), dispersal, or capable habitat within the OSV area.
- Although the potential for noise-based disturbance to individuals within suitable habitat ranges from 6 to 46 percent under alternatives 1, 2, 3, and 4, the percentage of habitats impacted would actually be lower considering that the concentration of OSV use is not equal across the landscape. Northern spotted owl habitats are not near infrastructure, including snow parks, and parking lots, as well as designated non-groomed and groomed trails, that may facilitate OSV use of the area. Although the whole of the single activity center within the analysis area is designated for OSV use, none of it is of moderate to high OSV use. Therefore, OSV use in northern spotted owl habitats is expected to be low. Noise generated through OSV use is expected to be intermittent and of short duration within and near unsurveyed suitable habitat, and would occur within the early part of the breeding season.
- OSV use is unlikely to influence northern spotted owl foraging or prey availability because owls forage at night when OSV use is low to non-existent.
- OSV use is dispersed across the landscape and is not concentrated in space or time.
- The potential for OSV collision with individual northern spotted owl s is very low.

Based on the above discussions, the Lassen National Forest Over-snow Vehicle Use Designation Project, alternative 5, may affect, but not likely to adversely affect - beneficial effect on the northern spotted owl based on the following rationale:

- No trails or areas overlapping northern spotted owl suitable habitat and mapped distribution within the project area are designated for OSV use under this alternative.

- The lack of OSV use in areas containing suitable northern spotted owl habitats represents a net decrease in potential noise disturbance levels in comparison to the existing condition.

Northern Spotted Owl Designated Critical Habitat

Northern spotted owl critical habitat was originally designated in 1992, revised in 2008, and most recently revised in 2012 (USDI Fish and Wildlife Service 2012). Approximately 2,736 acres of designated critical habitat within the Interior California Coast, Subunit 8 (ICC-8) overlap lands administered by the Lassen National Forest in the northwestern portion of the Hat Creek Ranger District and includes areas of Late Successional Reserve (LSR; 236 acres). Only about 440 acres within designated critical habitat constitute suitable nesting and roosting habitat (CWHR 5D stands), with an additional 1,622 acres in CWHR 4D stands.

Primary Constituent Elements

The 2012 designation of critical habitat for the northern spotted owl identifies the physical and biological features essential to the conservation of the northern spotted owl as forested lands that can be used for nesting, roosting, foraging, or dispersal (USDI Fish and Wildlife Service 2012). The primary constituent elements (PCEs) of the physical or biological features that are essential to the conservation of the northern spotted owl are:

PCE 1: forest types that may be in early-, mid-, or late-seral stages and that support the northern spotted owl across its geographical range*;

PCE 2: nesting/roosting habitat;

PCE 3: foraging habitat;

PCE 4: dispersal habitat

*PCE1 must occur with PCE 2, 3, or 4

Determination Statement

No vegetation treatments or alterations are proposed under any alternative. The primary constituent elements of the physical and biological features that are essential to the recovery of the species would not be affected by proposed activities under any alternative. Therefore, there would be no effect to northern spotted owl designated critical habitat.

Gray Wolf (*Canis lupus*)

Threatened

Species Account

In February 2011, the Oregon Department of Fish and Wildlife radio-collared a single male gray wolf, designated OR7. Tracking data indicates OR7 entered California on December 28, 2011, and travelled hundreds of miles within the state. As of February 2014, OR7 had returned to Oregon. Future movements of OR7 are unpredictable and it is beyond the scope of the biological assessment (project record) to predict whether OR7 would move back into California, remain in Oregon, or travel elsewhere. However, a CDFW trail camera in Siskiyou County, California, recorded a lone canid in May and July 2015. Additional cameras in the area took multiple photos showing two adults and several pups on public and private lands primarily in western Lassen County (CDFW 2015). The CDFW designated this group as the Shasta Pack. In early 2017, biologists found evidence of wolf

presence on the Lassen National Forest, and in July 2017, CDFW confirmed the presence of 2 adults and several pups (designated as the Lassen Pack) on public and private lands primarily in western Lassen County (CDFW 2017). Updated information shows approximate pack activities overlap with the southeastern portion of the Lassen National Forest (CDFW 2018a).

Habitat Status

Gray wolves are habitat generalists inhabiting a variety of plant communities, typically containing a mix of forested and open areas with a variety of topographic features. Historically, they occupied a broad spectrum of habitats including grasslands, sagebrush steppe, and coniferous, mixed, and alpine forests. They have extensive home ranges and prefer areas with few roads, generally avoiding areas with an open road density greater than 1.0 mile per square mile (Witmer et al. 1998).

Dens are usually located on moderately steep slopes with southerly aspects near surface water. Rendezvous sites, used for resting and gathering, are complexes of meadows adjacent to timber and near water. Both dens and rendezvous sites are often characterized by having nearby forested cover remote from human disturbance. Wolves are strongly territorial, defending an area of 75 to 150 square miles, with home range size and location determined primarily by abundance of prey. Wolves feed largely on ungulates. Wolves are generally limited by prey availability and threatened by human disturbance. Generally, land management activities are compatible with wolf protection and recovery, especially actions that manage for viable ungulate populations.

Because wolves are habitat generalists, vegetation types and structural conditions across the project area are potentially open to utilization. However, more suitable areas would contain lower levels of human occurrence, including areas of lower road densities (Thiel 1985), and adequate prey (i.e., ungulate) availability (USDI Fish and Wildlife Service 1987). More suitable areas occur in the northern and western portions of the Hat Creek Ranger District; areas within and adjacent to Lassen Volcanic National Park; and southern portions of the Almanor Ranger District.

Direct and Indirect Effects

Resource Indicators and Measures

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to the gray wolf are listed in table 145.

Table 145. Resource indicators and measures for assessing effects to the gray wolf

Resource Element	Resource Indicator	Measure (Quantify if possible)	All Alternatives
Habitat Quality	Habitat Removal or Degradation	Acres and percentage of Habitat Removed or Degraded	0
Species Use of Available Habitats	Disturbance and/or Displacement from All or Portions of a Species Home Range	Overlap of acres of disturbing or potentially displacing activity within species' disturbance distance thresholds	See analysis
Injury or Mortality	Potential for Injury or Mortality of Individuals	Risk Level of Potential for Injury or Mortality	Very Low

Snowmobile use and associated activities within habitats for wide-ranging carnivores can have the following effects to individuals or their habitat (Gaines et al. 2003). Potential direct effects include: (1) Displacement or avoidance away from human activity on or near roads; (2) Displacement of

individual animals from breeding or rearing habitat; and (3) Physiological response to disturbance resulting in changes in heart rate or level of stress hormones.

There is also a potential for injury or mortality to individuals from vehicle collision. As previously discussed, the likelihood of a collision between snow grooming equipment and wildlife is extremely low because the equipment travels slowly (3 to 6 mph). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds. Vehicle collision with a gray wolf or wolverine would negatively affect that particular animal, but the likelihood of occurrence is assumed to be rare.

Potential indirect effects include behavioral modification such as altered or dispersed movement as caused by a route or human activities on a near a route.

Common Effects of Travel Management

Effects to gray wolves are described in terms of threats to wolves through human contact and conflict (i.e., livestock or grazing concerns), through activities that compromise denning or rendezvous sites, or through activities that affect prey base.

Human Conflict

Wolves initially experienced population declines due mainly to conflicts with humans. This included human settlement, direct conflict with livestock, and a lack of understanding of wolf ecology and habits as well as subsequent eradication programs (USDI Fish and Wildlife Service 1987). Today, human conflict still exists, most notably over livestock depredations and the associated economic losses.

Denning and Rendezvous Sites

Wolves may use den sites from year to year, and certain areas may contain several den sites that wolves use in different years (USDI Fish and Wildlife Service 1987). Wolf packs appear sensitive to human disturbance near den sites and may abandon the site (Ballard et al. 1987). Subsequently, most den sites are located away from trails and backcountry campsites.

Rendezvous sites refer to specific resting and gathering areas wolves use during the summer and early fall. Several rendezvous sites are used with the first one generally located between 1 to 6 miles from the natal den. A pack uses rendezvous sites until the pups are mature enough to travel with the adults, generally early autumn. Wolves appear to be most sensitive to human disturbance at the first rendezvous site and become less sensitive at later sites. However, wolf response to human disturbance is due to a variety of factors including specific setting, individuality of wolves, and whether the population is exploited or protected (USDI Fish and Wildlife Service 1987).

Because biologists routinely monitor satellite collar GPS locations and visit areas (CDFW 2018b), the locations of den dens and rendezvous sites will likely be readily identified. In order to prevent potential disturbance impacts to gray wolf denning and rendezvous sites, the following mitigation measure would apply to all action alternatives (Volume II, Appendices C and D):

> *Proposed project activities will cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites will be closed to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service will provide this information to the Service and the California Department of Fish and Wildlife.*

Prey Base

Wolves prey primarily on ungulates (USDI Fish and Wildlife Service 1987). During all seasons, ungulates constitute the highest percentage of biomass. Because they are an important prey item, factors affecting ungulate distribution and abundance (e.g., habitat and access management, winter range productivity) also affect wolves. Mule deer can be expected to provide the most frequent foraging opportunities for wolves because they are the most numerous and accessible ungulate within the project area. Due to seasonal overlap between the proposed activities (OSV use) and potential effects to wolf prey base, impacts considered in this analysis are confined primarily to mule deer occurrence on winter range.

Effects from This Project

There could be disturbance effects to denning wolves if a natal den location overlaps with areas of OSV use. The denning period is estimated to last from mid-March through mid-June; therefore, there is potential for overlap during the earliest portion of the denning period. No impacts to structure and composition of habitats would occur under any alternative. Because there are known wolf locations to the north, wolves may be transient in the project area. However, since there have been no recent reported sightings and no known mortalities, it is assumed that the potential for direct effects resulting from injury or mortality due to vehicle collisions is very low.

Incidental disturbance of individual wolves from OSV use of established trails and cross-country travel is possible. The degree of effect is likely related to the intensity and duration of OSV disturbance. Studies of snowmobile use and wolf movements in Voyagers National Park (Olliff et al. 1999) have shown that wolves tend to avoid areas of snowmobile activity in restricted-use areas. The studies also showed that repeated avoidance or displacement could result in permanent displacement, an impact to an animal's winter energy budget, and/or a conditioning of the animal to avoid certain areas. The literature also shows that wolves both used and avoided roads and trails designated for winter use. Although wolves use snowmobile trails for travel and foraging, they show decreased use or avoidance of roads and trails that had higher levels of human presence (Olliff et al. 1999, Whittington et al. 2005).

OSV use of groomed trails is expected to be frequent under all alternatives. Consequently, there is an increased likelihood that wolves would avoid these areas. All alternatives contain nearly identical amounts of groomed trails (406 to 408 miles); therefore, the effect of groomed trails is similar. Existing linear routes (i.e., roads and trails) in areas outside groomed trails designated for OSV travel (including existing roads and trails) are expected to receive less human use, resulting in decreased disturbance and potential displacement of wolves. Areas outside of existing linear trails and designated for cross-country travel are also expected to receive less OSV use due to potential for physical barriers and slope limitations, although open meadows or parks adjacent to linear trails may attract more use. The amount of area designated for OSV travel varies by alternative. Alternative 1 would be the least restrictive, not designating 186,000 acres for OSV use. Alternative 4 would restrict travel within 191,090 acres, while the proposed action provides restrictions on 228,890 acres. Alternative 5 would be the most restrictive, not designating 510,540 acres for OSV use. Alternative 5 would not designate areas below 3,500 feet elevation for OSV use, which would include all portions of mapped mule deer winter range.

Impacts to Primary Prey

Wintering deer are sensitive to disturbances of all kinds. Both snowmobiles and cross-country skiers are known to cause wintering ungulates to flee (Freddy et al. 1986). Dorrance et al. (1975) found that snowmobile traffic resulted in increased home range size, increased movement, and displacement of

deer from areas along trails. Direct environmental impacts of snowmobiles include collisions causing mortality and harassment that increased metabolic rates and stress responses (Canfield et al. 1999).

No groomed or non-groomed designated OSV trails occur within mule deer winter range under any alternative. However, OSV use of existing linear trails is designated within winter range at some level under all alternatives, and cross-country travel is designated at some level under all alternatives, except alternative 5. Approximately 119,333 acres of mule deer winter range occurs within the project area. A total of 59,453 acres of winter range (roughly 50 percent of existing) is closed or not designated for OSV use under alternatives 1 and 4 (table 146; maps BE-11 and BE14, respectively). Roughly 59,453 acres (50 percent) are designated, but only 19,980 acres (17 percent) is designated for and of moderate to high OSV use under the OSV use assumptions. Therefore, under alternatives 1 and 4, mule deer would have the potential to be subject to disturbance, mortality, injury, or altered movement from low to no OSV use across 17 percent of their winter range. OSV use would not be designated on additional winter range under both the proposed action and alternative 3 (maps BE-12 and BE-13), respectively. Under alternatives 2 and 3, mule deer would have the potential to be subject to disturbance, mortality, injury, or altered movement across only eight to 13 percent of their winter range. No areas within mule deer winter range are designated for cross-country travel under alternative 5 (map BE-15); therefore, this alternative reduces the potential for direct and indirect effects in comparison to all other alternatives including the existing condition.

Table 146. OSV areas not designated for cross-country travel by alternative

OSV Management	Current OSV Management	Proposed Action	Alternative 3	Alternative 4	Alternative 5
Total Area (Acres)	186,000	229,760	316,7400	194,550	517,260
OSV Use Not Designated within Mule Deer Winter Range (percent of total winter range acres)	59,453 (50%)	78,116 (65%)	90,552 (76%)	59,453 (50%)	119,333 (100%)
Mule Deer Winter Range Designated for OSV Use and of Moderate to High OSV Use (percent of total winter range acres)	19,980	15,871	9,959	19,980	0

Summary of Effects

Public OSV use would not be designated on at least 50 percent of mule deer winter range under all alternatives. By comparison, alternative 5 provides the largest amount of area where OSVs would be excluded, thereby potentially producing the lowest amount of disturbance spatially in addition to avoiding cross-country travel within all deer winter range. Alternative 3, the proposed action, alternative 4, and alternative 1 follow in order of increasing disturbance potential to wolves based on total acres available for OSV use. However, because wolves are known to follow prey species seasonally, potential effects during the project's active period (December through April) are more likely to occur at lower elevations where deer would be distributed during that time of year. While all alternatives provide some disturbance-free portions within winter range, alternative 5 provides the largest amount of OSV-restricted area within mule deer winter range.

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, vegetation management or fuels management projects are projected to occur within Lassen National Forest lands suitable for use by wolves. These include timber harvest, fuels reduction, and associated activities, as well as road maintenance, firewood gathering, and special use activities. Vegetation management projects

identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. Recreational activities such as camping, hiking, hunting, and fishing are ongoing and expected to continue at levels similar to existing. Existing levels of livestock grazing may incur wolf-livestock conflicts if wolves become established, but because livestock are normally present on allotments during the snow-free period, overlap of effects with this project are unlikely. Use of roads for public and administrative access contributes a level of disturbance primarily during the snow-free period. This is incorporated into the environmental baseline for disturbance. Livestock on State and private lands adjacent to suitable habitats may increase risk of conflicts locally. In summary, ongoing and reasonably foreseeable actions may be additive locally, but are not expected to contribute substantial impacts to effects discussed for project under any alternative.

Determination Statement

All alternatives would have a low level of risk to wolves. Therefore, all alternatives of the Lassen National Forest Over-snow Vehicle Use Designation Project may affect, but are not likely to adversely affect gray wolves based on the following rationale:

- Mitigation measures are incorporated into all alternatives in order to prevent potential OSV disturbance impacts to fray wolf denning and rendezvous sites.
- Wolves are less likely to occur within most of the project area from December through April due to seasonal elevation shifts of prey species to winter range. Noise-based disturbance would largely be limited to only 8 percent to 17 percent of winter range of moderate to high OSV use, with the exception of alternative 5 under which no OSV use is designated in deer winter range.

Potential for direct impacts to wolves from collisions with OSVs is very low.

North American Wolverine (*Gulo gulo luscus*)

Proposed Threatened; Regional Foresters Sensitive Species

Species Account

Wolverines have a circumpolar distribution and occupy the tundra, taiga, and forest zones of North America and Eurasia (Wilson 1982). The species uses a wide variety of forested and non-forested habitats in North America (Banci 1994). In California, wolverines once occurred throughout the Sierra Nevada, Cascades, Klamath, and northern Coast ranges in alpine, boreal forest, and mixed forest vegetation types (Schempf and White 1977). Following dramatic increases in human development and disturbance (e.g., increased mining, fur trapping, and timber harvest) associated with the California gold rush of the mid-1800s (summarized in Zielinski et al. 2005) the distribution of wolverine in California was limited to the central and southern Sierra Nevada only (Ibid, Schempf and White 1977).

Primarily nocturnal, wolverines are difficult to observe, even when they are abundant (Banci 1994). An empirical wolverine habitat model developed for the Rocky Mountains found that wolverine occurrence was strongly associated with low human population density and low road density (Carroll et al. 2001).

An extensive furbearer study the Forest Service Pacific Southwest Research Station conducted from 1996 to 2002, using track plates and cameras on approximately 7,500,000 acres in the southernmost Cascades and Sierra Nevada range (estimated 150 of 344 sample units located within suitable wolverine habitats) did not detect this species and found that wolverines may be extirpated from or occur in extremely low densities within the area sampled (Zielinski et al. 2005).

On February 28, 2008, a detection of a lone male wolverine occurred near Truckee, California. This was the first verified record of a wolverine in California since 1922. Agency biologists and researchers used genetic samples (i.e., hair and scat) to determine that the wolverine is most closely related to, and most likely came from, a population on the western edge of the Rocky Mountains rather than either the historic California population (compared to samples taken from museum specimens) or contemporary northern Cascades (Washington) population (Moriarty et al. 2009). This attempted dispersal event may represent a continuation of the wolverine expansion in the contiguous United States and other wolverines may have travelled to the Sierra Nevada and remain undetected (USDI Fish and Wildlife Service 2013). Although incidental, unconfirmed sightings of wolverine have been reported throughout the Sierra Nevada, including Lassen National Forest (USDA Forest Service 2010), there is no evidence that California currently hosts a wolverine population or that female wolverines have made, or are likely to make, similar dispersal movements (USDI Fish and Wildlife Service 2013).

Wolverine effective population size in the northern Rocky Mountains, which is the largest extant population in the contiguous United States, is exceptionally low and is below what is thought necessary for short-term maintenance of genetic diversity; estimates for effective population size for wolverines in the northern Rocky Mountains averaged 35 (USDI Fish and Wildlife Service 2013).

Along the Pacific Coast, historical records show that wolverines occurred in two population centers in the North Cascades Range and the Sierra Nevada (USDI Fish and Wildlife Service 2013). However, records do not show occurrences between these centers from southern Oregon to northern California, indicating that the historical distribution of wolverines in this area is best represented by two disjunct populations rather than a continuous peninsular extension from Canada (USDI Fish and Wildlife Service 2013). This conclusion is supported by genetic data indicating that the Sierra Nevada and Cascades wolverines were separated for at least 2,000 years prior to extirpation of the Sierra Nevada population (USDI Fish and Wildlife Service 2013). Only one Sierra Nevada record exists after 1930, indicating that this population was likely extirpated in the first half of the 1900s.

Habitat Status

There are few studies about wolverine habitat use in the coterminous U.S.; the results of a 5-year study (Copeland et al. 2007) show wolverines used modestly higher elevations in summer versus winter, and they shifted use of cover types from whitebark pine (*Pinus albicaulis*) in summer to lower elevation Douglas-fir (*Pseudotsuga menziezii*) and lodgepole pine (*Pinus contorta*) communities in winter. Elevation explained use of habitat better than any other variable in both summer and winter. Grass and shrub habitats and slope also seemed desirable. Wolverine preferred northerly aspects, had no attraction to or avoidance of trails during summer, and avoided roads and ungulate winter range. In general, wolverines live at or above timberline, in areas relatively free from human disturbance, moving to lower elevations in winter likely due to prey availability.

Wolverine home ranges are large and variable. Home ranges in North America range from less than 38 square miles (100 square kilometers) to over 346 square miles (900 square kilometers). The average size of wolverine's home range is between 300 and 500 square kilometers (186 to 310 square miles, USDI Fish and Wildlife Service 2013). Home range sizes within the Sierra Nevada remain unknown. Males typically have larger home ranges than females, especially those with young. Male home ranges increase during the breeding season, likely driven by the distribution of females.

Within their geographic range, wolverine use diverse coniferous forest types (Hornocker and Hash 1981) and unlike fisher and marten, this species also uses non-forested alpine habitats (Banci 1994).

The presence of deep and persistent snow appears be a major contributing factor to habitat selection by wolverines. Wolverine select areas that are cold and receive enough winter precipitation to reliably maintain deep persistent snow late into the warm season (Copeland et al. 2010). Wolverines depend on persistent snow cover for successful reproduction (Copeland et al. 2010). No records exist of wolverines denning in snow-free habitats, despite the wide availability of these habitats within their range (USDI Fish and Wildlife Service 2013). Wolverines also appear to select areas that are free of significant human disturbance (summarized in USDA Forest Service 2001). A major threat to this species is loss of alpine habitat from climate change. Other potential threats to this species include habitat loss and fragmentation and increasing human presence.

Breeding occurs from late spring to early fall and females undergo delayed implantation until the following winter or spring when offspring are born typically from mid-February through March, although females will give birth in natal dens as early as January or as late as April (Banci 1994). Female wolverines use natal dens that are excavated in the snow and require persistent, stable snow conditions greater than 5 feet deep (Magoun and Copeland 1998, Copeland et al. 2010) presumably as thermal and predation protection (USDI Fish and Wildlife Service 2013). These dens are typically found at higher elevations than the average elevation used by non-reproductive wolverines (Magoun and Copeland 1998). Natal dens described in California were under rock ‘shelves’ at elevations above 10,000 feet (summarized in USDA Forest Service 2001). Females may use natal dens through late April or early May and may move kits to multiple maternal dens during May. Den abandonment is related to water accumulation from snowmelt, the maturation of offspring, and disturbance (USDI Fish and Wildlife Service 2013).

High and moderate capability wolverine denning habitat includes the following CWHR vegetation classes that are also in areas free of significant human disturbance. CWHR (2014) describes high capability denning and resting habitats as Lodgepole Pine (5M and 5D), Red Fir (5M and 5D), and Subalpine Conifer (5M and 5D); and moderate capability denning and resting habitats as Lodgepole Pine (all strata except 2S, 5M, and 5D), Red Fir (all strata except 5M and 5D), and Subalpine Conifer (all strata except 5M and 5D).

High capability foraging habitat is described as Alpine Dwarf-Shrub (all strata), Lodgepole Pine (5M and 5D), Red Fir (5M and 5D), and Subalpine Conifer (5M and 5D); and moderate capability foraging habitat as Lodgepole Pine (all strata except 2S, 5M, and 5D), Red Fir (all strata except 5M and 5D), Subalpine Conifer (all strata except 5M and 5D), and Wet Meadow (all strata).

Moderate and high capability resting habitat includes the CWHR vegetation classes described above and free from disturbance, as for denning habitat, but without the minimum elevation (10,000 feet). Similarly, high and moderate capability foraging habitat includes the CWHR vegetation classes described above for this habitat relationship type and free from disturbance.

This habitat generalist appears to select areas that are free of significant human disturbance and requires den sites associated with structural cover (e.g., boulders and persistent snow cover) in cirque basins or avalanche chutes at high elevations (summarized in USDA Forest Service 2001). The presence of deep and persistent snow appears be a major contributing factor to habitat selection by wolverines.

Although not currently known to exist on the Lassen National Forest, wolverines have been known to occupy habitats from 4,000 to over 10,000 feet elevation in the Sierra Nevada (USDA Forest Service 2010). Habitat for this species occurs in subalpine conifer habitats interspersed with

meadows (USDA Forest Service 2001). For this analysis, a total of 40,276 acres of habitat, based on the aforementioned criteria, is found within the project area (map BE-16).

Threats

Potential threats to this species include habitat loss and fragmentation, loss and alteration of alpine (snow) habitat from climate change, and increasing human presence (disturbance). The USDI Fish and Wildlife Service (2013) noted climate change as the threat with the greatest potential to impact wolverine. A warming climate will likely result in a loss of suitable habitat due to increased summer temperatures and a reduced incidence of persistent spring snowpack. The USDI Fish and Wildlife Service (2013) noted recreation as an additional threat to wolverines because mother wolverines tend to move their kits to alternate denning areas once humans have been detected nearby.

Direct and Indirect Effects

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to wolverine are listed in table 147.

Table 147. Resource indicators and measures for assessing effects to wolverine

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from noise and increased human presence, or injury or mortality of individuals	Acres and percentage of habitat affected and percentage of habitat impacted by OSV use	22,725 (56%)	22,572 (56%)	20,819 (52%)	22,618 (56%)	16,764 (42%)

Gray wolf (*Canis lupus*), Sierra Nevada red fox (*Vulpes vulpes necator*), and California wolverine (*Gulo gulo luteus*) are considered sensitive to the presence of humans and human activities.

The most common interactions between snowmobile trails and wildlife that Gaines et al. (2003) documented from the literature included trapping as facilitated by winter human access, disturbance-based displacement and avoidance,[11] and disturbance at a specific site,[12] usually wintering areas. To a lesser degree, hunting, trapping, poaching, collection, and habitat loss and fragmentation were other interactions identified. Trapping of wolverine, or any of the special-status species under consideration, is not legal in California and, therefore, would not be considered as a potential impact in this analysis.

Snowmobile use and associated activities within habitats for wide-ranging carnivores, such as wolverine, have the potential to affect individuals or their habitat (Gaines et al. 2003). Direct effects include disturbance by: (1) displacement from or avoidance of human activity on or near roads; (2) displacement of individual animals from breeding or rearing habitat; and (3) physiological response to disturbance resulting in changes in heart rate or level of stress hormones. There is also potential for injury or mortality to individuals from vehicle collision. As previously discussed, the likelihood of a collision between snow grooming equipment and wildlife is extremely low because

[11] Spatial shifts in populations or individual animals away from human activities on or near roads, trails, or networks
[12] Displacement of individual animals from a specific location that is being used for reproduction and rearing of young

the equipment travels slowly (3 to 6 mph). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds, but the likelihood is extremely low in the case of wolverines given that wolverines have not been documented on the Lassen National Forest and the tendency for wolverines to avoid areas used by humans. Potential indirect effects include behavioral modification such as altered or dispersed movement as caused by a route or human activities on or near a route.

Although recreational activities such as snowmobiling and backcountry skiing have the potential to affect wolverines (USDI Fish and Wildlife Service 2013), there are no verified detections of wolverine within one-quarter mile of snowmobile trails or anywhere on the Lassen National Forest. Except for the anomaly of one recent wolverine detection on the Tahoe National Forest, genetically related to the Rocky Mountain population (Moriarty et al. 2009), the species is thought to be extirpated from the Sierra Nevada.

OSV use and related activities would not physically modify vegetative composition or structure of suitable wolverine habitat. Wolverines, if present, would be expected to have little interaction with snowmobiles or snow grooming equipment: whereas the majority of snowmobile use on the Lassen National Forest occurs during the daytime, wolverine are highly nocturnal. In addition, wolverines are known to avoid roads and areas of human habitation; areas within 0.5 mile of OSV trails and staging areas receive the highest use and no new trails are proposed under any of the alternatives.

Comparison of the Alternatives

Table 148 shows the amounts of wolverine habitat in which a wolverine, if present on the Lassen National Forest, could be subject to direct or indirect effects of OSV use and associated activities. Eighty-one percent of suitable wolverine habitat is currently open to OSV use (alternative 1), but 56 percent is designated for OSV use and of moderate to high OSV use (map BE-16). The potential for OSV-related noise-based disturbance, injury or mortality impacting individual wolverines, should they be present, would be most likely to occur within that 56 percent of suitable habitat. In addition, of that 56 percent of habitat, high OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 miles of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within less than that 56 percent of wolverine habitat. Similarly, under alternatives 2 and 4, 56 percent of wolverine habitat would be designated and of moderate to high OSV use (maps BE-17 and BE-19, respectively). Under alternatives 3 and 5, 52 percent and 42 percent respectively, of wolverine habitat would be designated for and of moderate to high OSV use (map BE-20). If a wolverine were detected, an analysis would be conducted five miles around the sighting area to determine if activities have potential to affect the individual and if changes in management, including application of a limited operating period, are necessary, thereby minimizing impacts to wolverine.

Table 148. Acres of wolverine habitat with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	32,631	32,402	29,429	32,425	23,317
Not Designated for OSV use	7,644	7,874	10,847	7,851	16,959
OSV use restricted to trails	NA	NA	6	NA	6
Total	40,276 acres				
Designated for OSV use and of moderate to high OSV use	22,725 (56.4%)	22,572 (56%)	20,819 (51.3%)	22,618 (56.2%)	16,764 (41.6%)
Not Designated for OSV use and of moderate to high OSV use	5,266	5,419	7,172	5,373	11,227
Moderate to high OSV use and OSV use restricted to trails	NA	NA	5	NA	5
Total	27,991 acres				

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, actions that could result in a cumulative impact to wolverine, when combined with alternatives 1, 2, 3, 4, or 5 include vegetation management projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. Vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires. These projects are usually excluded from larger CWHR types and management prescriptions emphasize recruitment of large snags and logs, as well as retention of large conifer that are attributes of wolverine habitat. In addition, seasonal limited operating periods required for wolverine for vegetation projects prevent disturbance to breeding individuals.

Wolverine habitat overlaps with areas open to Christmas tree and firewood cutting and use of roads within wolverine suitable wolverine habitat after the March 31 termination date of the forest order closing roads for exclusive OSV use could occur. However, wheeled motorized vehicles may not be used off of authorized NFS roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014) and, due to their secretive nature, wolverines are likely to avoid roaded or heavily used roaded areas where disturbance or displacement would be more likely. Similarly, most non-motorized winter recreation occurs along designated trails and wolverine would probably avoid heavily used trails. Similar activities on State and private lands within the forest boundary may impact habitat availability outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown; State and privately held lands make up about 20 percent of the area within the forest boundary.

In summary, ongoing and reasonably foreseeable actions may be additive locally, but are not expected to contribute significantly to potential impacts to wolverine discussed for the project under any of the alternatives. In addition, seasonal limited operating periods that prevent disturbance to wolverine denning sites would be used to minimize disturbance to these sites if they are identified.

Determination Statement

Alternatives 1, 2, 3, 4 and 5 of the Lassen National Forest Over-snow Vehicle Use Designation Project will not jeopardize the continued existence of the North American wolverine, based on the following rationale:

- The single male wolverine detected near Truckee, California, is genetically most closely related to, and most likely came from, a population on the western edge of the Rocky Mountains, rather than either the historic California population. Although incidental, unconfirmed sightings of wolverine have been reported throughout the Sierra Nevada, including Lassen National Forest, there is no evidence that California currently hosts a wolverine population or that female wolverines have made, or are likely to make, similar dispersal movements into the area. Therefore, wolverine is not currently known to be present on the Lassen National Forest and there is no evidence that California currently hosts a wolverine population.
- Vegetative composition or structure of suitable wolverine habitat would not be physically modified by OSV use or related activities.
- Although the potential for noise-based disturbance to individuals within suitable habitat ranges from 42 to 56 percent of suitable habitat under all of the alternatives, the percentage of suitable wolverine habitat impacted would actually be lower considering that the concentration of OSV use is not equal across the landscape. In addition, if a wolverine were detected, an analysis would be conducted five miles around the sighting area to determine if activities have potential to affect the individual and if changes in management, including application of a limited operating period, are necessary, thereby minimizing impacts to wolverine.
- Wolverines, if present, would be expected to have little interaction with snowmobiles or snow grooming equipment: whereas the majority of snowmobile use occurs during the daytime, wolverine are highly nocturnal and snow grooming equipment moves at a very slow speed not likely to impact individuals. In addition, wolverines are known to avoid roads and areas of human habitation.

Forest Service Sensitive Species

Late-successional Forest Species

Pacific Fisher (*Pekania pennanti*)

Regional Foresters Sensitive Species

Species Account

In 2014, the U.S. Fish and Wildlife Service proposed to list the West Coast Distinct Population segment of fisher as threatened (USDI Fish and Wildlife Service 2014a). On April 18, 2016, the Service withdrew its proposal, based on their evaluation of the best scientific and commercial information available, and the species was placed on the Region 5 Regional Forester's Sensitive Species list (USDI Fish and Wildlife Service 2016a).

As generalized predators, fishers prey on a variety of small and medium-sized (e.g., woodrat [*Neotoma sp.*] and western gray squirrel [*Sciurus griseus*]) mammals and birds, and they also feed on carrion; in California, reptiles and insects are also notable components of the diet (Zielinski 2014).

Predation is probably the predominant cause of death, and fishers are regularly killed by cougars *(Puma concolor*), coyotes, and bobcats (Lofroth et al. 2010).

Between 1992 and 2004, no fishers were detected during survey efforts by Lassen National Forest personnel or systematic surveys conducted in 2002 by Pacific Southwest Research Station (PSW) (Zielinski et al. 2005). However, recent confirmed fisher detections have been recorded in the northwestern portion of the Hat Creek Ranger District. Zielinski et al. (2005) concluded that Lassen National Forest falls within an area considered a distribution gap within the range of the fisher. From late 2009 through late 2011, a total of 40 fishers were released onto the Stirling Management Area owned by Sierra Pacific Industries west of the Lassen National Forest. Radio-telemetry tracking and camera sets show that fishers from this introduced population ventured onto the extreme southern portion of the Lassen National Forest in 2012 and 2013, including known denning occurrences (Powell et al. 2014).

Habitat Status

Fishers occupy mid-elevation, multi-storied mature and old-growth conifer, mixed conifer and mixed-conifer hardwood forests with contiguous canopy cover. Closed canopies (over 50 percent) are typically selected, but fishers will use areas of low to moderate canopy cover (25 to 40 percent) if there is sufficient understory (Lofroth et al. 2010). They do not occur in high-elevation alpine or subalpine habitats.

Foraging habitat varies with primary prey species. Since fishers in California prey primarily on small to medium-sized mammals (woodrats, squirrels etc.) they will use forests with hardwood components which provide mast for prey, structurally complex structures near the forest floor (brushy understories) and high abundance of downed, woody debris (Lofroth et al. 2010).

Rest sites are strongly associated with moderate to dense forest canopy and elements of late-successional forests (Lofroth et al. 2010). Rest sites in northern California typically have more than 50 percent canopy cover and an average dbh of 30 to 45 inches for the 5 largest trees in the immediate area. These areas will often have a higher density of snags and large downed wood. Due to high temperatures, rest sites in this region often occur in the bottom of drainages or within 100 meters (328 feet) of water. Cavities, mistletoe blooms, branch deformities, and platforms in live trees and snags (conifers and hardwoods) are used for rest sites as well as logs, rock areas, brush piles, and concentrations of downed woody debris.

Cavities in live trees and snags are critical for reproduction. Females use cavities in a variety of tree species (Douglas-fir, ponderosa pine, black oak etc.), but live hardwoods appear to be particularly important in northern California. Most cavities used as natal and weaning dens are formed from heartwood decay and are in large (average 36 inches dbh) trees and snags. These trees are often much older than those available with Douglas-fir averaging 177 years (Lofroth et al. 2010).

Potential suitable habitat for the fisher occurs primarily on the lower-elevation steep slopes having an oak component typed as montane hardwood or montane hardwood-conifer habitat. As with marten habitat at the higher elevations, forest management practices and resulting roads have contributed to habitat fragmentation. Fishers generally avoid open areas with no overstory or shrub cover and roads associated with the presence of vehicles and humans. Fishers are known to modify their behavior near active roads (USDA Forest Service 2001).

Threats

Throughout the western United States, forest structure seems to be more important than tree species composition for within-home range fisher habitat selection. Both active (foraging) and inactive (resting and denning) fishers are associated with complex forest structure (i.e., understory vegetation, a diversity of tree sizes, and snags and other coarse woody debris). Fisher habitat can be fragmented or reduced in quality, at least temporarily, by disturbances that change forest structure and remove essential fisher habitat elements. Currently, large, severe wildfires, in concert with drought, climate change, and insect outbreaks, are considered the largest threat to fisher habitat. Vegetation management, including tree harvest and thinning to reduce wildfire risks, can also adversely affect fisher habitat, but this risk may be offset if vegetation treatments reduce the risk that large, severe wildfires will affect habitat over larger areas and longer periods (Spencer et al. 2015).

Fishers are long-lived, have low reproductive rates, large home ranges (for carnivores of their size) and exist in low densities throughout their range. This implies that fishers are highly prone to localized extirpation, colonizing ability is somewhat limited, and that populations are slow to recover from deleterious impacts. Isolated populations are therefore unlikely to persist. Habitat connectivity is a key to maintaining fisher within a landscape. Activities under Forest Service control that result in habitat fragmentation or population isolation pose a risk to the persistence of fishers. Timber harvest, fuels reduction treatments, and road construction may result in the loss of habitat connectivity resulting in a negative impact on fisher distribution and abundance (USDA Forest Service 2001). Fishers are known to generally avoid natural or human-created openings at the local level, and some populations appear to be isolated by past human actions that reduced available habitat at the landscape level (Buskirk and Powell 1994, Buskirk and Ruggiero 1994). Zielinski et al. (2005) attributed the reduction in fisher distribution in California to a combination of loss of mature forest habitat, residential development, and the latent effects of commercial trapping.

Vehicle collisions are identified as a substantial mortality factor in portions of the Sierra Nevada, especially where moderate to heavily traveled roads traverse high quality habitat. In addition, forest roads and trails may elevate fisher predation by mountain lions, bobcats, and coyotes using these trails as travel and hunting corridors (Spencer et al. 2015). Both bobcats and mountain lions have been noted as predominant predators of fishers (Wengert et al. 2014).

Other risk factors include rural or recreational development that may fragment habitat, increases in road density and traffic levels, and increases in human access to fisher habitat. Non-habitat based risk factors outside the control of the Forest Service include disease and climate change. Fishers are susceptible to both canine and feline distemper (USDA Forest Service 2001).

Direct and Indirect Effects

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to fisher are listed in table 149.

Table 149. Resource indicators and measures for assessing effects to Pacific fisher

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals, increased predation, or snow compaction impacting subnivean prey	Acres and percentage of suitable fisher habitat[13] impacted by OSV use	45,464 (29%)	43,515 (28%)	39,558 (25%)	45,244 (29%)	34,134 (22%)

The Pacific fisher is associated with late-successional forests that can be impacted by activities associated with trails. Gaines et al. (2003) conducted a literature review of 71 late-successional forest-associated wildlife species and identified negative effects on these species that can result from route-associated factors. These impacts include direct loss of habitat from type conversion, diminished quality of habitat attributes or fragmentation, and road avoidance or displacement resulting from direct harassment or noise disturbance. Individuals, environmental groups, and agency biologists have expressed growing concern over habitat fragmentation for late-successional forest-associated species. Various studies have shown that this species group is vulnerable to disturbance, changes in habitat, or displacement by habitat generalists.

As found in the Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004), habitat types important for late-successional forest include stands typed as 4M, 4D, 5M, 5D, and 6 by California Wildlife Habitat Relationship (CWHR), which are all stands of trees greater than 11 inches dbh with greater than 40 percent canopy cover. The Sierra Nevada Forest Plan Amendment provides management direction for Old Forest Emphasis Areas to maintain or develop old forest habitat in areas containing the best remaining large blocks or landscape concentrations of old forest. Direction also includes providing for old forest functions, such as connectivity of habitat over a range of elevations to allow migration of wide-ranging old-forest-associated species.

Snowmobile use within late-successional forest habitats can have the following potential direct effects to individuals or their habitat (Gaines et al. 2003): Disturbance and potential for injury or mortality to individuals from vehicle collisions.

Disturbance:

Displacement of populations or individual animals from a route, related to human activities.

Disturbance and displacement of individuals from breeding or rearing habitats.

Physiological response to disturbance, resulting in changes in heart rate or level of stress hormones.

Potential for Injury or Mortality to Individuals from Vehicle Collision:

As previously discussed, the likelihood of a collision between snow grooming equipment and wildlife is extremely low because the equipment travels slowly (3 to 6 mph). There is an increased

[13] Based on U.S. Fish and Wildlife Service (2016)

likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds. This effect would be most specific to mammals.

Potential indirect effects include:

Altered or dispersed movement as caused by a route or human activities on or near a route.

In addition, Gaines et al. (2003) found an interaction that occurred on winter recreation trails was the indirect effect of snow compaction on the subnivean sites used by small mammals in which small mammals can either be suffocated as a result of the compaction, or their subnivean movements can be altered owing to impenetrable compact snow. Adverse effects to subnivean animals could indirectly affect the prey base for many Forest Service sensitive species, including fisher.

Trails as routes for competitors and predators on packed trails resulting from snowmobile use facilitate coyote incursion into deep snow areas (Bunnell et al. 2006) and can negatively impact fisher or other mammal populations through increased competition or predation and that 90 percent of coyote movement was made within 1,150 feet of packed trails.

In contrast, Kolbe et al. (2007) reported from a study in western Montana that although roads and trails compacted by snowmobile use were readily available, only a small portion of coyote travel was on compacted snow surfaces. And, while coyotes did use compacted snow more than random expectation, it is unlikely that snowmobile trails strongly affected their movements. They found no difference in use of compacted or uncompacted forest roads, suggesting that coyotes may select for the clear corridor afforded by a road rather than the snow conditions on them. Whether or not increased predator use of existing trails is occurring or the extent to which it is occurring, as a result of OSV use and related activities on the Lassen National Forest, or whether or not it is impacting individual fishers or the fisher population, is unknown at this time. Predation, if occurring, would be predictably restricted to areas in the immediate vicinity of trails. The use of OSV trails and regular grooming is an existing condition that has been in operation for numerous years; and no new trail expansion is proposed at this time. Therefore, predator incursion, if occurring, would continue, but would not increase in size of area as a result of OSV program activities.

Based on CWHR (2014) habitat types, there are 155,139 acres of high-capability reproduction habitats for fisher on Lassen National Forest.

Areas on Lassen National Forest with a combination of fewer roads, higher canopy cover, and physical structure are typically more abundant in steep slopes and canyons on the Sierran portion of Lassen National Forest (e.g., North Fork Feather River) and Rock Creek/Screwdriver Creek, draining east off of Chalk Mountain into the Pit River west of Lake Britton.

Comparison of the Alternatives

Snow has been posited as limiting suitable fisher habitat and fisher distribution at higher elevations (Aubry and Houston 1992, Powell and Zielinski 1994, Weir et al. 2003, all cited in Lofroth et al. 2010). This is consistent with fisher studies elsewhere in North America indicating that some snow conditions may limit fishers because they are not efficient at traveling and hunting in terrain covered by soft deep snow. However, other factors associated with increasing elevation (e.g., lower forest productivity, changes in forest structure) may also limit fisher distribution through their influence on the abundance of structures critical for denning and resting, and abundance and availability of prey (Franklin and Dyrness 1988, Meidinger and Pojar 1991, McNab and Avers 1994, all cited in Lofroth et al. 2010). Composition or structure of suitable fisher habitat within the action area would not be physically modified under any of the alternatives.

Gaines et al. (2003) describe a number of potential direct and indirect effects of linear travel trails to fisher, but they identify increased vulnerability to trapping mortality as the single risk factor associated with winter recreation/snowmobiling trails. However, increased vulnerability is unlikely to be a risk factor under any alternative, because trapping of fisher is prohibited in California.

Fishers' tolerance of human presence and various activities appears to range from little effect resulting from moderate degrees of human activities to avoidance and displacement if disturbance occurs near den sites. Foraging behavior of mid-sized carnivores in forested areas may be disrupted along groomed trails and other travel corridors. Displacement or avoidance may occur due to noise of snow machines or to human presence. Snowmobile trails may facilitate travel for some carnivores, but compaction of snow from grooming or snowmobile use off existing roads or trails may adversely affect the subnivean habitat of prey species and, therefore, impact foraging opportunities for carnivores. Intentional killing of carnivores by a snowmobiler is possible, but most likely it would only occur in rare, isolated incidents (Olliff et al. 1999).

Although initially believed to be primarily nocturnal, more recent studies have reported that fishers tend to be crepuscular. Periods of activity are generally 2 to 5 hours long and are often separated by longer stretches (10 hours) of inactivity (Arthur and Krohn 1991; Kelly 1977; Powell 1993, all cited in Weir and Corbould 2007). As a result, fishers tend to be inactive during the time when OSV use on Lassen National Forest is highest. Therefore, the probability of mortality resulting from an accidental collision with a snowmobile would be quite low and the potential for mortality resulting from collision with snow grooming equipment would be even lower, given the slow speed at which the equipment moves.

High-value habitat acreages were derived from habitat modeling based on CWHR (2014) habitat types and value rankings. Gaines et al. (2003) suggest a human influence scale where less than 30 percent influence in high-value habitat is rated low, 30 to 50 percent influence is rated moderate, and greater than 50 percent influence is rated high. The trail-effect zone from noise and sight disturbance (200 meters; 656 feet) along designated groomed trails would affect 9,423 acres or 5.9 percent of existing high-value habitat acres (table 150), which, at 5.9 percent, is a very low human influence rating. Designated non-groomed trails under all alternatives would influence 2,160 acres (1.3 percent), which again is very low disturbance. In addition, trail densities under each of the alternatives are as follows: Alternative 1, 1.5 mi/m^2; Alternative 2, 0.2 mi/m^2; Alternative 3, 0.2 mi/m^2; Alternative 4, 0.2 mi/m^2; Alternative 5, 0.2 mi/m^2. The LRMP has recommended a 0 to less than 0.5 mi/m^2 (preferred) trail densities for fisher. Therefore, all of the action alternatives would be consistent with preferred LRMP road density recommendations and improve trail densities with respect to the existing condition for fisher. And because the majority of OSV use occurs on or within 0.5 mile of groomed trails and staging areas, or within meadows within 0.5 mile of designated trails, the potential for predator or competitor incursion into suitable fisher habitat, as well as the potential for impacts to subnivean prey species, would be expected to decline with reduced trail densities under alternatives 2, 3 4, and 5. The numbers in table 150 apply to designated trails only. Use of undesignated trails would be authorized only in areas designated for cross-country OSV use. Therefore, the effects of OSV use of undesignated trails areas designated for OSV use are discussed below.

Table 150. Acres of fisher high-value suitable habitat within 200 meters of designated groomed and designated non-groomed trails

Habitat	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Groomed Trail	9,423	9,423	9,423	9,423	9,423
Non-groomed Trail	2,160	2,160	2,160	2,160	2,160

Source: GIS query, 10/10/2015

Areas designated for cross-country OSV use vary among the alternatives.

Using a suitable fisher habitat model developed by the U.S. Fish and Wildlife Service (2016b), 156,606 acres of fisher habitat occur within Lassen National Forest System lands (table 151; map BE-21). Of those, 132,672 acres (85 percent) of habitat are currently open to OSV use (table 151). Intersecting suitable fisher habitat with areas of moderate to high OSV use (slopes less than or equal to 21 percent and canopy cover less than 70 percent) results in 45,464 acres of fisher habitat (29 percent) of moderate to high OSV use. The potential for OSV-related impacts to fisher (injury or mortality, noise-based disturbance, predation facilitated by OSV trails, impacts to subnivean prey species) would be most likely to occur within that 29 percent of suitable habitat). However, of that 29 percent of habitat, high OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use actually occurs within less than that 29 percent of fisher habitat and the majority of areas proposed to be designated for OSVs are not known to currently support fishers. Under alternative 2, 28 percent of suitable fisher habitat would be designated and have moderate to high OSV use (map BE-22). Similarly, 25 percent of suitable habitat would be designated and conductive to OSV under alternative 3 (map BE-23), 29 percent under alternative 4 (map BE-24), and 22 percent under alternative 5 (map BE-25). Ongoing inventory and monitoring would be used to evaluate habitat conditions and mitigations to retain suitable habitat would be implemented, where necessary. Similarly, as fisher den sites are found within the portion of the action area designated for OSV use, den sites with potential to be impacted would be monitored to determine whether disturbance is occurring and if changes in management, including a limited operating period around den sites, are necessary, thereby minimizing impacts to fisher. The potential for noise-based disturbance would largely overlap with roughly the first quarter of the March 1 through June 30 fisher breeding season under alternatives 1, 2, 3, and 5, and may extend through the first half of the breeding season under alternative 4.

Table 151. Acres of suitable fisher habitat with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	132,672	122,223	114,493	131,779	91,884
Not designated for OSV use	23,934	34,384	42,113	24,827	64,722
OSV use restricted to trails	NA	NA	4	NA	4
Total	156,606 acres				
Designated for OSV use and of moderate to high OSV use	45,464 (29%)	43,515 (27.8%)	39,558 (25.3%)	45,244 (28.9%)	34,134 (21.8%)
Not designated for OSV use and of moderate to high OSV use	2,612	4,561	8,518	2,832	13,942
Moderate to high OSV use and OSV use restricted to trails	NA	NA	3	NA	3
Total	48,076 acres				

Within areas designated for OSV cross-country use, use of existing roads other than groomed and ungroomed trails not designated is authorized. Use of these roads by OSVs is expected to be low where these occur more than 1.5 miles from a groomed OSV trail or more than 0.5 mile from a marked (not groomed) OSV trail (see Assumptions section), but density of these designated roads can be used to show relative permeability of areas for low OSV use among alternatives.

Density of roads within areas designated for OSV travel is highest (1.7 miles per square mile) under the existing condition (alternative 1) and alternative 4, and somewhat reduced under alternatives 2 and 3 (table 152). Under alternative 5 road densities drop to 1.2 mile per square mile overall with reductions shown for all areas, except Ashpan and Bogard, in comparison to the existing condition. Under alternative 5, no OSV use of existing roads is authorized for the Fall River and Shasta areas. Therefore, the project area as a whole would be most permeable to low levels of OSV use under alternatives 1 and 4, and least permeable under alternative 5.

Table 152. Road densities by area and alternative

OSV Area	Existing (Alternative 1)		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	Road Miles	Miles/ Sq.Mi.	Road Miles	Miles/ Sq.Mi.	Road Miles	Miles/ Sq.Mi.	Road Miles	Miles/ Sq.Mi.	Road Miles	Miles/ Sq.Mi.
Ashpan	217.0	1.4	217.0	1.4	212.8	1.4	217.0	1.4	212.8	1.4
Bogard	1104.1	2.0	1091.6	1.9	1090.4	0.2	1095.3	2.0	794.2	1.4
Fall River	139.8	2.1	130.5	1.9	57.2	0.9	139.8	2.1	0	0
Fredonyer	105.9	2.0	105.9	2.0	103.8	2.0	105.9	2.0	86.0	1.6
Jonesville	321.8	1.4	311.3	1.4	298.9	1.3	321.1	1.4	263.1	1.1
Morgan Summit	400.1	1.2	339.0	1.0	313.6	1.0	382.0	1.2	317.4	1.0
Shasta	91.8	1.0	91.8	1.0	85.6	0.9	91.8	1.0	0	0
Swain Mountain	613.1	2.0	605.7	2.0	452.8	1.5	613.1	2.0	410.8	1.4
Total by Alternative	2,993.6	1.7	2,892.7	1.6	2,615.1	1.5	2,966.0	1.7	2,084.4	1.2

Area Currently known to be Utilized and/or Occupied by Fisher

As stated above, fishers currently use portions of the project area as a result of movements from the population introduced onto Sierra Pacific Industries lands as well as recently detected individuals in the northwestern portion of the Hat Creek Ranger District. The dominant proportion of occurrences are concentrated within a total of 8 watersheds that contain approximately 245,220 acres of land administered by the Lassen National Forest. Under the existing condition (alternative 1) OSV use is restricted from use primarily within designated Wilderness areas on about 87,515 acres, leaving about 64 percent of the watersheds designated for OSVs (table 153). Additional restricted areas proposed under alternative 2 decrease OSV designated areas to about 58 percent of the watershed area. Alternative 5 proposes the most restricted area within the watersheds, leaving 42 percent of the area designated for OSVs. Alternative 4 would increase restricted area slightly (by 119 acres) in comparison to alternative 1. Additional areas, located in dense stands (70 percent or greater canopy closure) and on steeper terrain (greater than 20 percent slope) where conditions are likely to be of low OSV use, would further decrease fisher exposure to potential impacts. Acres and proportions of suitable habitat in areas designated and of moderate to high OSV use range from 19.3 percent under alternatives 1 and 4 to 15.5 percent under alternative 5 (table 153).

Increased vulnerability to trapping resulting from available access is not a risk factor for the species. Trapping of fishers is currently illegal in California.

Table 153. OSV designated area within fisher concentration areas

Habitat	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
OSV Designated Area (acres)	155,747	130,069	131,630	154,023	99,563
OSV Designated Area (percent of existing)	63.5	53.0	53.7	62.8	40.6
Total acres	245,220 acres				
Suitable Habitat Designated for OSV Use of moderate to high OSV Use (percent)	13,946 (19.3%)	12,959 (18.0%)	12,734 (17.8%)	13,926 19.3%)	11,194 (15.5%)
Total acres	72,118 acres				

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, vegetation management or fuels management projects are projected to occur within Lassen National Forest lands occupied, used, or suitable for use by fishers. These include timber harvest, fuels reduction, and associated activities, as well as road maintenance, firewood gathering, and special use activities. Vegetation management projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. Vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires. These projects can reduce stand densities and suitability for fisher. However, management prescriptions emphasize retention of large snags and logs, as well as large conifer that are attributes of fisher habitat. In addition, seasonal limited operating periods required for known fisher den sites for vegetation projects prevent disturbance to breeding individuals. Use of roads within fisher habitats for public and administrative access contributes a level of disturbance during a portion of the breeding season. This is incorporated into the environmental baseline for disturbance. Timber harvest and State and private lands within one-quarter mile of fisher habitats may impact habitat availability

outside NFS lands and may increase disturbance locally. In summary, ongoing and reasonably foreseeable actions may be additive locally, but are not expected to contribute substantial impacts to effects discussed for this project under any alternative.

Determination Statement

Alternatives 2, 3, 4, and 5 would have a low level of risk to existing and future introduced fisher. Therefore, alternatives 1, 2, 3, 4, and 5 of the Lassen National Forest Over-snow Vehicle Use Designation Project may affect individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for fisher in the project area based on the following rationale:

- Vegetative structure of fisher habitat would not be physically modified by OSV use and related activities under any of the alternatives.
- Although the potential for noise-based disturbance to individuals within suitable habitat ranges from 22 to 29 percent under all of the alternatives, the percentage of suitable fisher habitat impacted would actually be lower, considering that the concentration of OSV use is not equal across the landscape. In addition, the forest would use the results of ongoing inventory and monitoring to determine whether disturbance is occurring and if changes in management, including application of a limited operating period around den sites, are necessary, thereby minimizing impacts to fisher.
- OSV use is unlikely to influence foraging because fishers tend to be crepuscular when OSV use is low to non-existent on the Lassen National Forest.
- Improved (i.e., reduced) trail densities, under alternatives 2, 3, 4 and 5, that would be consistent with LRMP preferred trail densities for fisher are likely to reduce the potential for predator or competitor incursion into suitable fisher habitat, as well as the potential for impacts to subnivean prey species.

Potential for direct impacts to fisher from collisions with OSVs is very low.

Pacific Marten (*Martes caurina*)

Regional Foresters Sensitive Species

Species Account

The Pacific marten (*Martes caurina*) is a Region 5 Forest Service sensitive species and a management indicator species for the late seral, closed canopy coniferous forest habitat component. Additional information for the marten is provided in the Management Indicator Species section. This species was previously classified as American marten (*Martes americana)*, but recent genetic and morphological evidence led to a reclassification as Pacific marten (*Martes caurina*) (NatureServe 2017).

Females give birth in March or April (Zielinski, pers. comm., 2015). Home ranges of Pacific martens in the Sierra Nevada average 300 to 500 hectares (740 to 1,235 acres) for males and 300 to 400 hectares (740 to 990 acres) for females (Spencer et al. 1983). The diet of the marten in the Sierra changes with season, as does the time of day that martens search for particular prey; winter prey is primarily Douglas squirrel (*Tamiasciurus douglasii*), snowshoe hare, voles (*Microtus* sp.), and flying squirrels (*Glaucomys sabrinus*) (Zielinski 2014).

Martens have relatively low foot loading, which allows them to move relatively easily over deep, soft snow, and they are adept at using subnivean environments for foraging and resting. This gives martens a competitive advantage over larger carnivores that may otherwise compete with or prey on

martens, such as bobcats (*Lynx rufus*), coyotes (*Canis latrans*), and fishers, whose distributions are limited by deep, soft snow (Zielinski 2014).

There are numerous marten detections documented on the Lassen National Forest, primarily in three areas of concentration. The largest concentration of observations, in the Swain Mountain Experimental Forest area, is likely the result of unequal survey effort (i.e., greater in the Swain Mountain Experimental Forest) as part of a research project. Smaller concentrations occur in the Humboldt Peak area and on NFS lands adjacent to the Latour State Forest. Systematic surveys conducted by the Pacific Southwest Research Station suggest that persistent marten occurrences are primarily associated with late-successional habitats in and near Lassen Volcanic National Park (Zielinski et al. 2005). Based upon the available information, there are known marten den sites on the Almanor Ranger District. To address deficiencies in marten den site knowledge, the Lassen National Forest has funded a study by the Pacific Northwest Research Station to locate natal and maternal dens and to model den site selection (Zielinski, pers. comm., 2015). Young disperse during late fall and winter (Zielinski et al. 2015).

Habitat Status

Marten prefers coniferous forest habitat with large-diameter trees and snags, large down logs, moderate-to-high overstory tree canopy, and an interspersion of riparian areas and meadows. Important habitat attributes are: vegetative diversity, with predominately mature forest; snags; dispersal cover; and large woody debris (Allen 1987). Spencer et al. (1983) found that martens select stands with 40 to 60 percent overstory tree canopy for both resting and foraging, and avoided stands with less than 30 percent overstory tree canopy. Martens generally avoid habitats that lack overhead cover, presumably because these areas do not provide protection from predators (Buskirk and Powell 1994, Spencer et al. 1983).

In the Sierra Nevada, this species is known to inhabit high-elevation (4,500 to 10,500 feet) late-successional, mature red fir and lodgepole pine forests with large, decadent live trees and snags, and complex physical structure near the ground composed of an abundance of large dead and downed wood (Buskirk and Powell 1994 *in* Ruggiero et al. 1998, Zielinski 2014). Martens can inhabit younger forests if important elements of the mature forest are still present, especially structures for resting and denning (Purcell et al. 2012, Zielinski 2014). Riparian areas, especially near mature forest, are important for foraging (Zielinski 2014). The abundant large trees and dead-wood structures associated with marten presence provide prey resources, resting structures, and escape cover (Zielinski 2014). Rest structures typically include snags, logs, and stumps; trees and snags used for resting are often the largest available (over 35 inches in diameter) (Purcell et al. 2012). Rest structures vary with season; above-ground cavities are used in summer, and subnivean logs, snags, and stumps are used during the winter (Zielinski 2013). Den structures typically include arboreal cavities in live trees, snags (Gilbert et al. 1997, Raphael and Jones 1997, Bull and Heater 2000) and logs, rock crevices and red squirrel middens (Ruggiero et al. 1998). Resting and denning structures may be the most limiting resource for marten on the landscape, because this species uses multiple structures within their ranges (Purcell et al. 2012).

Two marten dens were positively identified in the Lake Tahoe basin with a third possible. All known or possible dens were discovered opportunistically in 2009 and 2012, and are predominantly on the western and southern portion of the basin. One den that was positively identified in 2012 is located at an elevation of approximately 6,650 feet and within the CWHR Jeffrey Pine type, class 5M. The den identified in 2009 is at approximately 6,560 feet elevation and within the CWHR Sierra Mixed Conifer type, class 4M. Moriarty (2011) indicates that various 4M habitat types (lodgepole pine,

montane riparian, red fir, subalpine conifer, and white fir) are considered “high quality habitat” for marten. CWHR also classifies some 4M habitat as high quality denning habitat for marten.

Threats facing martens include habitat loss and fragmentation, especially clear-cutting, fuel reduction treatments, and wildfire (Zielinski 2014). Marten are very sensitive to habitat loss and fragmentation and rarely occupy landscapes after more than 30 percent of the mature forest is harvested (Zielinski 2014). Martens tend to avoid clearcut openings or will cross only small openings (e.g., less than 500 feet). However, martens were more likely to cross openings in the Rocky Mountains that have some structure retained (e.g., isolated trees, snags, logs), even if the openings were relatively large (maximum distance = 600 feet), than if the opening had no structures and were small (summarized in Zielinski 2014). Females tend to be more specialized than males in their habitat needs, and tend to avoid managed areas of lesser habitat value and greater predation risk (summarized in Zielinski 2013).

The effect of thinning treatments (including fuel reduction treatments) on marten in the Sierra Nevada is currently being studied. The effects can be positive and negative for marten; positive if treatments set the trajectory toward historical conditions while retaining key habitat features (e.g., snags, large and complex trees, coarse woody debris), and if unsuitable stands are treated to accelerate the recruitment of mature forest characteristics and reduce the chance of catastrophic wildfire (Slauson et al. 2008). Effects can be negative if the treated habitat increases the risk of predation by reducing canopy cover significantly, removing resting and denning structures and escape cover (e.g., tree boles), and/or reducing the complexity of the understory (clearcutting from below). Treatment effects can also be negative if habitat patches require a lot of energy and risk to travel between (increased fragmentation), if treatment has adversely affected prey resources, and if den structures are reduced or altered in a way that reduces the survival of young (Slauson et al. 2008).

According to Zielinski (2013), there is a need to understand the tradeoff between treating stands to reduce fuel loadings and loss of the stand to catastrophic wildfire. Purcell et al. (2012) suggest that research findings support the validity of recommendations made in North et al. (2009) to treat habitat for marten in areas where historically, fire would have burned less frequently, such as north-facing slopes, canyon bottoms, and riparian areas. Regardless, the type and timing of treatments as well as home range and landscape-level effects from treatments should be carefully evaluated to understand the short- and long-term outcomes.

In addition to vegetation management, marten are also sensitive to recreation activities, particularly snow activities (e.g., ski facilities). Much of the information presented on marten and ski resorts comes directly from Zielinski (2013). Ski resorts are considered likely to affect marten populations because they remove and fragment high-elevation fir forest habitat. The operation of ski resorts includes the continued compaction of snow, presence of high densities of skiers, and nocturnal grooming activities. These factors can have negative effects on marten both directly (females may avoid these areas) or indirectly (snow compaction and forest fragmentation facilitate high predation by coyotes) (Slauson et al. 2008). Ski resorts are considered likely to affect marten populations because they remove and fragment high-elevation fir forest habitat. To create ski runs, chair lifts, and associated facilities, trees are removed, creating open areas and fragmenting forest. Skiers and staff are active during the day, and grooming and some skiing activity occur during the night. Thus, martens that are sensitive to these activities may not find time for important foraging activities. Ski resort effects are not limited to winter, as habitat fragmentation is a year-round effect and many resorts are developing summer recreational activities (e.g., hiking, mountain biking).

There are approximately 25 ski resorts in the Sierra Nevada, and nearly all occur within the range of the marten (Zielinski 2013). The Lake Tahoe region includes approximately half of these resorts (not all found on the Lake Tahoe Basin Management Unit), constituting the highest density of resorts in the Sierra Nevada and one of the highest in North America (Zielinski 2013).

Other snow activities may affect marten, but data from the Lake Tahoe Basin Management Unit indicate that OHV/OSV use did not affect marten occupancy or probability of detection and that overall OHV/OSV use in the study areas was low (1 OHV/OSV pass every 2 hours) and exposure occurred in less than 20 percent of a typical home range (Zielinski et al. 2007).

Historically, martens were understood to be well distributed throughout the Cascades and northern Sierra Nevada, but recent surveys suggest that the populations are now fragmented, distribution is reduced, and suitable habitat has also been reduced and isolated in parts of the range (Zielinski et al. 2005, Kirk and Zielinski 2009, Spencer and Rustigian-Romsos 2012). In a study of marten in northeastern California, Kirk and Zielinski (2009) reported that marten populations detected are associated with areas that contain the largest amount of reproductive habitat consisting of mature, old forest. The highest density of detections was located in the largest protected area in the study region. Moriarty (2011) reported approximately 60 percent fewer detections of marten at Sagehen Experimental Forest on the Tahoe National Forest than those in the 1980s. These results, although on a smaller spatial scale, are similar to those reported by Kirk and Zielinski (2009). Although the cause of the decreased detections is unclear, Moriarty (2011) hypothesized that this was associated with loss and fragmentation of habitat; during the same period 39 percent of forested areas at Sagehen Experimental Forest experienced some form of timber harvest (11 percent clearcut or shelterwood and 28 percent salvage). Habitat and occupancy models developed by Rustigian-Romsos and Spencer (2010) indicate that habitat connectivity for marten is fragmented north of the Plumas National Forest, where martens appear to be restricted to isolated or semi-isolated high-elevation areas (consistent with Kirk and Zielinski (2009)), whereas south of the Plumas, habitat connectivity does not appear to be greatly limiting for martens, although the authors suggest that Interstate 80 may be a significant barrier to movement.

Marten predictive denning habitat models are currently lacking (B. Zielinski, pers. comm. 2015). In 2010, the Lassen National Forest contracted with Conservation Biology Institute to develop a habitat suitability model for marten on the Lassen to assist with project planning. Three models of habitat suitability were developed based on season-specific marten survey data for summer, winter, and year-round (Rustigian-Romsos and Spencer 2010). The summer model predicted high probability of marten occurrence within Lassen Volcanic National Park and the Caribou Wilderness as well as areas on the Lassen that were adjacent to those two areas. In addition, one small area of high-probability habitat was located in the Thousand Lakes Wilderness, and a yet-smaller area on Burney Mountain. A large area of mostly moderate probability was located in the southern portion of the forest. The winter model predicted a distribution of marten occupancy similar to the summer model, but with significantly more area predicted to have high probability of occupancy (nearly four times as much suitable habitat using 50 percent probability of occupancy to define suitable habitat). The winter model was used, solely, for this analysis because OSV use occurs solely within the winter. Summer habitat is likely the most limiting to the marten population because it is much less extensive than habitats occupied during the winter and supports adults during the breeding season (Rustigian-Romsos and Spencer 2010); OSV use and associated activities do no impact reproductive habitat structure. There are 122,473 acres of suitable marten winter habitat on NFS lands within the Lassen National Forest boundary (table 155, page 475; map BE-26).

Functional habitat connectivity for martens on the Lassen national Forest has been assessed using GIS cost-distance and least-cost corridor modeling (Kirk and Zielinski 2010). This effort involved two primary steps. First, the landscape was modeled as a permeability surface, which described the relative costs to dispersing martens for moving across each linkage from known source and destination locations. Resistance costs were assigned to different landscape features, primarily vegetation types, which allow behavioral responses to unsuitable habitat to be modeled in a biologically realistic manner. Landcover was considered the primary influence on animal movements. Second, least-cost algorithms were used to determine the least-cost movement corridors, using the "corridor" function, and least-cost path, using the "costdistance" function (see Kirk and Zielinski 2010 for a full description). Dispersal corridors calculated using the "costdistance" and "corridor" functions mapped every possible movement pathway across the landscapes defined by each linkage. Corridors with the lowest total resistance costs were assumed to be the most essential for successful movement. Corridors that depicted the most likely dispersal routes, the top 10 percent and 25 percent, respectively, were extracted from the model. The top 10 percent corridors were generally within the middle of the wider 25 percent corridors. For this analysis, the 25 percent corridors model was used to assess the potential for impact to marten functional habitat connectivity. There are 187,240 acres of 25 percent corridors on NFS lands within the Lassen National Forest boundary (table 155, page 475; map BE-31).

Threats

Threats facing martens include habitat loss and fragmentation, especially clearcutting, fuel reduction treatments, and wildfire (Zielinski 2014). Marten are also sensitive to recreation activities, particularly snow activities (e.g., ski facilities). In addition, marten occupancy and geographic range is predicted to be influenced by climate change such that the species will be highly sensitive to climate change, and would probably experience the largest climate impacts at the southernmost latitudes (i.e., in the southern Sierra Nevada) (Lawler et al. 2012). Moriarty (2014) and Moriarty et al. (2015) predicted future decreases in functional winter connectivity for martens based on estimates from Klos et al. (2014) that winter snowpack within the study area would decrease by more than 30 percent. Manlick et al. (2017) and Zielinski et al. (2017) indicate that reductions in snow cover could increase spatial overlap between fisher and marten, thereby favoring fisher expansion and increasing interspecies competition as well as risk of marten to predation by fishers. Zielinski et al. (2017) stated that, given climate change predictions of increases in minimum temperatures and decreases snowpack by the end of the 21st century, the southern edge of marten habitat suitability will move north and marten will experience more conditions that appear to fall outside their thresholds for occurrence in the southern Sierra Nevada.

Direct and Indirect Effects

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to marten are listed in table 154.

Table 154. Resource indicators and measures for assessing effects to marten

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals, increased competition or predation due to habitat modification, or snow compaction effects to foraging or denning individuals	Acres and percentage of suitable habitat impacted by OSV use	29,290 (24%)	28,220 (23%)	25,786 (21%)	27,581 (23%)	24,593 (20%)
Potential for loss of habitat connectivity	Acres and percentage of connectivity corridors impacted by OSV use	71,494 (38%)	70,252 (38%)	64,448 (34%)	70,987 (38%)	57,820 (31%)

Marten associated with late-successional forests can be impacted by activities associated with trails. Gaines et al. (2003) conducted a literature review of 71 late-successional forest-associated wildlife species and identified negative effects on these species that can result from route-associated factors. These impacts include direct loss of habitat from type conversion, diminished quality of habitat attributes or fragmentation, and road avoidance or displacement resulting from direct harassment or noise disturbance. Individuals, environmental groups, and agency biologists have expressed growing concern over habitat fragmentation for late-successional forest-associated species. Various studies have shown that this species group is vulnerable to disturbance, changes in habitat, or displacement by habitat generalists.

The most common interactions between snowmobile trails and wildlife that Gaines et al. (2003) documented from the literature included trapping as facilitated by winter human access, disturbance-based displacement and avoidance,[14] and disturbance at a specific site,[15] usually wintering areas. To a lesser degree, hunting, trapping, poaching, collection, and habitat loss and fragmentation were other interactions identified. Trapping of marten, or any of the special-status species under consideration, is not legal in California and, therefore, will not be considered as a potential impact in this analysis.

Snowmobile use within late-successional forest habitats can have the following potential direct effects to individuals or their habitat (Gaines et al. 2003): Disturbance and potential for injury or mortality to individuals from vehicle collisions.

Disturbance:

Displacement of populations or individual animals from a route, related to human activities.

Disturbance and displacement of individuals from breeding or rearing habitats.

Physiological response to disturbance, resulting in changes in heart rate or level of stress hormones.

[14] Spatial shifts in populations or individual animals away from human activities on or near roads, trails, or networks
[15] Displacement of individual animals from a specific location that is being used for reproduction and rearing of young

Potential for Injury or Mortality to Individuals from Vehicle Collision:

As previously discussed, the likelihood of a collision between snow grooming equipment and wildlife is extremely low because the equipment travels slowly (3 to 6 mph). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds.

Possible indirect effects include:

- Altered or dispersed movement as caused by a route or human activities on or near a route.
- Creation of a vector pathway for competitors or predators.
- Snow compaction impacts to den sites or subnivean prey.

In addition to the roads and trails themselves and associated infrastructure, human use of the trails and roads for dispersed recreation activities (e.g., driving, hiking, mountain biking, OHV and OSV use) can lead to direct mortality and injury in the form of vehicle strikes; temporary and permanent displacement of wildlife; alteration of normal behavior and activities by wildlife species (e.g., foraging, nesting, denning, etc.); and spread of noxious weeds. Prolonged or consistent use of trails and roads can lead to permanent displacement of individuals from territories, nest or den abandonment, and/or alteration of foraging behavior and species-specific effects can lead to community-wide effects. Higher trophic level species, such as marten, may be particularly vulnerable to disturbances from dispersed recreation activities (Manley et al. 2004). OSV use does not modify vegetative composition or structure.

Disturbance

As OSV trail use is an existing condition, animals that occur in the areas affected by OSV use during winter may be habituated to OSV disturbance or may have already modified their behavior to avoid areas adjacent to trails or OSV noise resonating in the forest may cause an alert or startle response in individual animals or may be accepted as ambient noise conditions of the environment as suggested by the study on martens (Zielinski et al. 2007). Although Zielinski et al. (2007), in investigating the response of marten to OHV and OSV-related disturbance in the Sierra Nevada Mountains in California, did not demonstrate an effect of OHV/OSV use on marten occupancy, probability of detection, sex ratio, or activity patterns, the study did not measure behavioral, physiological, or demographic responses, so it is possible that OHV/OSVs may have effects, alone or in concert with other threats (e.g., timber harvest) that were not quantified in this study. However, those types of responses would be expected to affect individuals rather than the population as a whole.

In analyzing models of least-cost corridor movement for marten, Spencer and Rustigian-Romsos (2012) identified roads as a variable that may affect marten movements or risks during dispersal. The roads included in the model consisted of interstate highways as well as primary, secondary, and local roads. NFS roads (see figures 2, 3, and 4 in Spencer and Rustigian-Romsos 2012) or areas of varying system road densities do not appear to have warranted inclusion in the models as factors contributing to environmental resistance to marten movement in their study, nor were OSV trail systems or areas designated for OSV cross-country use. A query of the Lassen NRIS database for the period 1992 to 2010 shows a total of 77 marten sightings within projected OSV high-use areas (i.e., within 0.5 mile of groomed trails) during the grooming period (December 26 through March 31). This indicates that, while some effect to marten may be occurring due to OSV disturbance, individuals are not completely avoiding high-use areas. Given the information above, it is unlikely that existing groomed trail systems and areas designated for OSV areas preclude marten movement through the least-cost corridor modeled by Spencer and Rustigian-Romsos. In addition, marten movements and

dispersal is unaffected by OSVs during the late spring, summer, and fall periods outside the period of OSV use.

Potential for Injury or Mortality to Individuals from Vehicle Collision

Although there is an greater likelihood of collision of individual martens with OSVs than trail grooming equipment due to higher frequency of OSV use and higher speeds, OSV use occurs in more open areas (canopy cover less than 70 percent) and martens generally avoid habitats that lack overhead cover (canopy cover less than 30 percent), such as trails and meadows, where OSV use would most pronounced. Presumably, a marten would hear an OSV and flee prior to injury or collision.

Competition and Predation

In the winter, OSV use compacts snow and some predators may use compacted snow for travel, changing the spatial pattern of their movements and predation (Manley et al. 2004). Buskirk and Powell (1994) documented predation on marten by coyotes, red foxes, and great-horned owls. Roads driven during the winter months provide travel corridors for coyotes to enter marten winter habitat, affecting marten through competition or direct predation. Since marten have unique morphology that allows them to occupy deep snow habitats where they have a competitive advantage over carnivores, such as coyotes and bobcats, human modifications of this habitat, such as winter road use, over-the-snow travel, and snowmobile trails, can eliminate this advantage and increase access for predators and competitors. Perrine et al. (2010) reported in the Sierra Nevada red fox conservation assessment that coyotes appear to be expanding their winter season range and identified this as a risk factor to the endemic red fox, needing further investigation. However, the recent species report (USDI Fish and Wildlife Service 2015b) noted there isn't any information to indicate that coyotes are increasing at any of the Sierra Nevada red fox sighting areas; red fox sighting areas largely overlap with marten observation areas. It is unknown if or how much competition with or predation on martens by coyotes is occurring on the Lassen National Forest as the result of OSV-related snow compaction or other OSV-related activities.

Snow Compaction Effects to Denning Individuals or Subnivean Prey

Martens access subnivean space beneath the snow to prey on subnivean species and use a variety of structures including rock crevices, for maternal den sites. Potential impacts of OSV use on marten den sites are unknown at this time, but could be an issue, given the overlap between marten whelping (March/April) season and the OSV use season, and the potential for compaction of subnivean habitat where some natal and maternal dens may be found (B. Zielinski, pers. comm. 2015). There currently are documented marten den sites on the Lassen National Forest. As den sites are located, Sierra Nevada Forest Plan Amendment standards and guidelines designed to protect marten den sites[16] would apply. OSV-related impacts to marten dens that consist of underground squirrel middens, snags, or logs for denning sites would be expected to be minor and primarily noise disturbance-based due to their structure. Rock crevice-based dens could be subject to a greater degree of impact if the rocks are small enough to compact under the weight of an OSV, in which case they could lead to crushing of or burying individuals.

Although OSV use or related activities would not physically alter the vegetative composition or structure of marten habitat, martens or their prey species could be subject to OSV-related impacts from snow compaction, including suffocation or alteration of movement while foraging in the

[16] "Mitigate impacts where there is documented evidence of disturbance to the den site from existing recreations, off-highway vehicle routes, trail, and road uses (including road maintenance). Evaluate proposals for new roads, trails, off-highway vehicle routes, and recreational and other developments for their potential to disturb den sites."

subnivean space beneath the snow. In addition, some small mammals (i.e., voles) may have difficulty navigating through compact snow layers (Manley et al. 2004).

Other Potential Indirect Effects

Slauson et al. (2017, pg. 901, 902) identified the potential for ski areas to become population sinks for marten based primarily on the potential increase in marten exposure to predation mortality due to frequently crossing wide (greater than 59 feet for males, and 43 feet for females) openings in the form of ski runs, in combination with the pulse stressor of human activity within the ski area. Ski area operations (including runs and resort areas) in the Slauson et al. study encompassed 50-65 percent of individual study areas. Avoidance of ski run crossings by marten was also difficult or impossible because the openings ran long distances generally from summit to base of the mountains (Slauson et al. 2017; pg. 896, Figure 2).

In contrast, groomed and ungroomed OSV trails in the project area occur on NFS roads with prism widths averaging approximately 12 to 15 feet, which presents a much lower risk of exposure to predation in comparison. A total of 5 OSV plowed parking areas located in existing openings along existing roads are scattered within the project area. These total 23 acres representing 0.002 percent of total project area acres. Parking areas range in size from 2 to 8 acres with maximum width of openings ranging from 498 to 912 feet. While it is likely that marten would avoid crossing these 5 areas, they would do so with or without OSV use due to the existence of the opening. In addition, these openings are small in size and sparse on the landscape, thereby posing a minor barrier to a mobile carnivore such as marten, and circumvention of these openings by individual marten is very unlikely to add a substantial energy expenditure burden to the population. Therefore, due to the dissimilarities between study area conditions reported by Slauson et al. (2017) and conditions existing or proposed in this project, it is unlikely that their findings of source-sink risk to marten caused by ski area conditions apply to the Lassen OSV project.

Comparison of the Alternatives

Although we don’t know where, specifically, impacts would occur at any given time and we cannot quantify the amount of impact, we know the potential for impacts would be greatest in areas of high OSV use. As described in the assumptions section, flatter areas with slopes less than 21 percent and canopy cover less than 70 percent, including the trails and staging areas, themselves, are used by OSVs more than others and, therefore, likely to receive the highest use. Those assumptions have been incorporated into the following analysis.

Based upon the information displayed in table 155, 81 percent of marten winter habitat is currently designated for OSV use (alternative 1). However, only 24 percent is designated for OSV use and of moderate to high OSV use (table 155; map BE-26). The potential for OSV-related noise-based disturbance, injury or mortality, competition or predation, or snow compaction effects (den sites or subnivean prey) impacting individual martens would be most likely to occur within that 24 percent of winter habitat. The amount of marten winter habitat designated for OSV use under the remaining alternatives is decreased somewhat in comparison to alternative 1: alternative 2, 23 percent (map BE-27); alternative 3, 21 percent (map BE-28), alternative 4, 23 percent (map BE-29); and alternative 5, 20 percent (map BE-30).

Table 155. Acres of marten winter habitat[17] with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	74,242	68,709	64,299	68,687	56,410
Not Designated for OSV use	48,231	53,764	57,578	53,786	66,063
OSV use restricted to trails	NA	NA	2	NA	2
Total	122,473 acres				
Designated for OSV use and of moderate to high OSV use	29,290 (23.9%)	28,220 (23.0%)	25,786 (21.1%)	27,581 (22.5%)	24,595 (20.0%)
Not Designated for OSV use and of moderate to high OSV use	22,734	23,804	26,238	24,443	27,430
Moderate to high OSV use and OSV use restricted to trails	NA	NA	1	NA	1
Total	52,024 acres				

Marten whelping season (March – April) overlaps with the latter portion of the OSV season. Although den sites occurring within the subnivean space could be physically impacted, the forest would use the results of natal and maternal den research to determine whether disturbance is occurring and if changes in management are necessary. As previously described, once OSV trail grooming season ends on March 31, trail use declines by roughly 50 percent and, therefore, the potential for direct and indirect effects to marten dens is expected to be low.

Of the modeled marten connectivity habitat (i.e., dispersal corridors) on the Lassen National Forest, 84 percent are currently designated for OSV use (table 156). However, 38 percent is designated for OSV use and of moderate to high OSV use (map BE-31). Of that 38 percent of habitat, high OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 miles of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within less than 38 percent of marten habitat. This would be slightly less under alternatives 2 and 4 (maps BE-32 and BE 34). There is some decrease in the amount of marten connectivity habitat that would be designated for and of moderate to high OSV use under four alternatives 3 and 5 [34 percent under alternative 3 (map BE-33), and 31 percent under alternative 5 (map BE-35], with alternative 5 having the least impact on marten connectivity habitat overall.

Several marten observations that were concentrated in a 200-acre area fell outside of either the Conservation Biology Institute Marten Habitat Suitability Model or the Least Cost 25 percent Corridor Model. Although the individual occurrences are based upon all available observational data, regardless of time of year, we created a polygon to determine how much of the area falls within areas of moderate to high OSV use; 54 percent of the polygon area is of moderate to high OSV use under all of the alternatives (maps BE-26, BE-27, BE-28, BE-29, and BE-30). Impacts to individual marten or marten dens would be expected to be similar, as previously discussed for winter habitat in general, and similar management actions would be taken as den sites are identified.

[17] Rustigian-Romsos and Spencer (2010) Conservation Biology Institute Marten Habitat Suitability Model

Table 156. Acres of marten habitat connectivity corridors[18] with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	156,995	152,117	143,174	156,264	122,059
Not Designated for OSV use	30,245	35,123	44,066	30,976	65.151
OSV use restricted to trails	NA	NA	0	NA	0
Total	187,240 acres				
Designated for OSV use and of moderate to high OSV use (percent of connected habitat)	71,494 (38.2%)	70,252 (37.5%)	64,448 (34.4%)	70,987 (37.9%)	58,820 (31.4%)
Not Designated for OSV use and of moderate to high OSV use	10,402	11,588	17,395	10,857	22,908
Moderate to high OSV use and OSV use restricted to trails	NA	NA	0	NA	0
Total	81,896 acres				

It is unknown if OSV use or related activities on the Lassen National Forest is negatively impacting marten using winter habitat or connectivity habitat. As previously noted, data from the Lake Tahoe Basin Management Unit indicate that OHV/OSV use did not affect marten occupancy or probability of detection when overall OHV/OSV use in the study areas was low (1 OHV/OSV pass every 2 hours; Zielinski et al. 2007). High OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, and moderate use occurs within 0.5 mile of marked trails and in areas between 0.5 and 1.5 miles of groomed trails. Therefore, the majority of OSV use occurs would occur within less than 20 to 24 percent of marten winter habitat or 31 to 38 percent of connectivity habitat. Similar to the results of natal and maternal den research, the results of other types of research, as it becomes available, would be used to determine whether disturbance is occurring and if changes in management are necessary

Under all of the action alternatives (i.e., alternatives 2, 3, 4, and 5), trail densities would decline from 1.5 mi/m^2 to 0.2 mi/m^2. And, because the majority of OSV use occurs on or within 0.5 mile of groomed trails and staging areas, or within meadows within 0.5 mile of designated trails, the potential for impacts to subnivean prey species, would be expected to decline with reduced trail densities under alternatives 2, 3, 4, and 5.

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, actions that could result in a cumulative impact to marten, when combined with alternatives 1, 2, 3, 4, or 5 include vegetation management projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. Vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires. These projects

[18] Least Cost 25% Corridor Modeling (Kirk and Zielinski 2010)

can reduce stand densities and suitability for marten. However, management prescriptions emphasize retention of large snags and logs, as well as large conifer that are attributes of marten habitat. In addition, seasonal limited operating periods required for marten for vegetation projects prevent disturbance to known den sites.

Marten habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. However, because wheeled motorized vehicles may not be used off of authorized NFS roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014), there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1 and December 31) and OSV trail grooming season (beginning December 26), and disturbance or displacement from this activity would occur outside of the marten breeding season under alternatives 1, 2, 3, and 5. Under alternative 4, in which trail grooming would begin at the discretion of the groomer, there is the potential for a somewhat larger degree of overlap during years in which heavy snowfall begins early. Use of roads within marten habitats after the March 31 termination date of the forest order closing roads for exclusive OSV use could contribute additional disturbance during the early part of the denning season, but the potential for impact would be expected to be localized.

In general, most non-motorized winter recreation occurs along designated trails, where individuals would either avoid a specific area, if too great a disturbance, or habituate to the noise. Similar activities on State and private lands within the Forest boundary may impact habitat availability outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown; State and privately held lands make up about 20 percent of the area within the forest boundary. In summary, ongoing and reasonably foreseeable actions may be additive locally, but are not expected to contribute significant impacts to those discussed for marten for the project under any of the alternatives. In addition, seasonal limited operating periods that prevent disturbance to marten denning sites would be used to minimize disturbance to these sites once they are identified.

Marten occupancy, geographic range, habitat connectivity, and interactions with competitors and predators is predicted to be influenced by climate change (Moriarty 2014; Moriarty et al. 2015, Manlick et al. 2017, and Zielinski et al. 2017). Moriarty et al. (2015) suggest addressing the potential impacts of future climate change on marten habitat connectivity by maintaining adequate suitable habitats in the form of structurally diverse forested stands. None of the alternatives proposed under this project would physically alter elements that define forest structure suitable for marten use (e.g., tree densities, canopy cover, and near-ground complexity). Therefore, while spatial overlap between areas used by OSVs and those used by marten may show future shifts, particularly in response to available snow levels. The continued use by OSVs would not alter trajectories of habitat and resource availability.

Determination Statement

Alternatives 1, 2, 3, 4, and 5 of the Lassen National Forest Over-snow Vehicle Use Designation Project may affect individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for marten in the project area based on the following rationale:

- Vegetative structure or composition of marten habitat would not be physically modified by OSV use and related activities under any of the alternatives.
- Although the potential for impacts to individuals within winter habitat ranges from 20 to 24 percent under all of the alternatives, and connectivity habitat ranges from 31 percent under

alternative 5 to 38 percent under alternatives 1 and 4, it is unknown if OSV use or related activities on the Lassen National Forest are negatively impacting marten using winter habitat or connectivity habitat, and the percentage of winter habitat and connectivity habitat impacted by OSV use would actually be lower considering that the concentration of OSV use is not equal across the landscape, with the highest use occurring on or within 0.5 miles of groomed trails and staging areas. Available research suggests that OHV/OSV use did not affect marten occupancy or probability of detection when overall OHV/OSV use in the study areas was low.

- Martens tend to avoid the open areas where the majority of OSV use occurs, so the potential for disturbance or collisions is expected to be low under all alternatives.
- Den sites in above-ground structures (trees, snags) would not be physically impacted due to the types of structures that are used.
- Marten whelping season (March – April) overlaps with the latter portion of the OSV season, but the results of natal and maternal den and other types of research would be used to determine whether disturbance is occurring and if changes in management are necessary, thereby minimizing impacts to marten.
- It is unknown if or how much competition with or predation on martens by coyotes is occurring on the Lassen National Forest as the result of OSV-related snow compaction or other OSV-related activities; however, reduced trail densities under alternatives 2, 3, 4, and 5 are likely to reduce the potential for predation, because most OSV use on the Lassen National Forest occurs on groomed trails.
- Reduced trail densities, under alternatives 2, 3, 4, and 5 are likely to reduce the potential for impacts to subnivean prey species.

California Spotted Owl (*Strix Occidentalis occidentalis*)

Regional Foresters Sensitive Species

Species Account

The California spotted owl (*Strix occidentalis occidentalis*) is a Region 5 Forest Service sensitive species and a management indicator species for the late seral, closed canopy coniferous forest habitat.

The range of the California spotted owl is divided into two major physiographic provinces: the Sierra Nevada Province and the Southern California Province, with Tehachapi Pass as the dividing line (Verner et al. 1992). The southern Cascade and Sierra Nevada ranges comprise the Sierra Nevada Province, while all the mountain ranges of Southern California and the Central Coast ranges at least as far north as Monterey County comprise the Southern California Province (Ibid). The range of the California spotted owl was revised in 2005, based on mitochondrial deoxyribonucleic acid (mtDNA) haplotypes as follows: west slope (locally on east slope) of Sierra Nevada in California from Shasta (Pit River) and Lassen Counties south to Kern County, and mountains of central, coastal, southern, and transverse ranges of California from Monterey (south side of Carmel Valley) and Kern Counties south through San Diego County to the Cuyamaca Mountains in California, and Sierra San Pedro Martir in Baja California Norte, Mexico (Gutierrez and Barrowclough 2005).

NRM currently has 356 recorded activity centers on the Lassen National Forest. Maps BE-36 and BE-41 show known California spotted owl activity centers and California spotted owl important

habitat[19] occurring within the action area. There are 120,312 acres of known activity sites, buffered by 0.7 mile (table 158, page 489), and 330,312 acres of California spotted owl important habitat (table 159, page 490), including high reproductive habitat, on the Lassen National Forest.

Habitat Status

Across the range of this species, a broad array of habitat types such as western hemlock, mixed evergreen, mixed conifer, Douglas-fir, pine-oak, ponderosa pine, western incense cedar, redwood, Douglas-fir/hardwood, and conifer/hardwood are used (Gutierrez et al. 1995a). In the Sierra Nevada Province, spotted owls occur in conifer, mixed conifer and hardwood, and hardwood forests (Verner et al. 1992). More specifically, spotted owls use the following five vegetation types in the Sierra Nevada: foothill riparian hardwood, ponderosa pine hardwood, mixed-conifer forest, red fir forest, and east side pine forest (USDA Forest Service 2001). Mixed-conifer forest is used most frequently by this species in the Sierra Nevada: approximately 80 percent of known sites are found in mixed-conifer forest, 10 percent in red fir forest, 7 percent in ponderosa pine/hardwood forest, and the remaining 3 percent in foothill riparian/hardwood forest and eastside pine (Ibid). In Northern California, the species' elevational range extends from sea level to approximately 7,600 feet (USDI Fish and Wildlife Service 2015b).

Spotted owl home ranges, and nesting and roosting locations are strongly associated with mature coniferous forests with high tree canopy cover (70 percent or greater), multi-layered canopies, and an abundance of large trees and snags (Forsman et al. 1984, Bias and Gutierrez 1992, Call et al. 1992, Verner et al. 1992, Bond et al. 2004, Chatfield 2005). Spotted owl foraging habitat consists of a broader range of vegetation types that may include younger, more open habitat (Williams et al. 2011, Roberts and North 2012, Keane 2014). Large coarse woody debris is a key habitat feature of spotted owl prey. It has been suggested that some level of landscape (forest) heterogeneity may be an important consideration for spotted owl management and can improve spotted owl conservation (Williams et al. 2011, Roberts and North 2012).

Bond et al. (2004) described spotted owl nesting habitat as typically composed of "forested stands with large trees, moderate-to-high tree densities, high canopy cover, and structural complexity." Structural complexity may be both horizontal and vertical. Habitats used for nesting typically have "greater than 70 percent total canopy cover (all canopy above 7 feet), except at very high elevations where canopy cover as low as 30 to 40 percent may occur (as in some red fir stands of the Sierra Nevada)" (Verner et al. 1992). Large snags and an accumulation of downed woody debris are typically present (Ibid).

Spotted owl habitat use and life history requirements may be discussed at spatial scales varying from the nest area (smallest) to the non-breeding home range (largest). The nest stand (approximately 100 acres) includes one or more forest stands, the nest tree, and possibly several roost sites. Nest stands may be occupied by breeding spotted owls from February until October, and are the focus of all movements and activities associated with nesting. Spotted owls may have more than one nest stand within their home range, and nest stands may be used intermittently for many years. Nesting behavior is initiated in February or early March, when pairs begin roosting together and calling to each other more frequently at dusk before foraging or when returning to roost before dawn (Forsman 1976, Forsman et al. 1984). Egg laying occurs in March or April (Ibid). The average incubation period is 30 ± 2 days, hatching peaks May 7 to 21 (Sierra Nevada), and fledging (young leaving the

[19] Habitat types important for late-successional forest species include stands typed as 4M, 4D, 5M, 5D, and 6 by California Wildlife Habitat Relationship (CWHR 2014), which are all stands of trees greater than 11 inches dbh with greater than 40 percent canopy cover (Sierra Nevada Forest Plan Amendment, USDA Forest Service 2004). In addition, a 7,600-foot elevational limit was included based upon species elevational range (CDFW 2015).

nest) occurs generally when the nestlings are 34 to 36 days old (Forsman et al. 1984). The post-fledging dependency period extends through late summer; dispersal from the natal site occurs in September or October (Gutierrez et al. 1995b, Miller 1989).

Investigations into the thermal ecology and ecological energetics of spotted owls (Weathers et al. 2001) found that this species' metabolic rate increases faster than predicted allometrically in response to thermal stress and that spotted owls have exceptionally low energy requirements, compared to similar-sized non-passerine birds. There is considerable debate (Verner et al. 1992) regarding whether, or to what extent, spotted owls prefer or require the micro-habitats presumed to occur within old growth or late seral forested habitats for nesting or roosting based on species-specific thermal ecology and energetics. Several previous studies of roosting habitat use indicate that northern spotted owls move vertically and horizontally within the canopy to exploit more favorable micro-climates (Forsman et al. 1984). Yet, Verner et al. (1992) presented evidence that California spotted owls occupy and breed in habitats with high ambient summer temperatures, and at least occasionally, nest or roost in full sunlight when ambient temperatures exceed 100 degrees Fahrenheit and are well above the thermoneutral (64.8 to 95.4 degrees Fahrenheit or 18.2 to 35.2 degrees Celsius) zone (Weathers et al. 2001).

The diet of spotted owls varies geographically (Gutierrez et al. 1995b). Spotted owls in the Sierra Nevada Province prey mainly on northern flying squirrels (*Glaucomys sabrinus*), whereas owls in the Southern California Province prey almost exclusively on dusky-footed woodrats (*Neotoma fuscipes*) (Verner et al. 1992). Other prey species in the Sierra Nevada include "deer mice (*Peromyscus maniculatus*), voles (*Microtus* spp.), bats, amphibians, insects (which are consumed with the highest frequency but represent a much lower percentage of the diet by mass), ground and tree squirrels, chipmunks (*Tamias* spp.), and some species of bird" (summarized by Verner et al. 1992).

Potential threats and stressors to spotted owls include high-severity stand-replacing fires, expansion of barred owls (*Strix varia*), loss of large trees and dense canopy cover, habitat fragmentation, climate change, and disease.

Years of fire suppression have led to dense forested conditions with heavy fuel loading; these conditions can reduce the quality of foraging and nesting habitat (Roberts and North 2012). For example, spotted owls do not typically use extremely dense stand conditions characteristic of fire-suppressed forests for foraging (Verner et al. 1992, Irwin et al. 2007).

Dense conditions characteristic of fire-suppressed forests (especially ladder fuels) can also be correlated with increased fire risk. In a synthesis of recent scientific research on California spotted owls, Keane (2013) concluded that spotted owls continue to occupy landscapes that have experienced low- to moderate-severity fire as well as some mixed severity fire. However, the effects of varying fire severities on spotted owl demographics (e.g., survival, reproduction) across multiple spatial and temporal (short-term versus long-term) scales are not well understood, and the current research presents mixed results.

High-severity (catastrophic) fire is considered to be a major potential threat to the California spotted owl (USDI Fish and Wildlife Service 2006). High-severity fires that kill most or all of the living trees effectively reduces the availability of preferred nesting and roosting habitat (mature coniferous forests with high tree canopy cover (70 percent or more), multi-layered canopies, and an abundance of large trees and snags) that can take centuries to regrow. In southwestern Oregon, Clark (2007) and Clark et al. (2011) found that annual survival rates were lower in northern spotted owls inhabiting burned areas or displaced by the wildfire as compared to owls that inhabited areas outside the burn

perimeter. Clark (2007) observed that although 23 northern spotted owls used all types of fire severity, within burned areas owls strongly selected low-severity or unburned areas with minimal overstory canopy mortality. In this burned landscape, owl high-use areas were characterized by lower fire severity and greater structural diversity. Clark (2007) and Clark et al. (2011) also found that post-fire salvage logging reduced owl habitat quality.

Bond et al. (2009) reported that foraging may occur preferentially in high-severity burned areas; the study followed 7 owls in 4-year-old burned areas and found higher than expected owl foraging in high-severity burned areas. The study is limited by small sample size (7 owls), short duration (12 weeks), nonrandom selection of owls, and delay (4 years) following a wildfire. Bond et al. (2002) hypothesized that wildfires may have few short-term impacts on spotted owls; the authors reported that northern California and Mexican spotted owl survival; site fidelity; mate fidelity; and reproductive success at 11 territories one year after fires seemed uninfluenced by the fires. Four of the territories were mapped as having experienced low- to moderate-severity fire and four experienced high-severity fire that burned over 30 percent of the territories. Roberts et al. (2011) estimated that California spotted owls studied in Yosemite National Park had similar detection, density, and occupancy rates between randomly selected unburned sites (16) and recently burned (less than 15 years since burn) sites (16) that had predominantly burned at low to moderate severity. Jenness et al. (2004) found no statistical relationship between fire with mixed severity effects and Mexican spotted owl occupancy and reproduction in Arizona and New Mexico, but the authors caution that higher occupancy and reproduction in unburned sites may not have been detected as statistically significant because of small sample size, lack of information on temporal and spatial variability in owl occupancy rates, and high variability in burn extent and severity.

In a comparison of owl occupancy dynamics in burned versus unburned sites in the Sierra Nevada, Lee et al. (2012) found that the probability (model mean-averaged) of colonization and local extinction did not differ substantially between burned and unburned sites, and the authors concluded that fire has no significant effect on occupancy dynamics. The authors also found that owls continued to occupy sites (a distinct area in which a single or territorial owl or pair had been detected) where almost one-third (32 percent) of suitable habitat had been burned at high severity. They hypothesize that there may be a critical spatial threshold (proportion of a site) above which a burn at high severity could adversely affect spotted owl occupancy.

Collectively, a large number of studies of fire effects on owls suggest the presence of large trees and high overstory canopy closure are the most important pre- and post-fire conditions associated with spotted owl occupancy (Roberts and North 2012). However, it is clear that additional information is needed to better understand the effects of fire intensity on spotted owls.

In the Sierra Nevada, between 1999 and 2002, wildfire severely affected 18 spotted owl PACs and they could be considered “lost” (USDA Forest Service 2004, SEIS pp. 145). The Moonlight fire on the Plumas National Forest burned approximately 65,000 acres (46,000 on NFS lands) in September 2007. Based on fire severity assessment methods and severity maps (Miller and Thode 2007), a total of approximately 43,938 acres (NFS and private lands) burned at high and moderate-high severity (Basal Area Mortality over 50 percent). This fire resulted in the immediate long-term loss of 17 California spotted owl PACs and HRCAs, as well as the removal of 96 percent of the suitable nesting habitat and 86 percent of the suitable foraging habitat within the landscape.

Fuel reduction treatments attempt to remove ladder and surface fuels to reduce the potential for stand-replacing fire. Often, these treatments are conducted using mechanical equipment; on the Lake Tahoe Basin Management Unit, a combination of hand and mechanical treatments are conducted. Overall, there is limited information available about the effects of mechanical vegetation treatments

on spotted owls and habitat condition (Keane 2014). The results of simulation modeling research summarized in Keane (2013) suggests that some fuels treatments can reduce fire risk with minimal effects on owl reproduction, and may have long-term benefits of reducing wildfire risk that outweigh short-term effects of treatments. Ultimately, the risk of not doing anything can outweigh the potential short-term impacts from reducing the risk of stand-replacing fire that would essentially kill all trees.

The USDI Fish and Wildlife Service (2006) recognized that short-term impacts on California spotted owl could occur from fuel reduction projects for the greater, long-term benefit of protecting nesting habitat from being lost to a stand-replacing fire. However, the effects of fuel reduction treatments to prevent stand-replacing fires is not well understood and more on-the-ground information would be useful in an adaptive management framework. For example, Seamans and Gutierrez (2007) found that alteration of 20 hectares or more (49 acres) of mature forest in spotted owl territories may decrease the probability of colonization. In the Plumas National Forest, where the Moonlight Fire resulted in the loss of PACs, fuel reduction treatments in the Meadow Valley Project are demonstrating the effects of fuel reduction treatments on spotted owls. The technique used in the Meadow Valley project, Defensible Fuel Profile Zone is currently not practiced on the Lake Tahoe Basin Management Unit, but results from this study demonstrate that although owls may incur short-term impacts from fuel reduction treatments, this risk outweighs the potential consequences of losing the habitat to a stand-replacing fire like the Moonlight Fire. In addition to the potential effects from fuel reduction treatments, more information is needed on the value of post-fire habitat and potential effects from alteration of this habitat. Northern spotted owls have avoided habitat treated during post-fire salvage logging (Clark 2007, Clark et al. 2011).

Spotted owls face a number of stressors unrelated to fire and forest management activities including the invasion of barred owls (*Strix varia*), climate change, and disease and contaminants. As with the previous description of effects of fire and forest management activities, the information on ecological stressors comes primarily from Keane (2013).

Barred owls are an increasing risk factor for California spotted owls in the Sierra Nevada. Barred owls can hybridize and also out-compete spotted owls. Barred owls were first recorded within the range of the California spotted owl in 1989, on the Tahoe National Forest. Two sparred owls (hybrids of spotted and barred owls) were reported in the Eldorado National Forest during 2003 – 2004 (Seamans et al. 2004), and one of these sparred owls is still present on the study area. Ongoing research has documented 73 records of barred or sparred owls in the Sierra Nevada to date, with the majority of records from the northern Sierra Nevada (Tahoe, Plumas, and Lassen National Forests). Of note, five new records of barred owls were documented in the Stanislaus and Sierra National Forests in 2012, indicating further range expansion of barred owls in the southern Sierra Nevada. Barred owl numbers are likely higher than documented in the Sierra Nevada, as there have been no systematic surveys for them to date.

Across their range, spotted owls exhibit population-specific demographic relationships with local weather and regional climates (Glenn et al. 2010, Glenn et al. 2011, Peery et al. 2012). Based solely on projections of climate change (i.e., not incorporating other factors such as habitat, etc.), this population-specific variation is anticipated to result in population-specific responses to future climate scenarios, which could range from little effect to potentially significant effects. These population-specific responses could result in high vulnerability. For California spotted owls, Seamans and Gutiérrez (2007b) reported that temperature and precipitation during incubation most affected reproductive output, and conditions in winter associated with the Southern Oscillation Index most affected adult survival on the Eldorado National Forest. Weather variables explained a greater proportion of the variation in reproductive output than they did for survival. Further, these two

weather variables were also included in the best models predicting annual population growth rate (Seamans and Gutiérrez 2007b). MacKenzie et al. (2012) found that the Southern Oscillation Index or other weather variables explained little variation in annual reproduction for this same population of owls. Future responses to climate change are likely to be governed by complex interactions of factors that directly affect spotted owls and their habitat, as well indirect factors that can affect habitat (e.g., insect pests, disease, increased fire risk). Carroll (2010) recommended using dynamic models that incorporate vegetation dynamics and effects of competitor species in addition to climate variables to rigorously assess future climate change on spotted owls.

Little information exists on disease prevalence in California spotted owl populations, and no information exists regarding the effects of disease on individual fitness or population viability. Blood parasite prevalence sampling for California spotted owls in the northern Sierra Nevada documented that 79 percent of individuals were positive for at least one infection, whereas 44 percent of individuals tested positive for multiple infections including West Nile Virus, a mosquito-borne flavivirus first detected in eastern North America in 1999, which spread rapidly across the continent. West Nile Virus has been demonstrated to have high acute species-specific mortality rates in many raptor species (owls, hawks, and their relatives) (Gancz et al. 2004). None of the 141 individual California spotted owl blood samples collected from the southern (Sierra National Forest, Sequoia-Kings Canyon National Park) or northern (Plumas and Lassen National Forests) Sierra Nevada from 2004 to 2008 have tested positive for West Nile Virus antibodies, which would indicate exposure and survival (Hull et al. 2010). Adult, territorial California spotted owls have high annual survival (80 to 85 percent) that has been stable across years, and no evidence has been published from the four long-term demographic studies indicating changes in adult owl survival. Nevertheless, although no effects have been documented to date, future outbreaks of West Nile Virus may pose a risk to California spotted owls.

The following CWHR classes provide high capability nesting habitat for this species: Montane Hardwood and Red Fir (5D); and Montane Hardwood-Conifer, Montane Riparian, Sierran Mixed Conifer, and White Fir (5D and 6). Within CWHR, size class 6 is only recognized for a subset of the forest vegetation types (Montane Hardwood Riparian, Montane Riparian, Sierran Mixed Conifer, and White Fir). The following CWHR classes provide moderate capability nesting habitat for this species: Eastside Pine and Lodgepole Pine (5D).

The following CWHR classes provide high capability roosting habitat for this species: Montane Hardwood and Red Fir (5M and 5D); Montane Hardwood-Conifer, Sierran Mixed Conifer, and White Fir (5M, 5D, and 6); and Montane Riparian (5D and 6). The following CWHR types and strata provide moderate capability roosting habitat for this species: Eastside Pine and Lodgepole Pine (5M and 5D); Montane Riparian and Red Fir (4M, 4D, 5S, and 5P); and Sierran Mixed Conifer and White Fir (4M and 4D).

The following CWHR classes provide high capability foraging habitat for this species: Montane Hardwood and Red Fir (5M and 5D); Montane Hardwood-Conifer, Sierran Mixed Conifer, and White Fir (5M, 5D, and 6); and Montane Riparian (5D and 6). The following CWHR classes provide moderate capability foraging habitat for this species: Eastside Pine and Lodgepole Pine (5M and 5D); Montane Hardwood (4M and 4D); Montane Hardwood-Conifer, Red Fir, Sierran Mixed Conifer, and White Fir (4M, 4D, 5S, and 5P); and Montane Riparian (3M, 3D, 4M, 4D, 5S, 5P, and 5M).

Throughout the Sierra Nevada, California spotted owl nesting habitat is protected in California spotted owl protected activity centers (csoPACs). A csoPAC includes 300 acres of the highest quality nesting habitat available, and the most recent nest site or activity center within a spotted owl

breeding territory as described in management direction for the forest (USDA Forest Service 2004b). A csoPAC size of 300 acres corresponds with the following two criteria reported by Verner et al. (1992) in the California spotted owl report: (1) the size of the nest stand and adjacent suitable nesting stands; and (2) the area encompassing approximately 50 percent of radio-telemetry locations within spotted owl territories on the Sierra National Forest (USDA Forest Service 2001). The amount of high and moderate capability nesting, roosting, and foraging habitat within each csoPAC varies according to what is available, given existing conditions, on the forest. The csoPAC is considered to be suitable for nesting and foraging.

High reproductive habitats include blue oak – foothill pine, Sierran mixed conifer, ponderosa pine, red fir, montane hardwood, montane hardwood-conifer, montane riparian and white fir and Jeffrey pine; eastside pine types are not considered suitable for California spotted owls (USDI Fish and Wildlife Service 2015b).

Zimmerman et al. (2003) investigated whether this territorial species follows an ideal despotic distribution and found a positive correlation between territory occupancy and "potential fitness" as estimated from survival and reproduction; generally supporting an ideal despotic distribution (though some noise in the data was observed). Perceptual limitations, prey dynamics, and large territory sizes were identified as potential factors affecting the ability of individuals to assess habitat quality accurately. Dispersal processes, high survival rates, and long life spans were suggested as other key factors that may prevent some individuals from selecting the highest quality sites as predicted by an ideal despotic distribution (Ibid).

A home range core area (HRCA) includes its associated PAC, is 1,000 acres in size, and is composed of the best available contiguous habitat. Like PACs, HRCAs are protected in the Sierra Nevada. The core area corresponds with 20 percent of a breeding pair home range plus one standard error. Home ranges vary substantially across the range of this subspecies. Home range sizes of California spotted owls tend to be smallest in lower-elevation hardwood forests, intermediate in size in conifer forests of the central Sierra Nevada, and largest in true fir forests in the northern Sierra Nevada. Sierra National Forest owls were found to have a median home range for pairs of approximately 3,000 to 5,000 acres (Verner et al. 1992). However, Verner et al. (1992) cite an overall mean home range size of owl pairs during the breeding period in Sierran conifer forests of about 4,200 acres.

Four demographic studies of California spotted owl have been ongoing for a number of years within the Sierra Nevada: (1) Eldorado National Forest (since 1983); (2) Lassen National Forest (since 1990); (3) Sierra National Forest (since 1990); and (4) Sequoia-Kings Canyon National Park (since 1990). One of the primary objectives of the demographic studies is to monitor rate of change (lambda (λ)) in owl populations (i.e., the number of owls present in a given year divided by the number of owls present the year before). For these demographic models, a lambda of 1.0 indicates a stable population; less than 1.0 indicates the population is decreasing, and greater than 1.0 indicates an increasing population. Lambda is estimated from models and is typically presented as an estimate of the rate of population change, along with the standard error (SE) or a 95 percent confidence interval. The 95 percent confidence interval represents the reliability of the estimate of lambda. Managers typically view a population as stable if the 95 percent confidence interval overlaps a lambda of 1.0.

A meta-analysis of the data from 1990 to 2005 for the four spotted owl populations in the study areas concluded that, with the exception of the Lassen study area, owl populations were stable, with adult survival rate highest at the Sequoia-Kings Canyon study site (Blakesley et al. 2010). The 95 percent confidence limit for lambda in the Lassen study area ranged from 0.946 to 1.001 (estimated value 0.973), indicating a stable population.

Recent analyses from the same four demographic study areas suggest that there may be a concern for decline in spotted owls within the three national forest demographic study areas in the Sierra Nevada (Eldorado, Sierra, and Lassen National Forests). A preliminary analysis conducted by the Sierra Nevada Adaptive Management Project in 2011, indicates that the owl population on the Eldorado National Forest may be declining, but the 95 percent confidence interval for lambda overlaps 1.0 (Gutierrez et al. 2012). Tempel and Gutiérrez (2013) conclude that data from the Eldorado Density Study Area (60 percent National Forest System land in Eldorado National Forest and 40 percent private land managed by timber companies) suggest a 31 percent decline in the spotted owl population size from1993 to 2010, but again, the 95 percent confidence interval slightly overlapped 1.0 for all parameters. Using data for an 18-year study period, Conner et al. (2013) found that the different estimators for 'realized population change' (expressed as 'delta' or Δ_t – ratio of population size at end time to initial population size) indicated population declines of 21 to 22 percent for the Lassen study area and 11 to 16 percent for Sierra study area, with an increase of 16 to 27 percent for Sequoia-Kings Canyon study area. The annual rate of population change (*lamda*) also showed a declining trend. However, similar to the analyses conducted by Tempel and Gutiérrez (2003) the confidence intervals overlapped 1.0 for all estimators and all study areas. As stated in Conner et al. (2013) "If a population is growing (lambda greater than 1.0), managers cannot tell whether the growth is from internal recruitment or immigration. Likewise, if a population is declining, managers cannot determine whether the declines are due to deaths within the population or emigration. Thus, additional information on specific vital rates is necessary to understand what is driving lambda and ultimately, the mechanisms driving population dynamics." Causation for any potential decline in occupancy is unknown.

Using data collected at three of the four long-term California spotted owl study areas, including Lassen National Forest, Connor et al. (2013) compared mean λ and Δ_t as summaries of population change over time and evaluated the use of the posterior distribution of Δ_t as a means for estimating the probability of population decline retrospectively. For the Lassen study area, estimated median Δ_t over the 18-year monitoring period was 0.78, suggesting a 21 percent decline in population size. The probability of a 15 percent or greater decline over 18 years was 0.69, whereas the probability the population was stationary or increasing was 0.07. However, if a population is declining (mean λ less than 1.0), managers cannot determine whether the declines are due to deaths within the population or emigration. Thus, additional information on specific vital rates is necessary to understand what is driving λ and ultimately, the mechanisms driving population dynamics. Although mean λ and Δ_t are important metrics, they may not suffice for a full assessment of a population's health (Blakesley et al. 2010).

As previously described, focused studies on northern spotted owls (Shasta-Trinity and Mendocino National Forests), a species whose biology is very similar to California spotted owls, have been conducted to evaluate direct effects of noise on the species during its breeding timeframes. Behavioral responses to disturbance, such as leaving an area, can be readily observed (Tempel and Gutierrez 2003). Physiological responses to disturbance are not as easy to detect because they are not necessarily associated with behavioral responses (Tempel and Gutierrez 2003). Research has been conducted to measure the effects of noise on physiological stress levels of northern and California spotted owls through the analysis of fecal corticosterone (Wasser et al. 1997, Tempel and Gutierrez 2003, Tempel and Gutierrez 2004) and fecal glucocorticoid (Hayward et al. 2011). It is difficult to tease out background differences in fecal corticosterone and fecal glucocorticoid levels from variables such as environment, body condition, and gender (Tempel and Gutierrez 2004; Hayward et al. 2011), making cause and effect determinations of whether disturbance is related to the action being tested or some other factor. The studies varied in design, analysis, and conclusions. The study by Hayward et al. (2011) is most similar to conditions in this project in that it used off-highway

vehicles. However, it is dissimilar in that exposure was applied by conducting simulated enduro events in which motorcycles traveled back and forth along a 0.5-mile length of road within 50 to 800 meters (0.03 to 0.5 mile) of roost or nest locations for an hour. Conditions such as these would only be expected on OSV trails with heavy use or near trailheads. Results from this study indicate that there were increased levels of fecal glucocorticoid, particularly in adult males in response to acute traffic exposure (i.e., and reduced reproductive success in response to this level of activity (Hayward et al. 2011). The highest sensitivity appeared to occur among males in May when they were the sole providers for their mates and offspring, suggesting that spring may be a particularly important time to limit motorized recreation near northern spotted owl territories (Ibid.). There was no evidence that fecal glucocorticoid response to enduro diminished with exposure to routine road noise in May or among northern spotted owl within 50 meters (164 feet) of a road in July. Traffic appeared always to be highly disturbing to these northern spotted owls. The fact that male northern spotted owls 50 to 800 meters (0.03 to 0.5 mile) from loud roads showed lower fecal glucocorticoid response to acute motorcycle exposure compared to northern spotted owls an equivalent distance from quiet roads in July suggests that partial habituation to noise from traffic may occur in this species among individuals as long as they are a sufficient distance (over 50 meters (164 feet)) from the road.

Direct and Indirect Effects

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to California spotted owl are listed in table 157.

Table 157. Resource indicators and measures for assessing effects to California spotted owl

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to or displacement of individuals from noise and increased human presence, injury or mortality of individuals	Acres and percentage of important habitat impacted by OSV use	112,300 (34%)	108,154 (33%)	99,116 (30%)	111,136 (34%)	82,831 (25%)
Potential for disturbance to or displacement of individuals from OSV use and increased human presence, injury or mortality of individuals	Acres and percentage of buffered CSO activity centers impacted by OSV use	38,416 (32%)	38,192 (32%)	34,020 (28%)	37,595 (31%)	32,451 (27%)

California spotted owl is associated with late-successional forests that can be impacted by activities associated with trails. Gaines et al. (2003) conducted a literature review of 71 late-successional-forest-associated wildlife species and identified negative effects on these species that can result from route-associated factors. These impacts include direct loss of habitat from type conversion, diminished quality of habitat attributes or fragmentation, and road avoidance or displacement

resulting from direct harassment or noise disturbance. Individuals, environmental groups, and agency biologists have expressed growing concern over habitat fragmentation for late-successional forest-associated species. Various studies have shown that this species group is vulnerable to disturbance, changes in habitat, or displacement by habitat generalists.

Snowmobile use within late-successional forest habitats can have the following direct effects to individuals or their habitat (Gaines et al. 2003): Disturbance and potential for injury or mortality to individuals from vehicle collisions.

Disturbance:

Displacement of populations or individual animals from a route, related to human activities.

Disturbance and displacement of individuals from breeding or rearing habitats.

Physiological response to disturbance, resulting in changes in heart rate or level of stress hormones.

Potential for Injury or Mortality to Individuals from Vehicle Collision:

Although there is the potential for collision of California spotted owls with OSVs or grooming equipment, the likelihood of it is very low for the following reasons: spotted owls spend little time at ground level; whereas spotted owls are nocturnal, most OSV use on the Lassen occurs during daytime hours; and although snow grooming equipment operates during darkness, the equipment travels slowly (3 to 6 mph).

Potential indirect effects include:

- Altered or dispersed movement as caused by a route or human activities on or near a route.
- Snow compaction (prey base for several of the other late-successional forest species under consideration).

In addition, Gaines et al. (2003) found an interaction that occurred on winter recreation trails was the indirect effect of snow compaction on the subnivean sites used by small mammals in which small mammals can either be suffocated as a result of the compaction, or their subnivean movements can be altered owing to impenetrable compact snow. Adverse effects to subnivean animals could indirectly affect the prey base for many Forest Service sensitive species, including California spotted owl.

According to Forsman et al. (1984) spotted owl courtship behavior usually begins in February or March with the timing of nesting and fledging varying by elevation and latitude. April 1 coincides with incubation in most areas (USDI Fish and Wildlife Service 2012). The OSV grooming season generally begins in mid-December and continues through March. Start and stop times vary by trail location and are dependent upon the presence and depth of snow. As described in the assumptions section, for the purpose of this analysis, April 30 will be used as the cut-off date for the maximum period of interaction between California spotted owls and OSV use and related activities.

The Forest Service considers activities greater than one-quarter mile (400 meters) from a spotted owl nest site to have little potential to affect nesting spotted owls. Snowmobiles passing within 0.25 mile of unsurveyed nesting/roosting habitat or an active nest have the potential to disturb nesting spotted owls. Under all alternatives, groomed and non-groomed trails and staging areas occur within 0.25 mile of California spotted activity centers and/or important habitat. However, OSV use is not consistent across all available habitat. Although we don't know specifically where impacts would occur at any given time and we cannot quantify the amount of impact, we know the potential for impacts would be greatest in areas most of high OSV use. As described in the assumptions section,

flatter areas with slopes less than 21 percent and canopy cover less than 70 percent, including the trails and staging areas, themselves, are used more by OSVs than others and, therefore, likely to receive the highest use. Those assumptions have been incorporated into the following analysis.

As previously discussed, behavioral responses to disturbance, such as leaving an area, can be readily observed in spotted owls (Tempel and Gutierrez 2003) and sensitivity in adult male spotted owls in response to acute traffic exposure was highest in May (Hayward et al. 2011). A total of 120,312 acres of buffered California spotted owl activity sites and 330,312 acres of important habitat occurs within the analysis area. The intensity and duration of noise-generating activities tested by Hayward et al. (2011) are not expected to occur as a result of the proposed action because the maximum period of interaction between OSVs, and related activities occurs prior to May, when breeding adult males are most sensitive to noise, and noise associated with snowmobile use and associated activities in the action area is expected to be of short duration (amount of time it would take to travel through any one given area) and of intermittent intensity (amount of concentrated noise).

In addition, monitoring of PACs by Lassen National Forest found no apparent relationship between a PAC's distance from a snow park and whether it was recently occupied (California OSV Program Final EIR (2010)). Based on the overlap with the breeding seasons for both northern goshawk and California spotted owl, it was recommended that snow grooming activities not be allowed to extend beyond the forest order expiration date of March 31, and under the existing condition, it does not.

Based upon OSV use patterns described in the assumptions section, once OSV trail grooming ends, it is estimated that use of those trails declines by 50 percent. Therefore, the potential for direct and indirect effects to activity centers within 0.25 mile of groomed trails would decrease substantially after March 31 for alternatives 1 through 3, but not necessarily for alternative 4. Due to the structural nature of important spotted owl habitat (i.e., dense forested stands), the level of cross-country travel occurring in this habitat is less than the amount of available habitat. The potential for noise-based disturbance is actually expected to be lower because use, and therefore, the highest potential for disturbance is expected within 0.5 mile of existing roads, trails and staging areas, under all alternatives. Vegetative structure of habitat would not be physically modified by OSV use and related activities.

Trail grooming occurs on existing roads and trails and primarily occurs at night when fewer species are active, but when spotted owls are more active. Under alternatives 1, 2, 3, and 5 the snow grooming season would conclude on March 31; under alternative 4, it would be left to the discretion of the groomer and could extend for as long as 12 inches of snow remain on the ground. Therefore, under all of the alternatives, snow grooming season overlaps with a portion of the March 1 through August 15 California spotted owl breeding season. However, under alternative 4, it could last longer, which is not consistent with Lassen National Forest OSV monitoring report recommendations. Potential effects of noise disturbance would be the same as those noted due to OSV use. In addition, trail grooming and night riding could disturb owls that forage at night. A passing trail grooming machine or OSV may interrupt owl foraging, result in owl prey taking refuge, or cause owls to redirect their foraging away from trail areas. However, due to the limited frequency[20] and duration of trail grooming at any trail segment location, as well as grooming activity being an ongoing operation

[20] Grooming operations at most trail systems currently operate near a maximum level. Trails are prioritized for grooming based on visitor use. Grooming on priority trails occurs several times per week and after significant storms. The total hours of trail grooming occurring expected at each site for an average season vary from 94 annual snowcat hours at Swain Mountain to 680 hours at Bogard and Fredonyer on the Lassen National Forest. Snow removal on access roads and trailhead parking areas, serving the OSV Program trail systems, occurs several times during storm events as necessary dependent upon weather conditions (California Department of Parks and Recreation 2010).

for many years on the same trails, the noise disturbance from trail grooming would not have a significant impact on breeding or foraging spotted owls.

Although OSV use or related activities would not physically alter the vegetative structure of spotted owl habitat, spotted owl prey species, that use the subnivean space could be subject to OSV-related impacts from snow compaction, including suffocation or alteration of movement while foraging in the subnivean space beneath the snow. The degree of this impact is unknown, but would be more likely in areas most conductive to OSV.

Comparison of the Alternatives

Table 158 and table 159 show and compare, by alternative, the acres of known activity centers buffered by 0.70 mile and important California spotted owl habitats, respectively, with the potential for direct and indirect effects from OSV use and related activities. Ninety-five percent of California spotted owl activity centers buffered by 0.70 miles are currently open to OSV use (alternative 1). However only 32 percent is currently open to OSV use and of moderate to high OSV use (map BE-36). Similarly, 88 percent of important California spotted owl habitat is currently open to OSV use, but only 34 percent is currently open to OSV use and of moderate to high OSV use (map BE-33). The potential for OSV-related impacts to California spotted owls, including noise-based disturbance, snow compaction impacting subnivean space of prey species, or injury/mortality, would be most likely to occur in those areas of moderate to high OSV use. In addition, of the 32 percent of buffered activity centers and the 34 percent of important habitat currently open to and of moderate to high OSV use, high OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within in an even smaller percentage of each of those habitats. This would be similar under the other three alternatives.

Table 158. Acres of known California spotted owl activity centers, buffered by 0.70 mile, with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	114,001	112,754	98,659	111,174	90,413
Not Designated for OSV use	6,311	7,516	21,159	8,643	29,843
Moderate to high OSV use and OSV use restricted to trails	NA	NA	13	NA	13
Total	120,312 acres				
Designated for OSV use and of moderate to high OSV use (percent of buffered total)	38,416 (31.9%)	38,192 (31.7%)	34,020 (28.3%)	37,595 (31.2%)	32,451 (27.0%)
Not Designated for OSV use and of moderate to high OSV use	1,341	1,560	5,697	2,126	7,301
OSV use restricted to trails	NA	NA	6	NA	6
Total	39,757 acres				

Under alternative 2, 33 percent of important California spotted owl habitat (map BE-42) and 32 percent of buffered PACs (map BE-37) would be designated and of moderate to high OSV use. Similarly, 30 percent of important habitat (map BE-43) and 28 percent of buffered PACs would be

designated and conductive to OSV under alternative 3 (map BE-31) and 34 percent of important habitat (map BE-38) and 31 percent of buffered PACs under alternative 4 (map BE-39). Alternative 5 would produce the lowest amount of potential disturbance with 25 percent of important habitat (map BE-45) and 27 percent of buffered PACs designated and of moderate to high OSV use (map BE-40). The Forest would use the results of ongoing inventory and monitoring of California spotted owl activity centers to determine whether or not disturbance is occurring and if changes in management are necessary. The potential for noise-based disturbance would largely overlap with roughly the first 20 percent, or the pair bonding, mating, and egg laying stages, of the March 1 through August 15th California spotted owl breeding season under alternatives 1, 2, 3, and 5, and may extend up through the first one-third of the breeding season, into the hatching stage, under alternative 4. As previously described, once OSV trail grooming season ends on March 31, trail use declines by roughly 50 percent and, therefore, the potential for direct and indirect effects to activity centers within 0.25 mile of groomed trails would decrease by an estimated 50 percent after March 31 for alternatives 1 through 3 (and not long, thereafter, for alternative 4, with the exception of extremely high snowfall years).

Under all of the action alternatives (i.e., alternatives 2, 3, 4, and 5) trail densities would decline from 1.5 mi/m^2 to 0.2 mi/m^2. And, because the majority of OSV use occurs on or within 0.5 mile of groomed trails and staging areas, or within meadows within 0.5 mile of designated trails, the potential for impacts to subnivean prey species, would be expected to decline with reduced trail densities under alternatives 2, 3, 4 and 5.

Table 159. Acres of important California spotted owl habitat with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	289,900	274,994	250,063	286,946	201,497
Not Designated for OSV use	40,406	54,926	79,589	40,940	125,735
OSV use restricted to trails	NA	NA	52	NA	52
Total	330,312 acres				
Designated for OSV use and of moderate to high OSV use (percent of habitat total)	112,300 (34.0%)	108,154 (32.7%)	99,166 (30.0%)	111,136 (33.6%)	82,831 (25.1%)
Not Designated for OSV use and of moderate to high OSV use	9,346	13,341	22,337	10,187	37,814
Moderate to high OSV use and OSV use restricted to trails	NA	NA	29	NA	29
Total	121,646 acres				

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to California spotted owl, when combined with alternatives 1, 2, 3, 4, or 5 include vegetation management projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. For

example, the Castle Defensible Fuel Profile Zone 2 is proposed on 39 acres within 0.25 mile of PAC PL 121; PL 121 is also within 0.25 mile of groomed OSV trail 27N11. However, seasonal limited operating periods required for vegetation projects would prevent disturbance to known nest sites. In another example, the Dutch and Tamarack fire salvage projects would remove standing dead or dying trees across roughly 1,500 and 1,300 acres, respectively, of coniferous forest including Sierran mixed conifer, suitable California spotted owl habitat, in the northwestern portion of the analysis area. However, the area does not overlap with any known csoPACs. In addition, vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires. Management prescriptions have emphasized retention of large snags and logs, as well as retention of large conifer, over a 20-year period. These are all important habitat attributes for spotted owl foraging habitat.

California spotted owl habitat also overlaps with areas open to Christmas tree and firewood cutting. However, wheeled motorized vehicles may not be used off of authorized National Forest System roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014), there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1 and December 31) and OSV trail grooming season (beginning December 26), and disturbance or displacement from these activities would occur outside of the California spotted owl breeding season under alternatives 1, 2, 3, and 5. Under alternative 4, in which trail grooming would begin at the discretion of the groomer, there is the potential for a somewhat larger degree of overlap during years in which heavy snowfall begins early. Use of roads within California spotted owl habitats after the March 31 termination date of the forest order closing roads for exclusive OSV use can contribute additional disturbance during the early part of the breeding season, particularly for nests within 0.25 mile of roads. In general, most non-motorized winter recreation occurs along designated trails and California spotted owl would either avoid roosting in those areas, if too great a disturbance, or habituate to the noise. Similar activities on State and private lands within the forest boundary and within one-quarter mile of California spotted owl habitats may impact habitat availability outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown; State and privately held lands make up about 20 percent of the area within the forest boundary. In summary, ongoing and reasonably foreseeable actions may be additive locally to individual California spotted owls, but, given the small scale for the potential of overlap of cumulative effects in time and space with any of the alternatives, they are not expected to contribute substantial impacts to effects discussed for the project under any of the alternatives.

Determination Statement

Based upon the best available data and scientific information, all of the alternatives of the Lassen National Forest Over-Snow Vehicle Use Designation Project would impact individuals, but are not likely to lead to a trend toward Federal listing or a loss of viability for California spotted owl in the Forest Plan area based on the following rationale:

- OSV proposed actions would not physically modify the vegetative structure or composition of any suitable (nesting, roosting or foraging), dispersal, or capable habitat within the project area.
- Due to the structural nature of suitable habitat (i.e., dense forested stands), the level of cross-country OSV travel in California spotted owl suitable habitat is expected to be relatively low, and most disturbance is likely to occur primarily along existing roads and trails. Although the potential for noise-based disturbance to individuals within important habitat ranges from 25 to 34 percent, and individuals within buffered PACs ranges from 27 to 32 percent, under all of the

alternatives, the percentage of habitats impacted would actually be lower considering that the concentration of OSV use is not equal across the landscape.

- The potential for OSV-related noise-based disturbance would overlap with only the early part of the March 1 through August 31 California spotted owl breeding season.
- OSV use is most common on trails. Once OSV trail grooming season ends on March 31, trail use declines by roughly 50 percent and, therefore, the potential for direct and indirect effects to activity centers within 0.25 mile of groomed trails would decrease by an estimated 50 percent after March 31 for alternatives 1 through 3 and 5 (and not long, thereafter, for alternative 4, with the exception of extremely high snowfall years).
- The forest would use the results of ongoing inventory and monitoring of spotted owl activity centers to determine whether or not disturbance is occurring and if changes in management are necessary, thereby minimizing impacts to California spotted owl.
- Based upon analysis of previous monitoring data, Lassen National Forest found no apparent relationship between a csoPAC's distance from a snow park and whether it was recently occupied.
- Other than a single OHV study, with uncharacteristically high disturbance exposure times, there is no evidence of a disturbance impact to individuals or reproductive output.
- There is no evidence linking OSV noise-based disturbance to long-term population declines.
- Disturbance to California spotted owl foraging behavior would largely be limited to areas adjacent to OSV trails and short-term in nature during trail grooming because the species is nocturnal and OSV use largely occurs during the daytime.
- The potential for OSV collision with individual California spotted owls is very low.
- Reduced trail densities, under alternatives 2, 3, 4, and 5 are likely to reduce the potential for impacts to subnivean prey species.

Northern Goshawk (*Accipiter gentilis*)

Regional Foresters Sensitive Species

Species Account

Northern goshawks occupy boreal and temperate forests throughout the Holarctic zone (Squires and Reynolds 1997). This broad range of forested communities includes mixed conifer, true fir, montane riparian, Jeffrey pine, ponderosa pine, and lodgepole pine forests (USDA Forest Service 2004). Within California, this species occurs in the Sierra Nevada, Klamath, Cascade, Inyo-White, Siskiyou, and Warner Mountains, and the North Coast Ranges.

The northern goshawk (*Accipiter gentilis*; goshawk) is a Forest Service Sensitive Species on the Lassen National Forest. Goshawk territories on Lassen National Forest are managed as protected activity centers (ngoPAC) under direction prescribed by the Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004). NRM contains numerous goshawk nest site data points. Because goshawks may have multiple nest areas within their home range, ngoPACs are used for this analysis. Based upon the best available data, there are 172 designated ngoPACs on Lassen National Forest totaling 31,433 acres. The Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004) requires that goshawk surveys be conducted for any new vegetation management activities. Ongoing surveys have occurred since 1993, and much of the suitable habitat within roaded, commercial forest areas has been surveyed (USDA Forest Service 2010).

Habitat Status

The goshawk prefers mature forests with large trees on moderate slopes with open understories. They nest in coniferous, deciduous, or mixed-pine forests, depending on availability (Squires and Reynolds 1997). Goshawks typically use multiple nesting sites within a nesting territory, which can sometimes be located more than one-half mile apart (Woodbridge and Detrich 1994). Because of this behavior, locating active nesting locations and verifying occupancy of a territory can be difficult using only irregular broadcast surveys or searches for active nests. As a result, verification of an inactive stand requires multiple visits in subsequent years.

The goshawk is a year-round resident throughout most of California. Since the early 1970s, research has resulted from concerns about the effects of forest management on populations (Squires and Reynolds 1997). The nesting home range of goshawks contains three components: the nest area, the post-fledging family area, and the foraging area, each with its individual characteristics and management requirements.

Northern goshawk nesting habitat at the nest stand scale has consistently greater canopy cover, greater basal area, greater numbers of large-diameter trees, fewer small-diameter trees, less understory cover, and gentle to moderate slopes relative to non-used, random sites (USDA Forest Service 2001). McGrath et al. (2003) found that goshawks in the Interior Northwest nested, at the 0.4 acre (one hectare) scale, on the lower one-third or bottom of north-facing slopes in stands characterized by relatively higher basal area, higher quadratic mean diameter, greater canopy closure, and greater live stem densities, compared to random sites. Goshawks nesting in the relatively open-canopied and xeric stands found on the eastern slopes of the Sierra Nevada in the Inyo National Forest selected nest stands with a mean canopy closure of 29 percent (Hargis et al. 1994). Variability in the structural characteristics of nest stands between studies appears to be related to differences in vegetation type and geographic region.

Within the Lake Tahoe region of the Sierra Nevada, Keane (1999) found that nest-site areas (0.25 acre) were characterized by high canopy closure (mean=70.4 percent, SE=3.1, canopy measured above 9.8 feet or 3 meters), high densities of live trees in greater than 24- to 40-inch (mean=22.1 trees per acre, SE=3.2) and greater than 40-inch (mean=15.8 trees per acre, SE=2.2) dbh classes, high densities of dead trees in the greater than 24- to 40-inch (mean=3.6 trees per acre, SE=0.7) class, low densities of 2- to 12-inch dbh live trees (mean=121.4 trees per acre, SE=12.3), and low shrub/sapling and ground cover (mean=9.9 percent, SE=2.0). No difference in slope aspect was detected for nest sites (Ibid.).

The goshawk breeding season is February 15 through September 15. Breeding activity for goshawks can be broken down into five general activity stages: courtship (pre-breeding), laying, incubation, nestling, and fledgling stages. The courtship stage typically begins in mid-February or early March and extends through the formation of breeding pairs, nest building, and copulation. Egg laying and incubation overlap in goshawks, with eggs being laid every 3 days, and incubation beginning with the laying of the second egg. The average incubation period is approximately 33 days and the nestling period typically extends from early June through early July, with most young fledged by mid-July. The post-fledging dependency period extends until mid/late August (Woodbridge and Hargis 2006). The onset of the incubation in the Lassen National Forest region (southern Cascades/ northern Sierra Nevada) occurs between April 10 and May 15 (USDA Forest Service 2010), though it can be delayed by up to a month with cool or damp spring weather (Younk and Bechard 1994), and lasts 28 to 38 days. Nestlings typically fledge at 35 to 42 days old (Squires and Reynolds 1997).

Goshawks are morphologically adapted to foraging in forested habitats, but are also adapted to ambushing prey in open habitats (summarized in Squires and Reynolds 1997). Moderately dense, mature conifer forests are generally the preferred foraging habitat for this species (Ibid). However, goshawks also forage in a variety of other forest age classes, structures, and compositions, and into openings and along forest edges (summarized in Reynolds et al. 2006). In California, mature and old growth habitat (20.8 inches and greater dbh, canopy closure 40 percent and greater) were used, whereas open habitats such as meadows and early seral areas were avoided in mixed-conifer forests (Austin 1993). In Arizona, Beier and Drennan (1997) found that goshawks foraged in stands that had higher canopy closure, greater tree density, and a greater density of large trees (over 16.2 inches dbh) than on contrast plots. Snags and logs are key components of goshawk foraging areas, as they provide habitat for prey species. Prey availability rather than prey abundance, within suitable foraging habitats, appears to be more important to habitat use by this species (Reynolds et al. 2006).

Northern goshawks are known to prey on over 50 species of birds and mammals throughout their western range (Graham et al. 1999). Prey size varies little between geographic regions (Boal and Mannan 1994). In the Lake Tahoe region, primary prey species include Douglas squirrel (*Tamiasciurus douglasii*), Steller's jay (*Cyanocitta stelleri*), northern flicker (*Colaptes auratus*), and ground squirrel (*Spermophilus* spp.). Other prey species include American robin (*Turdus migratorius*), blue grouse (*Dendragapus obscurus*), other woodpeckers, and other squirrels (Keane 1999).

The following CWHR classes provide high capability nesting habitat for this species: Jeffrey Pine, Lodgepole Pine, Montane Hardwood, and Subalpine Conifer (4M, 4D, and 5D); Montane Hardwood-Conifer, Montane Riparian, Sierran Mixed Conifer, and White Fir (4M, 4D, 5D, and 6); and Red Fir (5D). Within CWHR, size class 6 is only recognized for a subset of the forest vegetation types (Sierran Mixed Conifer, White Fir, Montane Hardwood-Conifer, Montane Riparian, and Aspen). The following vegetation types and strata provide moderate capability nesting habitat for goshawks: Aspen (4M, 4D, 5D, and 6), Eastside Pine (3M, 3D, 4M, 4D, and 5D), Lodgepole Pine (3M and 3D), Red Fir (4M and 4D), and Subalpine Conifer (3M and 3D).

The following CWHR classes provide high capability perching habitat for this species: Jeffrey Pine, Lodgepole Pine, Montane Hardwood, Montane Hardwood-Conifer, Montane Riparian, Sierran Mixed Conifer, Subalpine Conifer, and White Fir (4M and greater size and density classes); and Red Fir (5M and 5D). The following CWHR types and strata provide moderate capability perching habitat for this species: Aspen and Eastside Pine (3M and greater size and density classes); Jeffrey Pine, Lodgepole Pine, Sierran Mixed Conifer, Subalpine Conifer, and White Fir (3M, 3D, 4S, and 4P); Montane Hardwood, Montane Hardwood-Conifer, and Montane Riparian (4S and 4P); and Red Fir (4M, 4D, 5S, and 5P).

The following CWHR classes provide high capability foraging habitat for goshawk: Alpine Dwarf-Shrub (all strata); Eastside Pine (4D, 5S, 5P, 5M, and 5D); Jeffrey Pine, Lodgepole Pine, Montane Hardwood, Montane Hardwood-Conifer, Montane Riparian, Sierran Mixed Conifer, Subalpine Conifer, and White Fir (4M and greater size and density classes); and Red Fir (5M and 5D). The following vegetation types and strata provide moderate capability foraging habitat for goshawks: Aspen (3M and greater size and density classes); Eastside Pine (1, 2S, 3S, 3P, 3M, 3D, 4S, 4P, and 4M); Jeffrey Pine, Montane Hardwood, Montane Hardwood-Conifer, Montane Riparian, Sierran Mixed Conifer and White Fir (4P and below); Juniper and Pinyon Juniper (3S and greater); Lodgepole Pine and Subalpine Conifer (1, 2S, 3S, 3P, 3M, 3D, 4S, and 4P); and Red Fir (3M, 3D, 4S, 4P, 4M, 4D, 5S, and 5P).

Goshawk habitat use and life history requirements may be discussed at spatial scales varying from the nest area (smallest) to the non-breeding home range (largest). The nest area (approximately 20 to 25 acres) includes one or more forest stands, the nest tree, and possibly several alternate nests. Nest areas may be occupied by breeding goshawks from mid-February until late September, and are the focus of all movements and activities associated with nesting. Goshawks may have multiple nest areas within their home range, and nest areas may be used intermittently for many years. Nest areas have relatively high canopy cover (typically greater than 50 percent) and a high density of large trees.

The post-fledging family area corresponds to the area (approximately 500 acres) used by the adults and young from the time the young fledge until they are no longer dependent on the adults for food. Post-fledging family areas provide juveniles with cover from predators and sufficient prey to develop foraging skills prior to dispersal. Post-fledging family areas typically include a variety of forest conditions and areas of high canopy cover (greater than 50 percent).

The home range increases in size from the breeding season to the non-breeding season and is generally larger for males than for females throughout the year. During the breeding season, the average home range of goshawks in the Lake Tahoe area is 6,745 acres for males and 5,040 acres for females. Non-breeding season home ranges averaged 23,448 acres for males and 13,888 acres for females (Keane 1999). Home ranges include areas with a greater proportion of larger tree size classes and higher density classes than that randomly available across the landscape. The area within the home range, but outside the post-fledging family area, is often referred to as the foraging area (Reynolds et al. 1992). Maintaining requisite habitat elements can be best accomplished by managing large tracts of forests as sustainable ecological units where forest successional processes are continually moving a number of stands, within the natural range of variability, through the late seral stages preferred by this species (Graham et al. 1999).

Goshawks are well known to be territorial and exhibit high site fidelity (Detrich and Woodbridge 1994). In the Sierra Nevada, northern goshawk nesting habitat is protected by the delineation of ngoPACs. Northern goshawk PACs are delineated to include the best available 200 acres of nesting habitat, and the most recent nest site and alternate nests within a goshawk breeding territory as described in management direction for the forest (USDA Forest Service 2001, USDA Forest Service 2004). The size of the PACs corresponds with criteria reported by Detrich and Woodbridge (1994) such that territory occupancy rates of approximately 100 percent were associated with clusters of nest stands totaling 150 to 200 acres (USDA Forest Service 2001).

Threats

Some of the threats facing goshawk include habitat loss and fragmentation (e.g., loss of large-diameter trees), forest structure changes and changes in prey populations due to fire suppression and climate change, risk of habitat loss due to stand-replacing fires, and disturbance from human activity in and near territories. A study conducted by Morrison et al. (2011) in the Lake Tahoe Basin indicated that northern goshawks are susceptible to human disturbance; human activity was twice as high within infrequently occupied territories as compared to frequently occupied territories. Many kinds of human activities have been documented to affect raptors by altering habitats; physically harming or killing eggs, young, or adults; and by disrupting normal behavior (Postovit and Postovit 1987, Delany et al. 1999 as cited in Morrison et al. 2011). A recent study on nesting northern goshawk response to logging truck noise found that while goshawks alerted (turned their head in the direction of the noise) to the noise, they did not flush and response was inversely proportional to the distance of the nest from the road (Grubb et al. 2012).

Little is known about the goshawk's sensitivity or responses to human disturbance (Dunk et al. 2011). Human disturbance, including noise disturbance generated by OSVs and associated trail grooming equipment, could cause goshawks to abandon nests during the nesting and post-fledging period (February 15 through September 15). As a result, Dunk et al. (2011) experimentally tested whether ATVs and hikers disturb goshawks in Plumas National Forest of the Sierra Nevada. More specifically, they analyzed whether there was evidence of an effect of ATVs or hikers on the behavior or reproduction of goshawks. Given the absence of OSV/goshawk studies, this study is the closest to potential for disturbance from OSV use because sound levels are similar. ATVs in this study produced sound in the range of 70 to 110 dBA; noise from snowmobiles manufactured after June 30, 1976, have a noise emission of 73 dBA at 50 feet while traveling at 15 mph, when tested under SAE J1161 procedures,[21] and noise generated by snowplows and snowcats used for OSV program operations ranges from 80 to 85 dBA[22] (California OSV Program Final EIR (2010)). Dunk et al. (2011) evaluated the potential effects of three kinds of recreational activity: (1) sustained activity by ATVs on roads near nests and fledglings (Sustained-ATV experiments), (2) direct approaches by ATVs or hikers toward nests (Direct-approach experiments), and (3) sustained activity below nests by hikers and a dog (Intensive-hiker experiments). For the purpose of this analysis, we will focus on Sustained-ATV experiments for nesting goshawks, because the OSV use period is outside of the fledgling period, and Direct-approach ATV experiments.

Sustained-ATV treatments were designed to evaluate whether, and how, nesting goshawks and their young respond to sound from ATVs operated on nearby roads. Treatments consisted of driving an ATV for approximately 1 hour back and forth on transects on established roads near the nest, exposing the nest to multiple ATV passes during each treatment. Each sustained-ATV treatment during the nesting phase consisted of two portions: slower driving (approximately 16 kilometers per hour) and faster driving (approximately 24 to 32 kilometers per hour) to expose goshawks to a realistic variety of sound levels associated with ATV use on these kinds of roads.

Three potential metrics of ATV impacts on goshawks were used to compare sustained-ATV treatment and control territories: (1) percentage of time females spent off the nest, (2) frequency of kekking [calls are also typically associated with alarm or agonism in goshawks (Squires and Reynolds 1997)] bouts, and (3) frequency of prey deliveries. There were no significant differences in the mean percentage of time that females spent off nests, mean number of kekking bouts, or mean number of prey deliveries per hour during control experiments and during sustained-ATV treatments. However, a significant difference between treatment and control territories in the percentage of time that female goshawks spent off the nest during the treatment/control hour and the pre-treatment/control hour was found. This was interpreted to mean that sustained ATV use near nests had an effect on goshawks. However, based on the researchers' extensive personal observations, the kind of activity goshawks were exposed to during sustained-ATV treatments was more intensive than was typical recreational use of ATVs on the Plumas National Forest. The same would be expected of OSV use on the Lassen National Forest.

The ATV used in direct nest approaches followed a pre-determined transect that, at its midpoint, passed directly below or as close as possible to the nest, and then returned by the same route. The

[21] This is the equivalent of a single passenger vehicle or motorcycle on a roadway. A snowmobile under full throttle emits the same sound level as a truck pulling a camper at a constant highway speed applying very little throttle. In a worst case scenario, a snowmobile leaving a stop sign and applying full throttle, the noise produced is still about the same as a passenger vehicle driving down the road (International Snowmobile Manufacturers Association 2008). The effect is audible but not long lasting (California Department of Parks and Recreation 2010).

[22] This is similar to typical construction equipment (backhoe, excavator, grader). Typical hourly average noise levels from this equipment are 75 to 80 dBA at a distance of 100 feet. These noise levels drop off at a rate of 6 dBA per doubling of distance between the noise source and receptor.

total (round-trip) transect length was 800 meters (0.5 mile). Direct-ATV approach treatments did not include slower and faster driving phases. Because they were often located on rough terrain, direct-ATV approaches generally required driving in lower gears at relatively slow speeds. The mean transect duration was 7 minutes (range 4 to 15 minutes). Nesting females did not appear to respond negatively to direct approaches by ATVs.

In addition, Dunk et al. (2011) evaluated whether a relationship existed between the number of young produced by a territory and the type(s) of experiments that occurred within it during that year and whether there was any evidence that the frequency or duration of research activities influenced reproduction. No evidence was found indicating experimental treatments, or research visits in general, influenced goshawk reproduction. Longer-term and more rigorous reproductive data, including physiological data, are needed to fully address whether recreational or research activities can impact goshawk reproduction. However, data suggest that recreational and research activities would have to be more intensive and extensive than those conducted to negatively affect goshawk reproduction (Dunk et al. 2011).

Direct and Indirect Effects

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to goshawk are listed in table 160.

Table 160. Resource indicators and measures for assessing effects to northern goshawk

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals	Acres and percentage of important habitat impacted by OSV use	117,272 (36%)	113,511 (35%)	105,729 (33%)	116,202 (36%)	87,988 (27%)
Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals	Acres and percentage of buffered NGO PACs impacted by OSV use	49,860 (44%)	49,498 (44%)	45,627 (41%)	49,306 (44%)	39,636 (35%)

Northern goshawk is associated with late-successional forests that can be impacted by activities associated with trails. Gaines et al. (2003) conducted a literature review of 71 late-successional forest-associated wildlife species and identified negative effects on these species that can result from route-associated factors. These impacts include direct loss of habitat from type conversion, diminished quality of habitat attributes or fragmentation, and road avoidance or displacement resulting from direct harassment or noise disturbance. Individuals, environmental groups, and agency biologists expressed growing concern over habitat fragmentation for late-successional forest-associated species. Various studies have shown that this species group is vulnerable to disturbance, changes in habitat, or displacement by habitat generalists.

Snowmobile use within late-successional forest habitats can have the following potential direct effects to individuals or their habitat (Gaines et al. 2003): Disturbance and potential for injury or mortality to individuals from vehicle collisions.

Disturbance:

Displacement of populations or individual animals from a route, related to human activities.

Disturbance and displacement of individuals from breeding or rearing habitats.

Physiological response to disturbance, resulting in changes in heart rate or level of stress hormones.

Potential for Injury or Mortality to Individuals from Vehicle Collision:

As previously discussed, the likelihood of a collision between snow grooming equipment and wildlife is extremely low because the equipment travels slowly (3 to 6 mph). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds. However, the potential for this effect on goshawks would be low given that they spend little time at ground level.

Possible indirect effects include:

Altered or dispersed movement as caused by a route or human activities on or near a route.

In addition, Gaines et al. (2003) found an interaction that occurred on winter recreation trails was the indirect effect of snow compaction on the subnivean sites used by small mammals in which small mammals can either be suffocated as a result of the compaction, or their subnivean movements can be altered owing to impenetrable compact snow. Adverse effects to subnivean animals could indirectly affect the prey base for many Forest Service sensitive species, including goshawk.

There are 113,550 acres of ngoPACs, when each of the 172 PACs is buffered by 0.25 mile (map BE-46), and 325,070 acres of goshawk important habitat[23] (map BE-51), including high-reproductive habitat, on the Lassen National Forest.

Activities greater than 0.25 mile (400 meters) from a goshawk nest site to have little potential to affect nesting goshawks[24]. The OSV season overlaps with the courtship through incubation phases of the goshawk breeding season (Woodbridge and Hargis 2006; USDA Forest Service 2010), so snowmobiles passing within 0.25 mile of unsurveyed nesting/roosting habitat or an active nest have the potential to disturb nesting goshawks. Although Dunk et al. (2011) found sustained ATV use near nests had a significant effect on the percentage of time that female goshawks spent off the nest during the treatment, they also noted the kind of activity goshawks were exposed to during sustained-ATV treatments was more intensive than was typical recreational use of ATVs on the Plumas National Forest. The same would be expected of OSV use on the Lassen National Forest. In addition, Dunk et al. (2011) found no evidence indicating experimental treatments, or research visits in general, influenced goshawk reproduction. As previously described in the California spotted owl section, monitoring and analysis specific to California spotted owl and northern goshawk PACs and OSV use was conducted on the Lassen National Forest. Lassen National Forest had 174 northern

[23] Habitat types important for late-successional forest species include stands typed as 4M, 4D, 5M, 5D, and 6 by California Wildlife Habitat Relationship (CWHR 2014), which are all stands of trees greater than 11 inches dbh with greater than 40 percent canopy cover (Sierra Nevada Forest Plan Amendment, USDA Forest Service 2004). PACs buffered by 1 mile from the center point of each PAC were subtracted from the total amount of important habitat, based on Woodbridge and Hargis (2006) to prevent double counting with PAC analysis.

[24] Based on Sierra Nevada Forest Plan amendment standard/guideline #76 that assigns a 0.25-mile LOP around northern goshawk PACs - applicable to disturbance from vegetation management activities

goshawk PACs, at the time, of which 33 (19 percent) were within 400 meters (0.25 mile) of designated OSV trails. Twenty-three northern goshawk PACs fell within the scope of the GIS analysis conducted. No relationship was apparent between a PAC's distance from a snow park and whether it has been recently occupied.

Although the potential for OSV-related noise-based disturbance overlaps with only the early part of the February 15 through September 15 goshawk breeding season, once OSV trail grooming season ends on March 31, trail use declines by roughly 50 percent. Therefore, the potential for direct and indirect effects to ngoPACs within 0.25 mile of groomed trails would decrease by an estimated 50 percent after March 31 for alternatives 1 through 3 (and not long, thereafter, for alternative 4, with the exception of extremely high snowfall years).

Although OSV use or related activities would not physically alter the vegetative structure of goshawk habitat, goshawk prey species that use the subnivean space could be subject to OSV-related impacts from snow compaction, including suffocation or alteration of movement while foraging beneath the snow. The degree of this impact is unknown, but would be more likely in areas most conductive to OSV.

Comparison of the Alternatives

Table 161 and table 162 show and compare, by alternative, the amount of northern goshawk PACs and important habitat, respectively, with the potential for direct (disturbance or displacement, injury or mortality from collision) and indirect (snow compaction effects to subnivean prey) effects, as previously described, and taking slope and canopy cover assumptions into account. Due to the structural nature of important goshawk habitat (i.e., dense forested stands), the level of cross-country travel in goshawk important habitat is less than the amount of available habitat. Ninety-six percent of goshawk PACs buffered by 0.25 mile are currently open to OSV use (alternative 1). However 44 percent is currently open to OSV use and of moderate to high OSV use (table 161; map BE-46). Similarly, 87 percent of important goshawk habitat is currently open to OSV use, but 36 percent is currently open to OSV use and of moderate to high OSV use (table 162; map BE-51). The potential for OSV-related impacts to goshawk, including noise-based disturbance, snow compaction impacting subnivean space of prey species, or injury/mortality, would be most likely to occur in those areas of moderate to high OSV use. In addition, of the 44 percent of buffered activity centers and the 36 percent of important habitat currently open to and of moderate to high OSV use, high OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within in an even smaller percentage of each of those habitats; 52 goshawk PACs buffered by 0.25 mile (30 percent) fall within 0.5 mile of a groomed trail or OSV staging area. This would be similar under the other three alternatives.

Table 161. Acres of goshawk PACs, buffered by 0.25 mile, with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	109,087	107,005	97,437	107,602	86,054
Not Designated for OSV use	4,463	6,444	15,986	5,827	27,403
OSV use restricted to trails	NA	NA	17	NA	17

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Total	113,550 acres				
Designated for OSV use and of moderate to high OSV use (percent of PAC total acres)	49,860 (43.9%)	49,498 (43.6%)	45,627 (40.7%)	49,306 (43.4%)	39,636 (34.9%)
Not Designated for OSV use and of moderate to high OSV use	1,487	1,808	5,674	2,003	11,674
Moderate to high OSV use and OSV use restricted to trails	NA	NA	8	NA	8
Total	51,347 acres				

Under alternative 2, 35 percent of important northern goshawk habitat (map BE-52) and 44 percent of buffered PACs would be designated and of moderate to high OSV use (map BE-38). Similarly, 33 percent of important habitat (map BE-53) and 41 percent of buffered PACs (map BE-39) would be designated and conductive to OSV under alternative 3, and 36 percent of important habitat (map BE-54) and 43 percent of buffered PACs (map BE-49) under alternative 4. Alternative 5 would produce the lowest amount of potential disturbance with 27 percent of important habitat (map BE-55) and 35 percent of buffered PACs designated and of moderate to high OSV use (map BE-50). The forest would use the results of ongoing inventory and monitoring of northern goshawk activity centers to determine whether or not disturbance is occurring and if changes in management are necessary. The potential for noise-based disturbance would largely overlap with roughly the first 20 percent, or the courtship (formation of breeding pairs, nest building, and copulation) phase of the February 15 through September 15 northern goshawk breeding season under alternatives 1, 2, 3, and 5, and may extend up through the first one-third of the breeding season, into the incubation period, under alternative 4. As previously described, once OSV trail grooming season ends on March 31, trail use declines by roughly 50 percent and, therefore, the potential for direct and indirect effects to activity centers within 0.25 mile of groomed trails would decrease by an estimated 50 percent after March 31 for alternatives 1 through 3 (and not long, thereafter, for alternative 4, with the exception of extremely high snowfall years).

Under all of the action alternatives, trail densities would decline from 1.5 mi/m^2 to 0.2 mi/m^2. And, because the majority of OSV use occurs on or within 0.5 mile of groomed trails and staging areas, or within meadows within 0.5 mile of designated trails, the potential for impacts to subnivean prey species, would be expected to decline with reduced trail densities under alternatives 2, 3, 4, and 5.

Table 162. Acres of important goshawk habitat with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	283,075	269,807	247,428	280,113	198,198
Not Designated for OSV use	41,994	55,015	76,953	43,500	126,206
OSV use restricted to trails	NA	NA	40	NA	40
Total	325,070 acres				
Designated for OSV use and of moderate to high OSV use (percent of habitat total)	117,272 (36.1%)	113,511 (34.9%)	105,729 (32.5%)	116,202 (35.7%)	87,988 (27.1%)
Not Designated for OSV use and of moderate to high OSV use	10,551	14,228	21,997	11,352	39,737
Moderate to high OSV use and OSV use restricted to trails	NA	NA	22	NA	22
Total	127,823 acres				

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to goshawk, when combined with alternatives 1, 2, 3, 4, or 5 include vegetation management projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. While thinning or other vegetation treatments have reduced stand densities, management prescriptions have emphasized retention of large snags and logs and retention of large conifer that are important attributes of goshawk habitat.

Goshawk habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. However, wheeled motorized vehicles may not be used off of authorized NFS roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014), there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1 and December 31) and OSV trail grooming season (beginning December 26), and disturbance or displacement from this activity would occur outside of the northern goshawk breeding season under alternatives 1, 2, 3, and 5. Under alternative 4, in which trail grooming would begin at the discretion of the groomer, there is the potential for a somewhat larger degree of overlap during years in which heavy snowfall begins early. Use of roads within goshawk habitats after the March 31 termination date of the forest order closing roads for exclusive OSV use can contribute additional disturbance during the early part of the goshawk breeding season, particularly for nests within 0.25 mile of roads. However, current research shows no evidence that recreational vehicle use influences goshawk reproduction. In general, most non-motorized winter recreation occurs along designated trails, and northern goshawk would either avoid roosting in those areas, if too great a disturbance, or habituate to the noise. Similar activities on State and private lands within the forest boundary and within 0.25 mile of goshawk habitats may impact habitat availability outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown; State and privately held lands make up about 20 percent of the area within the forest boundary. In summary, ongoing and reasonably foreseeable actions may be additive locally to individual

goshawks, but are not expected to contribute substantial impacts to those discussed for the project under any of the alternatives.

Determination Statement

Alternatives 1, 2, 3, 4, and 5 of the Lassen National Forest Over-snow Vehicle Use Designation Project may affect individuals, but are not likely to lead to a trend toward Federal listing or loss of viability for northern goshawk in the project area based on the following rationale:

- Vegetative structure or composition of habitat would not be physically modified by OSV use and related activities under any of the alternatives.
- Due to the structural nature of suitable habitat (i.e., dense forested stands), the level of cross-country OSV travel in northern goshawk suitable habitat is expected to be relatively low, and most disturbance is likely to occur primarily along existing roads and trails under all alternatives.
- Although the potential for noise-based disturbance to individuals within important habitat ranges from 27 to 36 percent, and individuals within buffered PACs ranges from 35 to 44 percent, under all of the alternatives, the percentage of habitats impacted would actually be lower considering that the concentration of OSV use is not equal across the landscape; 30 percent of buffered goshawk PACs fall within 0.5 mile of a groomed trail or OSV staging area, the highest OSV use areas.
- The potential for OSV-related noise-based disturbance would overlap with only the early part of the February 15 through September 15 goshawk breeding season.
- OSV use is most common on trails and once OSV trail grooming season ends on March 31, trail use declines by roughly 50 percent. As a result, the potential for direct and indirect effects to ngoPACs within 0.25 mile of groomed trails would decrease by an estimated 50 percent after March 31 for alternatives 1 through 3 and 5 (and not long, thereafter, for alternative 4, with the exception of extremely high snowfall years).
- The forest would use the results of ongoing inventory and monitoring of goshawk nest sites to determine whether or not disturbance is occurring and if changes in management are necessary.
- Lassen National Forest monitoring found no apparent relationship between an ngoPAC's distance from a snow park and whether it was recently occupied, and Dunk et al. (2011) found no evidence indicating experimental recreational treatments influenced goshawk reproduction.

The potential for OSV collision with individual northern goshawks is very low.

Wide-ranging Carnivores

Sierra Nevada Red Fox (*Vulpes vulpes necator*), Southern Cascades Distinct Population Segment (DPS)

Candidate Species; Regional Foresters Sensitive Species

The Fish and Wildlife Service recently released its 12-month finding on a petition to list Sierra Nevada red fox as threatened or endangered (USDI Fish and Wildlife Service 2015c). In addition, the Service released a Sierra Nevada red fox species report (USDI Fish and Wildlife Service 2015b), a comprehensive summary of known information about the subspecies based on existing literature to date. Therefore, an excerpted version of the 12-month finding, with information relevant to the

subspecies and its habitat on the Lassen National Forest from the species report will serve as the Sierra Nevada red fox subspecies account and existing condition information. Similarly, excerpted relevant stressors to the subspecies identified in the species report are identified below.

Species Account

Perrine et al. (2010, p. 9) concluded that Sierra Nevada red fox likely occur at low population densities even within areas of high relative abundance. Following publication of the Fish and Wildlife Service 90-day finding in the Federal Register (77 FR 45; January 3, 2012), the Sierra Nevada red fox's range was confirmed (via a combination of genetics and photographic evidence) to extend into the Oregon Cascades as far north as Mt. Hood, significantly extending the subspecies' range beyond its historically known range in California. Specifically, five sighting areas (clustered locations of recent Sierra Nevada red fox sightings) have been identified on Federal lands in Oregon where surveys have occurred, in addition to the two known sighting areas in California as described in the 90-day finding (77 FR 45). Sierra Nevada red fox are thus known from a total of seven sighting areas, located in the vicinity of (north to south) Mt. Hood, Mt. Washington, Dutchman Flat, Willamette Pass, and Crater Lake in Oregon; and Lassen and Sonora Pass in California.

The Fish and Wildlife Service found the areas occupied by the Sierra Nevada red fox within the Southern Cascades and Sierra Nevada Mountain Ranges are separated by a geologic gap in the range. The best available data indicate this gap represents a lack of population connectivity between the two geographic areas. This separation is further supported by recent genetic studies which demonstrate that the two closest sighting areas (known populations that reside at the Lassen and Sonora Pass sighting areas) show genetic differences, and there is no indication of gene flow between these populations. Therefore, the Fish and Wildlife Service concluded that the two areas are discrete under their distinct population segment policy. In conclusion, the Southern Cascades distinct population segment includes the Cascade Mountains of Oregon from the Columbia River south into the California Cascades around Lassen Peak, including Lassen National Forest, and the Sierra Nevada distinct population segment includes the upper elevations of the Sierra Nevada Mountain Range from Tulare to Sierra Counties, including Stanislaus National Forest. Sierra Nevada red fox likely occur at low population densities even within areas of high relative abundance (Perrine et al. 2010). In its 12-month finding (USDI Fish and Wildlife Service 2015c) the Service found that listing of the Sierra Nevada DPS was warranted. However, listing of the Southern Cascades DPS was not warranted at the time.

The Lassen sighting area includes lands managed by Lassen National Forest and Lassen Volcanic National Park (including the Caribou Wilderness), and some private inholdings primarily as timberlands (USDI Fish and Wildlife Service 2015b). Sacks et al. (2010, pp. 1532, 1536–1537) estimated that the effective size of the population at the Lassen sighting area (referred to in the study as the modern Southern Cascades population) is 21 breeding individuals, with a 95 percent confidence interval of 13 to 34 breeding individuals (see also Statham et al. 2012, pp. 122, 123). The "effective size" of the population refers to the number of breeding individuals in an "ideal" population (with discreet, non-overlapping generations, equal contribution of all members to the next generation, and free mixing prior to mate choice) that experiences the same amount of genetic drift (random change in gene frequencies) as the actual population (Lande and Barrowclough 1987, pp. 88–89). Actual Sierra Nevada red fox populations are likely to be somewhat larger than their effective population sizes because they include non-breeding individuals, including pups, and (possibly) adult offspring remaining on their parent's territory to help raise their siblings. Such "helpers" are not uncommon in other red fox subspecies, though clear evidence of them has not been demonstrated in Sierra Nevada red fox (Sacks et al. 2015, pp. 1–2). A high-end estimate of actual

population size for the Lassen sighting area might therefore assume two non-breeders for every breeder, resulting in a total population of about 63 individuals (Sacks et al. 2015, p. 2).

Systematic carnivore surveys conducted from 1996 to 2002 throughout the Sierra Nevada and Cascades Mountains of California detected no Sierra Nevada red fox (Zielinski et al. 2005, pp. 1385, 1387), indicating the subspecies was likely extirpated or in low densities in the regions sampled; according to figures 1 and 3 in Zielinski et al. (2005, pp. 1387, 1389), the currently known Lassen sighting area was within the 1996 to 2002 sampling area. The population levels of Sierra Nevada red fox at that time were unknown, but the subspecies was believed to occur at very low density (Perrine et al. 2010, p. 9).

California Department of Fish and Wildlife (CDFW) obtained 187 Sierra Nevada red fox scat and hair samples from the Lassen sighting area between 2007 and 2013, and was able to genetically identify 18 separate individuals from those samples (USDI Fish and Wildlife Service 2015b), thereby tending to support the low effective population size estimate (i.e., 21 breeding individuals) of Sacks et al. (2010, p. 1532). CDFW was also able to identify the source individuals for over 100 Sierra Nevada red fox genetic samples collected within the Caribou Wilderness (immediately east of Lassen Volcanic National Park within the sighting area) in 2012 and 2013, finding that no new individuals (i.e., offspring) entered the population within the study area during those years (USDI Fish and Wildlife Service 2015b). Thus, successful reproduction in that portion of the sighting area during those years was low or nonexistent. However, CDFW cameras did photograph a Sierra Nevada red fox near the Caribou Wilderness in 2009 that appeared visibly pregnant (USDI Fish and Wildlife Service 2015b).

Habitat Status

Sierra Nevada red fox use multiple habitat types in the alpine and subalpine zones (near and above treeline) (California Department of Fish and Game (CDFG) 1987, p. 3). In addition to meadows and rocky areas (U.S. Department of Agriculture, Forest Service (USDA Forest Service) 2009, p. 506), Sierra Nevada red fox use high-elevation conifer habitat of various types (Perrine 2005, pp. 63–64). Nearest the treeline in the Lassen sighting area, where habitat use has been best documented, the subspecies frequents subalpine conifer habitat dominated by whitebark pine (*Pinus albicaulis*) and mountain hemlock (*Tsuga mertensiana*) (Perrine 2005, pp. 6, 63–64.

Sierra Nevada red fox in Oregon and at the Lassen sighting area in California, have also been found to descend during winter months into high-elevation conifer areas below the subalpine zone (Perrine 2005, pp. 63–64). In the Lassen sighting area, this habitat consists primarily of red fir (*Abies magnifica*), white fir (*Abies concolor*), and lodgepole pine (*Pinus contorta*) (Perrine 2005, pp. 63–64). Winter sightings have occurred as low as 1,410 meters (4,626 feet) in the Lassen sighting area (Perrine 2005, pp. 2, 162), and 1,280 meters (4,200 feet) in Oregon. Possible reasons for this elevational migration include lessened snow depths at lower elevations (Perrine 2005, pp. 80, 81), unsuccessful dispersal movements by nonbreeding individuals (Statham et al. 2012, p. 130), and lack of suitable prey at high elevations in the Lassen area (Perrine 2005, p. 30). While on these lower winter ranges, the subspecies has shown a preference for mature closed canopy conifer forests, despite the rarity of this forest structural category (less than 7 percent) in the area studied (Perrine 2005, pp. 67, 74, 90). Similar elevational migrations are not known for the Sonora Pass sighting area (Statham et al. 2012, p. 130).

Dispersal distances have not been documented for Sierra Nevada red fox, but one study found juvenile male red foxes in the American Midwest dispersed 30 kilometers (18.6 miles) on average, while juvenile females dispersed an average of 10 kilometers (6.2 miles) (Statham et al. 2012, p.

130). A few young American Midwest red foxes (5 percent) dispersed over 80 kilometers (50 miles) in their first year (Statham et al. 2012, p. 130).

Although little direct information exists regarding the Sierra Nevada red fox's reproductive biology, there is no evidence to suggest it is markedly different from lowland-dwelling North American red fox subspecies (Aubry 1997, p. 57). Those subspecies are predominately monogamous and mate over several weeks in the late winter and early spring (Aubry 1997, p. 57). The gestation period for North American red fox is 51 to 53 days, with birth occurring from March through May in sheltered dens (Perrine et al. 2010, p. 14). Sierra Nevada red fox use natural openings in rock piles at the base of cliffs and slopes as denning sites. They may also dig earthen dens similar to Cascade red foxes (although this has not been directly documented) (Aubry 1997, p. 58; Perrine 2005, p. 153). There are no documented Sierra Nevada red fox den sites on the Lassen National Forest.

Sierra Nevada red fox appear to be opportunistic predators and foragers, with a diet primarily composed of small rodents, but also including deer carrion (*Odocoileus hemionus*) (particularly in winter and spring) and manzanita berries (*Arctostaphylos nevadensis*) (particularly in fall) (Perrine et al. 2010, pp. 24, 30, 32–33). Sierra Nevada red fox are most active at dusk and at night (Perrine 2005, p. 114), when many rodents are most active. High-elevation lagomorphs, such as snowshoe hare (*Lepus americanus*) and pika (*Ochotona princeps*), also are diet components of the subspecies, although they were not an important food source in the Lassen sighting area, possibly due to scarcity in the region (Perrine 2005, pp. 29–30).Home range sizes of Sierra Nevada red fox have not been studied throughout the range of the subspecies. However, Perrine (2005, pp. 2, 159) found within a portion of the Lassen sighting area that adult Sierra Nevada red fox established summer home ranges averaging 2,564 hectares (6,336 acres), with individual home ranges ranging from 262 hectares (647 acres) to 6,981 hectares (17,250 acres) (Perrine 2005, pp. 2, 159). Winter home ranges were larger, averaging 3,255 hectares (8,042 acres) and ranging from 326 to 6,685 hectares (806 to 16,519 acres) (Perrine 2005, p. 159). For this analysis, a total of 103,803 acres of suitable Sierra Nevada red fox habitat[25] is found within the project area (table 164, page 514; map BE-56).

Based upon Sierra Nevada red fox monitoring conducted on the Lassen National Forest in 2012, interaction between Sierra Nevada red fox and OSV enthusiasts was considered to be unlikely due to inverse differences in peak activity hours, with peak activity for the fox occurring from approximately 2 hours after sunset until 2 hours prior to sunrise (Perrine 2005), while almost all OSV usage occurs during daylight hours. However, because there is considerable uncertainty about effects to this species, current direction requires project analysis within a 5-mile radius of any verified detection of Sierra Nevada red fox. If necessary, a limited operating period is applied from January 1 to June 30 to avoid adverse impacts to breeding sites (USDA Forest Service 2001, 2004).

General Potential Threats (Stressors)

Potential threats that may impact the subspecies in Oregon and California are those actions that may affect individuals or sighting areas either currently or in the future, including: wildfire and fire suppression; climate change; hunting and trapping; disease (including salmon poisoning disease, elokomin fluke fever, and possibly mange, distemper, or rabies); competition and predation by coyotes, which could be exacerbated in the future depending on climate change impacts to habitat; predation by domestic dogs; hybridization with nonnative red fox; vehicles; and small population

[25] Based upon Cleve et al. (2011): The model used occurrence data from the Lassen Peak region population combined with climatic and remotely sensed variables (December minimum temperature, February precipitation, greenness, distance to water). The Maxent MSB model was the best model for the Lassen Peak region, including Lassen National Forest. Suitable habitat is defined as the area that contains the probability of red fox occurrence ≥ the optimum cutoff value of 0.157. See Cleve et al. (2011) for additional information.

size and isolation, specifically for the Lassen and Sonora Pass sighting areas. Possible impacts associated with logging or vegetation management and grazing were evaluated, but found to result in low or no impacts, overall, across the subspecies' range. Due to regulatory protections, hunting and trapping do not constitute a current or likely future stressor to Sierra Nevada populations in California. Salmon poisoning disease, elokomin fluke fever, and other diseases were found to constitute stressors with low levels of impact (i.e., applicable to individuals rather than populations).

Relevant Potential Stressors

Small Population Size and Isolation

The effective size of the Lassen Sierra Nevada red fox population is estimated at 21 breeding individuals. Since this is considerably less than an effective population size of 50, inbreeding depression may be an issue in the population, now or in the future. Potential inbreeding depression at the Lassen sighting area is also unlikely to be avoided through interbreeding with other populations. The nearest Sierra Nevada red fox sighting area to the Lassen population is at Sonora Pass, but the distance between them (100 kilometers (62 miles) straight-line distance) is greater than 95 percent of dispersal distances recorded for lowland North American red foxes (80 kilometers (50 miles)) (Statham et al. 2012, p. 129). Genetic testing also provides no evidence of migration between the Lassen and Sonora Pass populations (Statham et al. 2012, p. 129). The population is thus both small and highly isolated from other Sierra Nevada red fox.

The actual size of the Lassen population is likely to be somewhere between 21 and 63 individuals, depending on the number of nonbreeding individuals present (Sacks et al. 2010, p. 1536; Sacks 2015, p. 1). Such a small population is at risk from deleterious chance events, such as major storms or epidemics that can harm or kill relatively large numbers of Sierra Nevada red fox. We do not have information regarding how often such chance events occur, but consider at least one such event likely within the next 50 years.

Although no current impacts are clearly attributable to small population size or isolation, physiological examination of four adult females from the Lassen population, captured in 2000 for a radio telemetry study, showed they had not reproduced, either before or during the 2-year study, despite the overlap of their ranges with a collared male (Perrine 2005, pp. 141, 164). Low reproductive success is a common result of inbreeding depression, although other possible explanations exist, such as low prey availability at higher elevations (Perrine et al. 2010, p. 5).

The small size and high isolation of the Lassen population make future impacts likely from inbreeding depression or chance deleterious events. The population will remain vulnerable to such threats so long as it stays small and isolated, but based on observed reproductive output and on a lack of evidence for nearby Sierra Nevada red fox populations, it appears likely to remain small and isolated for at least the next 50 years.

Based on the best available information, the Fish and Wildlife Service found this stressor has, or is likely to have within 50 years, population-level impacts at the Lassen and Sonora Pass sighting areas, but does not have subspecies-level impacts. Therefore, the Service concluded that "Small Population Size and Isolation" is a stressor with medium-level impacts to Sierra Nevada red fox.

Vehicles

Potential stressors related to vehicles (including cars, trucks, snowmobiles, and other OHV equipment) include direct impacts, disturbance from noise, and disruption of prey such as rodents living below the surface of the snow. Vehicles may also provide some benefits to Sierra Nevada red

fox by providing roads and compacted snow trails for travel, and occasional road-killed animals for scavenging.

The only known incidents of vehicle impacts with Sierra Nevada red fox are relatively recent. Since 2010, five individuals have been reported killed by vehicles, including within the Sonora Pass sighting area (California State Hwy. 395), the Crater Lake sighting area (main Park road near administration building), two in the Mt. Washington sighting area, and one near Silver Lake, Oregon, about 80 kilometers (50 miles) west of the Crater Lake sighting area (USDI Fish and Wildlife Service 2015b).

Sierra Nevada red fox in the Lassen sighting area commonly use roads to travel on (Perrine 2005, p. 85), so the extent to which a given road is beneficial or detrimental may depend on traffic, particularly during dusk, dawn, and at night when foxes are most active (Perrine 2005, p. 110). Most OSV use occurs during daylight hours (primarily from 10:00 a.m. to 3:00 p.m.) when foxes are least active. Injury or mortality due to collision with OSVs is possible. However, during the past 30 years of OSV use within the project area, which has consisted of both trail and cross-country use, no such incidents are known to have occurred. The lack of past evidence of OSVs causing injury or mortality, in addition to the general segregation of daily activity patterns between foxes and OSVs create a low risk of impacts to the population within the project area. Grooming operations conducted using snowcats normally take place at night, thereby overlapping with daily activity periods for Sierra Nevada red fox. Snowcats are operated at speeds in the range of 3 to 6 miles per hour. The vehicle is relatively loud and operates with warning lights on at all times. Given these factors, risk of injury or mortality to Sierra Nevada red fox resulting from collisions with grooming vehicles is low.

All of the Sierra Nevada red fox sighting areas have moderate to extensive opportunities for OHV, snowmobile, and on-road vehicular traffic. Although no studies have been completed, the mere location of the sightings in these areas suggests that the foxes are able to adjust to the noise involved, and that sufficient prey remain in such areas.

Sierra Nevada red foxes are known to frequent OSV snow parks and show begging behavior for available food. This behavior can increase risk of injury or death due to vehicle strikes, ingestion of toxic materials, or attack by domestic dogs (Perrine 2005).

Human Disturbance

Available science addressing response of Sierra Nevada red fox to human presence and disturbance is somewhat mixed. Buskirk and Zielinski (2003) state that “The Sierra Nevada red fox has been considered extremely sensitive to the presence of humans (Grinnell et al. 1937) so that increased recreation within its range could be problematic.” Since Grinnell et al. (1937), more recent science indicates that Sierra Nevada red fox may not be extremely sensitive to human presence and may habituate to humans. For example, Perrine et al. (2010, pg. 28) state that “Risks from recreation are primarily associated with developments such as ski areas, snow parks, campgrounds, and picnic areas. In campgrounds without bear boxes, where campers' food and trash are more accessible, red foxes can develop begging habits and thereby increase the possibility for conflict with humans. They may be particularly susceptible in mountainous regions where natural productivity is low and winter food is scarce. Begging foxes have been a periodic problem in Lassen Volcanic National Park and the adjacent Lassen National Forest” (Perrine 2005). Perrine (2005) reported that Lassen red foxes were closely associated with roads, parking lots (including snowmobile parks) and campgrounds during both summer and winter, but responses of individual foxes to human recreation sites varied

from one individual that scavenged at a recreation site only at night to several individuals that were characterized as bold and often approached humans and vehicles during the day.

Competition and Predation from Coyotes

Both coyote and Sierra Nevada red fox are opportunistic predators with considerable overlap in food consumed (Perrine 2005, pp. 36–37). Although no direct documentation of coyote predation on red foxes is available, coyotes will chase and occasionally kill other North American red fox subspecies, and are considered important competitors of red fox generally (Perrine 2005, pp. 36, 55; Perrine et al. 2010, p. 17). Red foxes consequently tend to avoid areas frequented by coyotes (though not necessarily to the point of complete exclusion) (Perrine 2005, p. 55). Perrine's (2005, pp. 73–74) investigations at Lassen found coyotes were present at all elevations during the summer months, and that a positive correlation actually existed between Sierra Nevada red fox and coyotes during those times (Id. at 83). Since the correlation was only evident at broader scales, however, he considered it a likely artifact of their common affinity for roads (Id.). Even during snow-free months, however, Perrine found coyote population density to be greater at lower elevations, thus producing an elevational separation between most coyotes and the Sierra Nevada red fox population (Id. at 192).

During the winter season, Perrine (2005, pp. 30, 78) found that both Sierra Nevada red fox and coyotes descended to lower elevations, where mule deer (*Odocoileus hemionus*), (and more specifically in the case of Sierra Nevada red fox, mule deer carrion) became important components of their diets. However, foxes tended to stay at higher elevations than coyotes, thereby reducing potential for competition (Id. at 74). Perrine (Id. at 80–81) attributed the elevational descent of both species to very deep snowpacks at higher elevations. Sierra Nevada red fox are better able than coyotes to live in areas of relatively deep snow, however, and thus, tend to remain at higher elevations where coyotes are less common during winter months. Sierra Nevada red fox may also benefit from the presence of coyotes during winter by scavenging deer carcasses killed by coyotes (Perrine 2005, p. 31). Mule deer carrion may be more important to foxes in the Lassen sighting area than in other locations due to the lack of mid-sized winter prey such as snowshoe hare (Perrine 2005, p. 30). Mule deer was a relatively minor dietary component of Cascade foxes in Washington and of red foxes in Maine, where snowshoe hares were more available (Id. at 30–31). Even in the Lassen sighting area, Perrine (2005, p. 24) found that the main food source of Sierra Nevada red fox during the winter remained small rodents rather than deer.

The general tendency of red foxes to avoid coyotes has likely been an important factor determining red fox distribution, often relegating red foxes to suboptimal habitats (Perrine et al. 2010, p. 20; Sacks et al. 2010, p. 17). As Perrine (2005, pp. 84, 105) suggested, competition and predation from coyotes is thus likely a primary reason why the range of Sierra Nevada red fox is restricted to such high elevations. However, such competition likely varies in intensity with prey availability, such that at least in the Lassen area studied, it is stronger in winter. We therefore consider coyotes a likely determining factor of the historical lower elevational range of the Sierra Nevada red fox.

Although, as discussed above, competition and predation from coyotes may be an important factor restricting the lower elevational range of the Sierra Nevada red fox, we lack evidence to show that such competition has been increasing in recent years at Lassen, or the extent (if any) to which it may be responsible for recent declines in Sierra Nevada red fox population numbers (as described by Sacks et al. 2010, p. 1536). However, as climate change progresses, snowpacks are expected to diminish (Kapnick and Hall 2010, pp. 3446, 3448; Halofsky et al. 2011, p. 21). The greater disadvantage of coyotes relative to foxes in deep snow is likely the primary reason the two species segregate elevationally during the winter (Perrine 2005, p. 81). As snowpack depths decline, coyotes are likely to stay longer and return earlier to higher elevations, eventually becoming resident there.

Sierra Nevada red fox raise their pups in the spring, while snowpacks are just beginning to recede (Id. at 192). This is also the time of greatest resource scarcity (Id. at 193).

Food availability is important for successful reproduction (Id.), so additional competition and predation from coyotes during this time would likely lower reproductive success. Examinations of four female Sierra Nevada red fox that were radio-collared and followed for 2 years in the Lassen region showed that none had successfully reproduced (Id. at 113, 116), so reproductive success already appears to be low. Increased competition and predation from coyotes due to climate change is thus likely to put the population at greater risk over the next 50 years.

The Fish and Wildlife Service expects that climate change will increase coyote competition at the Mt. Hood, Lassen, and Sonora Pass sighting areas in the future, as snowpacks diminish. However, that competition is likely to be checked at the Crater Lake sighting area by the establishment of wolf populations, which may also decrease coyote competition at the Willamette Pass, Dutchman Flat, and Mt. Washington sighting areas. Sierra Nevada red fox at the four Oregon sighting areas north of Crater Lake may also be able to avoid coyote competition by moving upward in elevation to areas with higher snowpacks. Such upward movement will be less likely for Sierra Nevada red fox at the Lassen, and Sonora Pass sighting areas, as these populations already appear to be at or near the highest elevations in their respective areas. Accordingly, based on the best available information, we therefore, expect increases in coyote competition to have population-level impacts to populations at the Sonora Pass and Lassen sighting areas within the next 50 years, but not to have impacts that are subspecies-wide. The Service, therefore, considers competition and predation from coyotes to constitute a stressor with a medium-level impact for Sierra Nevada red fox.

Climate Change

Potential climate change impacts to Sierra Nevada red fox in the Lassen sighting area include loss of habitat and reduced snowpack (see above). As previously stated, reduced snowpacks may increase the future risk of competition from coyotes. Red foxes have been sighted in the area at elevations ranging from 1,410 meters (4,626 feet) to 3,130 meters (10,269 feet) (Perrine 2005, p. 162). This is a wide range compared to other sighting locations, but it extends up to nearly the highest elevation in the area: Lassen Peak is 3,189 meters (10,463 feet). Accordingly, as climate change causes losses to snowpacks and forested ecosystems, the preferred habitat for Sierra Nevada red fox RF will tend to shrink. Sierra Nevada red fox at Lassen have also demonstrated the strongest affinity for mature closed-canopy forests (during the winter) (Perrine 2005, pp. 67, 74, 90), and so may be particularly impacted by forest losses due to climate change.

Climate change is also causing increased wildfires, and loss of forested habitat resulting from wildfires, drought stress, and pathogen and insect outbreaks. These losses will likely continue over the next 50 years throughout the Sierra Nevada red fox range, likely resulting in medium-level impacts at all sighting areas.

Cumulative and Synergistic Impacts

Certain combinations of stressors may result in cumulative or synergistic impacts that go beyond what might be expected from simply adding the impacts of each individual stressor. The potential stressors most likely to produce cumulative or synergistic effects with other potential stressors are “Small Population Size” and “Climate Change.” The most important cumulative or synergistic effects involve the interactions of these potential stressors with “Competition and Predation from Coyotes.”

Direct and Indirect Effects

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to Sierra Nevada red fox are listed in table 163.

Table 163. Resource indicators and measures for assessment of effects to Sierra Nevada red fox

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from Noise and increased human presence, injury or mortality of individuals, habitat modification, or snow compaction near denning sites	Acres and percentage of suitable Sierra Nevada red fox habitat[26] impacted by OSV use	32,986 (32%)	31,199 (30%)	28,794 (28%)	30,990 (30%)	27,699 (27%)

Gray wolf, Sierra Nevada red fox, and California wolverine are sensitive to the presence of humans and human activities. The most common interactions between snowmobile trails and wildlife that Gaines et al. (2003) documented from the literature included trapping as facilitated by winter human access, disturbance-based displacement and avoidance, and disturbance at a specific site, usually wintering areas. To a lesser degree, hunting, trapping, poaching, collection, and habitat loss and fragmentation were other interactions identified. Trapping of Sierra Nevada red fox, or any of the special-status species under consideration, is not legal in California and, therefore, will not be considered as a potential impact in this analysis.

Snowmobile use and associated activities within habitats for wide-ranging carnivores can have the following potential effects to individuals or their habitat (Gaines et al. 2003). Potential direct effects include (1) Displacement or avoidance away from human activity on or near roads; (2) Displacement of individual animals from breeding or rearing habitat; and (3) Physiological response to disturbance resulting in changes in heart rate or level of stress hormones.

There is also potential for injury or mortality to individuals from vehicle collision or OSV-related snow compaction because Sierra Nevada red fox dens under the snow. As previously discussed, the likelihood of a collision between snow grooming equipment and wildlife is extremely low because the equipment travels slowly (3 to 6 mph). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds. Vehicle collision with a Sierra Nevada red fox or wolverine would negatively affect that particular animal, but the likelihood of occurrence is assumed to be rare.

Possible indirect effects include behavioral modification such as altered or dispersed movement as caused by a trail or human activities on or near a trail and, secondarily, creation of a vector pathway for competitors or predators.

OSV use and related activities would not physically modify the vegetative structure of Sierra Nevada red fox habitat. No studies have been conducted on OSV use related to this population at the current time. However, in its finding (USDI Fish and Wildlife Service 2015c), the USFWS analyzed

[26] Based on Cleve et al. (2011)

potential stressors on the subspecies, including those that may be caused or exacerbated by OSV use, such as competition and predation by coyotes and vehicle collisions.

Potential for Injury or Mortality to Individuals from Vehicle Collision:

As previously discussed, In addition, the best available information suggests no significant increases in vehicular traffic or new roads are likely in areas where the subspecies occurs. Therefore, based on the information presented above and in the Species Report (USDI Fish and Wildlife Service 2015b, pp. 53–55), the best available data indicate that the impact of vehicle collisions on Sierra Nevada red fox would be minor and continue at similar levels into the future, resulting in a low-level impact on the subspecies (i.e., impacts to individual Sierra Nevada red foxes as opposed to populations).

Habitat Modification: (USDI Fish and Wildlife Service 2015b, unless otherwise noted):

Both coyotes and Sierra Nevada red foxes are opportunistic predators with considerable overlap in food consumed (Perrine 2005, pp. 36–37). Perrine (2005, pp. 84, 105) suggests that competition with coyotes, as well as predation, is likely a primary reason why the range of Sierra Nevada red fox is restricted to such high elevations. Any competition likely varies in intensity with prey availability, specifically in the Lassen sighting area where competition may be stronger during winter months when Sierra Nevada red fox descend in elevation.

Coyotes occur throughout the current range of the Sierra Nevada red fox, but typically at lower elevations during winter and early spring when snowpacks are high. If snowpacks are reduced in the area because of climate change, coyotes would likely encroach into high-elevation areas during early spring when Sierra Nevada red fox are establishing territories and raising pups. Even in the absence of direct predation, the tendency of coyotes to chase off red foxes, generally, and to compete with Sierra Nevada red fox for prey, may interfere with the ability of the subspecies to successfully raise offspring (USDI Fish and Wildlife Service 2015b, pp. 48–51).

Overall, the potential increase of coyote competition as it relates to shifting or modified habitats, or diminished snowpack levels from potential climate change impacts, may still occur throughout the range of the subspecies. The best available data indicate presence of coyotes at the same elevations as Sierra Nevada red fox during certain times of the year; however, there is no information to indicate any population-level impacts.

Sierra Nevada red fox could also be predated by coyotes. Sierra Nevada red fox and coyotes both are opportunistic predators with considerable overlap in food consumed (Perrine 2005, pp. 36–37). Although no direct documentation of coyote predation on Sierra Nevada red fox is available, coyotes will chase and occasionally kill other North American red fox subspecies, and are considered important competitors of red fox generally (Perrine 2005, pp. 36, 55; Perrine et al. 2010, p. 17). Thus, red foxes tend to avoid areas frequented by coyotes (though not necessarily to the point of complete exclusion) (Perrine 2005, p. 55).

The general tendency of red foxes to avoid coyotes often relegates them to suboptimal habitats and has likely been an important factor determining red fox distribution (Perrine 2010, p. 20; Sacks et al. 2010, p. 17). Perrine (2005, pp. 84, 105) suggests that predation (and competition; see above) from coyotes is likely a primary reason why the range of Sierra Nevada red fox is restricted to such high elevations.

During winter months in the Lassen sighting area, Perrine (2005, pp. 30, 78) found that both Sierra Nevada red fox and coyotes descended to lower elevations, where mule deer (*Odocoileus hemionus*) (and more specifically in the case of Sierra Nevada red fox, mule deer carrion) became important

components of their diets. Perrine (2005, p. 31) also notes that Sierra Nevada red fox may potentially benefit from the presence of coyotes during winter by scavenging carcasses of deer killed by coyotes. However, Sierra Nevada red fox, whose main winter food source (at the Lassen study site) was small rodents rather than deer (Perrine 2005, p. 24), tend to stay at higher elevations than coyotes, thereby reducing potential predation.

Bunnell et al. (2006) reported that trails as routes for competitors and predators on packed trails resulting from snowmobile use facilitate coyote incursion into deep snow areas and can negatively impact other mammal populations through increased competition or predation. In contrast, Kolbe et al. (2007) reported from a study in western Montana that although roads and trails compacted by snowmobile use were readily available, only a small portion of coyote travel was on compacted snow surfaces. And, while coyotes did use compacted snow more than random expectation, it is unlikely that snowmobile trails strongly affected their movements. They found no difference in use of compacted or uncompacted forest roads, suggesting that coyotes may select for the clear corridor afforded by a road rather than the snow conditions on them.

It is unknown if or how much competition or predation on Sierra Nevada red fox is occurring on the Lassen National Forest as the result of OSV-related snow compaction or other OSV-related activities, including grooming. At this time, the best available data indicate that coyotes are present year-round throughout the subspecies' range, but generally at lower elevations than Sierra Nevada red fox during winter and early spring when snowpacks are high (USDI Fish and Wildlife Service 2015b, p. 52). Regardless, information does not indicate there has been any coyote predation on Sierra Nevada red fox, nor is there any information to indicate that coyotes are increasing at any of the sighting areas. However, as climate change progresses, climatologists predict that snowpacks are expected to diminish in the future (Kapnick and Hall 2010, pp. 3446, 3448; Halofsky et al. 2011, p. 21). Thus, higher elevations with deep snowpack that currently deter coyotes may become more favorable to them, potentially increasing the likelihood of coyote predation in the future.

Recently, two packs of gray wolves became established in the Southern Cascades between the Crater Lake and Lassen sighting areas (one pack each in Oregon and California). It is probable that restoration of wolves to the Southern Cascades in sustainable populations would lower coyote population numbers or exclude them from higher elevation forested areas, thereby facilitating the persistence of nearby Sierra Nevada red fox populations (Levi and Wilmers 2012, p. 926; Perrine et al. 2010); wolves are unlikely to compete heavily with Sierra Nevada red fox because they tend to take larger game (ODFW 2015, p. 8).

Based on the best available scientific and commercial data, the Fish and Wildlife Service found that predation may have had an overall low-level impact to the Sierra Nevada red fox due to the presence of coyotes co-occurring at multiple sighting areas within the subspecies' range; the potential for predation in the Crater Lake, Lassen, and Sonora Pass sighting areas into the future, given climate model projections of decreased snowpack levels that may make the habitat more favorable to coyotes; and the overall inability of the populations at those three locations to shift up in elevation (i.e., the Crater Lake, Lassen, and Sonora Pass populations appear at or near the highest elevations available for the subspecies). However, at this time, the best available data indicate that predation is not impacting the Sierra Nevada red fox at the subspecies-level to the degree that any more than individuals at a couple of the sighting areas may be affected both currently and into the future. Further, the best available data do not indicate that potential future changes in shifting habitat at high elevations (as suggested by climate models) would occur within the next 50 years to such a degree that coyote numbers would increase significantly throughout the subspecies' range to the point that coyote predation would rise to the level of a threat. Therefore, based on the analysis contained within

the Species Report and summarized above, the Service has determined that predation does not rise to the level of a threat currently nor is it likely to increase into the future.

Disturbance:

Sierra Nevada red fox tends to be nocturnal and, OSV use within the Lassen National Forest primarily occurs during daylight. Therefore, potential impacts to foraging behavior or movement would be low. As OSV trail use is an existing condition, Sierra Nevada red fox that occur in the areas affected by OSV use during winter may be habituated to OSV disturbance or may have already modified their behavior to avoid trail areas or OSV noise resonating in the forest may cause an alert or startle response in individual Sierra Nevada red foxes or may be accepted as ambient noise conditions of the environment.

Snow Compaction near Denning Sites (Potential for Injury or Mortality to Denning Individuals):

Although the March through May denning period overlaps with the OSV season, Sierra Nevada red fox use natural openings in rock piles at the base of cliffs and slopes and earthen dens as denning sites. If the Sierra Nevada red fox, uses earthen dens for denning sites, then OSV use would not be expected to have a potential direct effect on dens due to minimum snow depth requirements under each of the alternatives. If rock piles at the bases of cliffs and slopes are used, then the potential for injury or mortality to denning individuals would be expected to be low due to the rocky structure of the dens and because most OSV use occurs in flatter areas. Although there currently are no documented Sierra Nevada red fox dens on the Lassen National Forest, as they are located, a January 1 to June 30 limited operating period could be applied to avoid adverse impacts to potential breeding, if determined to be necessary.

Comparison of the Alternatives

Although we don't know where, specifically, impacts would occur at any given time and we cannot quantify the amount of impact, we know the potential for impacts would be greatest in areas of high OSV use. As described in the assumptions section, flatter areas with slopes less than 21 percent and canopy cover less than 70 percent, including the trails and staging areas, themselves, are used more by OSVs than others and, therefore, likely to receive the highest use. Those assumptions have been incorporated into the following analysis.

Using a habitat model developed by Cleve et al. (2011) that utilized occurrence data from the Lassen Peak region population combined with climatic and remotely sensed variables, 103,803 acres of Sierra Nevada red fox habitat occur within Lassen NFS lands (map BE-56). Based upon the information displayed in table 164, 83 percent of suitable Sierra Nevada red fox habitat is currently open to OSV use (alternative 1). However, only 32 percent is currently open to OSV use and of moderate to high OSV use. The potential for OSV-related injury or mortality, competition with coyotes, noise-based disturbance impacting individual foxes would be most likely to occur within that 32 percent of suitable habitat. High OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within less than 32 percent of Sierra Nevada red fox habitat. Under alternative 2, 30 percent of habitat is designated for and of moderate to high OSV use (map BE-57). Under alternatives 3 and 4, 28 percent of habitat is designated for and

of moderate to high OSV use (maps BE-58[27] and BE-59), and under alternative 5, 27 percent would be designated within areas of moderate to high use (map BE-60).

Table 164. Acres of suitable Sierra Nevada red fox habitat with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	85,956	82,319	75,332	80,663	69,911
Not Designated for OSV use	17,847	21,484	28,498	23,104	33,919
OSV use restricted to trails	NA	NA	2	NA	2
Total	103,803 acres				
Designated for OSV use and of moderate to high OSV use (percent of habitat total)	32,986 (31.8%)	31,199 (30.1%)	28,794 (27.7%)	30,990 (29.9%)	27,699 (26.7%)
Not Designated for OSV use and of moderate to high OSV use	7,602	9,389	11,864	9,598	12,889
Moderate to high OSV use and OSV use restricted to trails	NA	NA	1	NA	1
Total	40,588 acres				

Based on available observations from 1992 to present, areas of known use by Sierra Nevada red fox within the project area occur primarily south and east of Lassen Volcanic National Park. Under the existing condition and all action alternatives proposed, areas designated for OSV travel largely overlap with known red fox observations, dated 1992 to present, on the Lassen National Forest with proportion of overlap ranging from 98 percent under alternative 1 to 81 percent under alternative 5 (table 165). In a review of Sierra Nevada red fox observations available in the Lassen National Forest NRIS database reported from 1992 (when existing OSV use designations on the Lassen National Forest were implemented) to the present, during the estimated highest OSV use period (December 26 – March 31), 23 of 47 observations (49 percent) occur within 0.5 mile of groomed or ungroomed trails designated for OSV use under the existing condition. This indicates that, while Sierra Nevada red fox may be affected by OSV use at some level, they do not demonstrate complete avoidance of OSV moderate to high use areas in the project area, or avoidance of designated OSV areas in general.

Table 165. Overlap of OSV designated areas with known Sierra Nevada red fox occurrences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Sierra Nevada red fox observations (number)	46	46	39	44	38
Observation Percentage of Total (n=47)	98%	98%	83%	94%	81%

Based upon Sierra Nevada red fox monitoring conducted on the Lassen National Forest in 2012, interaction between Sierra Nevada red fox and OSV enthusiasts was considered to be unlikely due to inverse differences in peak activity hours, with peak activity for the fox occurring from

[27] Sierra Nevada red fox occurrence information shown on maps is based upon all available observational data, regardless of time of year.

approximately 2 hours after sunset until 2 hours prior to sunrise (Perrine 2005), while almost all OSV usage on the Lassen occurs during daylight hours. Therefore, the potential for injury, mortality, noise-based disruption of feeding or breeding is expected to be very low. However, as Sierra Nevada red fox den sites are located within the portion of the action area designated for OSV, den sites with potential to be impacted would be monitored to determine whether or not disturbance is occurring and if changes in management, including a January 1 to June 30 limited operating period around den sites, are necessary, thereby minimizing impacts to Sierra Nevada red fox. Snow compaction near denning sites would be limited to a much smaller area and unlikely due to the specific denning requirements of the species, as previously described.

Under all of the action alternatives (i.e., alternatives 2, 3, 4, and 5) trail densities would decline from 1.5 mi/m^2 to 0.2 mi/m^2. And because the majority of OSV use occurs on or within 0.5 mile of groomed trails and staging areas, or within meadows within 0.5 mile of designated trails, the potential for impacts to subnivean prey species, would be expected to decline with reduced trail densities under alternatives 2, 3, 4, and 5.

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to Sierra Nevada red fox, when combined with alternatives 1, 2, 3, 4, or 5, include vegetation management projects, fire salvage projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. Vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires, which can benefit species such as Sierra Nevada red fox for which wildfire is a threat.

Sierra Nevada red fox habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. However, wheeled motorized vehicles may not be used off of authorized NFS roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014), there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1 and December 31) and OSV trail grooming season (beginning December 26), and disturbance or displacement from this activity would occur outside of the Sierra Nevada red fox breeding season under alternatives 1, 2, 3, and 5. Under alternative 4, in which trail grooming would begin at the discretion of the groomer, there is the potential for a somewhat larger degree of overlap during years in which heavy snowfall begins early. Use of roads within Sierra Nevada red fox habitats after the March 31 termination date of the forest order closing roads for exclusive OSV use could contribute additional disturbance during the early part of the denning season. In general, most non-motorized winter recreation occurs along designated trails, where individuals would either avoid the area, if too great a disturbance, or habituate to the noise. Similar activities on State and private lands within the forest boundary may impact habitat availability outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown; State and privately held lands make up about 20 percent of the area within the forest boundary.

In summary, ongoing and reasonably foreseeable actions are not expected to contribute significant impacts to effects discussed for Southern Cascades DPS of Sierra Nevada red fox for the project under any of the alternatives. Although impacts may be additive locally, particularly to foraging

individuals, they would be much less likely to individuals utilizing reproductive dens in rocky areas at the base of cliffs and slopes.

Determination Statement

Alternatives 1, 2, 3, 4, and 5 of the Lassen National Forest Over-snow Vehicle Use Designation Project may affect individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for Southern Cascades DPS of Sierra Nevada red fox in the project area based on the following rationale:

The vegetative structure or composition of suitable Sierra Nevada red fox habitat would not be physically modified by OSV use and related activities.

- Although the potential for impacts to individuals within suitable habitat ranges from 27 to 32 percent under all of the alternatives, the percentage of suitable Sierra Nevada red fox habitat impacted would actually be lower considering that the concentration of OSV use is not equal across the landscape, and based upon Sierra Nevada red fox monitoring conducted on the Lassen National Forest in 2012, interaction between Sierra Nevada red fox and OSV enthusiasts was considered to be unlikely due to inverse differences in peak activity hours. Therefore, the potential for injury, mortality, noise-based disruption of feeding or breeding is expected to be very low under all of the alternatives.
- The best available data indicate that predation is not impacting the Sierra Nevada red fox at the subspecies-level to the degree that any more than individuals at a couple of the sighting areas may be affected both currently and into the future. Further, the best available data do not indicate that potential future changes in shifting habitat at high elevations (as suggested by climate models) would occur within the next 50 years to such a degree that coyote numbers would increase significantly throughout the subspecies' range to the point that coyote predation would rise to the level of a threat to the Sierra Nevada red fox.
- OSV use would not be expected to have a potential direct effect on dens due to minimum snow depth requirements under each of the alternatives, the rocky structure of the dens and because most OSV use occurs in flatter areas. However, as Sierra Nevada red fox den sites are located within the portion of the action area designated for OSV, den sites with potential to be impacted would be monitored to determine whether disturbance is occurring and if changes in management, including a January 1 to June 30 limited operating period around den sites, are necessary, thereby minimizing impacts to Sierra Nevada red fox.
- Reduced trail densities, under alternatives 2, 3, 4, and 5 are likely to reduce the potential for impacts to subnivean prey species.

Bats

Fringed Myotis (*Myotis thysanodes*)

Regional Foresters Sensitive Species

Species Account

Most *Myotis thysanodes* in California are referable to *M. t. thysanodes*; populations in the northwestern part of the state (Humboldt, Siskiyou and Shasta Counties) have recently been placed in the subspecies, *M. t. vespertinus*, although relatively few specimens have been examined and the boundary between subspecies has not been clearly delineated.

Four subspecies are recognized (Manning and Jones 1988): *M. t. aztecus*, *M. t. thysanodes*, *M. t. pahasapensis*, and *M. t. vespertinus*. *M. t. pahasapensis* in western South Dakota, western Nebraska and eastern Wyoming; *M. t. aztecus* in southern Mexico (Hall 1981); and *M. t. vespertinus* in southwestern Washington, western Oregon, and northwestern California (Manning and Jones 1988). *M. t. thysanodes*, the primary subspecies found in California, ranges from 51′ 54° N. lat. in southern British Columbia (Rasheed et al. 1995) to Michoacán in southern Mexico (Hall 1981).

The limited data available suggest serious population declines. Maternity colonies identified between 1891 (Old Fort Tejon) and the early 1970s (Point Reyes National Seashore, Marin County) were likely considerably larger than any colonies known today. Forty-two animals were collected at the Fort Tejon site (five different collections between 1891 and 1945), 58 at Point Reyes National Seashore between 1973 and 1974, 40 in one year from a site in Napa County, 20 from a Tuolumne County site, and 14 from a Kern County site. Although, in the context of surveys not targeting this species, we have identified six new maternity sites in northern California, none of these contains more than 10 to 30 females. Dalquest (1947) described one site in Napa County as having about 50 animals in July 1945; 40 animals were collected at that time. In June 1987, the site contained 10 to 15 animals, and in August 1988, there were none. The grounds around this building had been considerably modified in 1988, for a new winery installation, and the building that housed the bats was experiencing more human activity and was scheduled for renovation. This species appears to be extremely sensitive to disturbance at roost sites and to human handling. While some species of *Myotis*, like *Myotis yumanensis*, seem tolerant of human incursions into their roosting space, *M. thysanodes* is not. A cave in Sequoia National Park was documented in 1951 as being a *M. thysanodes* maternity site; 16 animals were collected at that time. Additionally, this cave has experienced very heavy recreational use for many years. Vandalism has thwarted repeated attempts by the National Park Service to gate the cave. Although *M. thysanodes* has been mist-netted near this cave, it has not apparently been observed roosting there recently.

A comparison of historic and current records indicates limited re-colonization at sites from which *M. thysanodes* has been extirpated. What may have been the largest documented colony in California occupied a barn at Point Reyes National Seashore. Fifty-eight animals were collected from this site in 1973 and 1974. Monitoring of this site since 1979 showed annual reoccupation by a *Myotis yumanensis* maternity colony, but *M. thysanodes* was not detected until 1996. The Park Service has protected this site for at least 10 years, with no known human incursions into the roosting space.

M. thysanodes is widely distributed across southern British Columbia, Washington, Oregon, Idaho, Montana, Wyoming, Colorado, Utah, Nevada, California (including Santa Cruz Island), Arizona, New Mexico, western Texas, western South Dakota, western Nebraska, and south to Chiapas, Mexico.

In California, the species is found the length of the state, from the coast (including Santa Cruz Island) to over 1,800 meters (5,900 feet) in the Sierra Nevada. Records exist for the high desert and east of the Sierra Nevada. However, the majority of known localities are on the west side of the Sierra Nevada. Museum records suggest that while *M. thysanodes* is widely distributed in California, it is rare everywhere. Available museum records offer documentation for only six maternity sites: two in Kern County (including the type locality at Old Fort Tejon), and one each in Marin, Napa, Tuolumne, and Tulare counties. Investigation of four of these sites since 1990 has shown that while the roosts are still available, this species is no longer present at any of these sites.

Habitat Status

M. thysanodes occurs in xeric woodland (oak and pinyon-juniper most common) (Cockrum and Ordway 1959, Hoffmeister and Goodpaster 1954, Jones 1965, O'Farrell and Studier 1980, Roest 1951), hot desert-scrub, grassland, sage-grassland steppe, spruce-fir, mesic old growth forest, coniferous and mixed deciduous/coniferous forests (including multi-aged sub-alpine, Douglas-fir, redwood, and giant sequoia) (O'Farrell and Studier 1980, Pierson and Heady 1996, Weller and Zabel 2001). In a study in the Mogollon Mountains of New Mexico and Arizona, Jones (1965) found *M. thysanodes* occurred almost exclusively in evergreen forest (above 2,000 meters [6,600 feet] elevation), and was the fourth most common species in this habitat. Barbour and Davis (1969) found it to be one of the more common species in oak forest at 1,500 to 1,800 meters (4,900 to 5,900 feet) elevation in the Chiricahua Mountains. In a long-term study in western New Mexico (Jones and Suttkus 1972), *M. thysanodes* was found predominantly at the highest elevation sampled (2,600 meters [8,500 feet]), and was the ninth most common bat species in this habitat.

In mist-netting surveys, *M. thysanodes* is often found on secondary streams. Although nowhere common, the species occurs in netting records from sea level to at least 2,000 meters (6,500 feet) in the Sierra Nevada, California. It occurs primarily from sea level to approximately 1,200 to 2,100 meters (3,900 to 6,900 feet) (O'Farrell and Studier 1980) with an isolated record from 2,900 meters (9,500 feet) in New Mexico (Barbour and Davis 1969).

A paucity of records makes it difficult to assess habitat preferences for this species in California. Orr (1956) in reviewing specimens held at the California Academy of Sciences, notes two localities from the coastal region (Carmel in Monterey County and Woodside in San Mateo County). More recently, records have accumulated from the upper Sacramento River (Rainey and Pierson 1996). Although nowhere common, the species occurs as one of the rarer taxa in netting records from the central coast to at least 1,950 meters (6,400 feet) in the Sierra Nevada.

Roosting Habitat

Studies conducted in California, Oregon, and Arizona, have documented that *M. thysanodes* roosts in tree hollows, particularly in large conifer snags (Cross and Clayton 1995, Chung-MacCoubrey 1996, Rabe et al. 1998, Weller and Zabel 2001). Roost tree roosts were located in the tallest or second tallest snags in the stand, surrounded by reduced canopy closure, and under bark (ibid.). Tree roosting behavior is consistent with an observed association between *M. thysanodes* and heavily forested environments in the northern part of its range (Cross et al. 1976).

M. thysanodes is also known to use a variety of roost sites, including rock crevices (Cryan 1997), caves (Baker 1962, Burt 1934, Commissaris 1961, Easterla 1966, Easterla and Baccus 1973), mines (Cahalane 1939, Cockrum and Musgrove 1964), buildings (Barbour and Davis 1969, Musser and Durrani 1960, O'Farrell and Studier 1980), and bridges. It is also one of the species thought to be most reliant on abandoned mines (Altenbach and Pierson 1995).

M. thysanodes is a colonial roosting species. Colonies can be up to 2,000 individuals (Barbour and Davis 1969). Within buildings, this species tends to roost in the open in tightly packed clusters, mostly using the sides of ceiling joists (O'Farrell and Studier 1980). Any of these types of structures are used as both day and night roosts (Barbour and Davis 1969).

Work by Studier and O'Farrell (1972) on a colony in New Mexico suggested that *M. thysanodes* could fly at lower ambient temperature than many species, and sought cooler roosting conditions than did *M. lucifugus* with which it shared an attic roost. The two mine roosts identified recently in California were both relatively cool and damp (one mine had standing water). Barbour and Davis

(1969) noted that this species was readily captured at the entrances to night roosts in buildings, mines, and caves. In a 5-year study on the upper Sacramento River, *M. thysanodes*, though one of the least commonly encountered bats, was more readily detected at bridge night roosts than in netting surveys conducted over water (Rainey and Pierson 1996).

This species shows high roost site fidelity (O'Farrell and Studier 1980). Weller and Zabel (2001) noted frequent roost switching in tree roosts, but high fidelity to a given area. Roost switching has also been reported for caves (Baker 1962). *M. thysanodes* is highly sensitive to roost site disturbance (O'Farrell and Studier 1980).

Foraging Habitat

M. thysanodes often forages along secondary streams, in fairly cluttered habitat. It also has been captured over meadows (Pierson et al. 2001). Limited information is available on diet. The feces of one individual captured on the upper Sacramento River in California contained predominantly Coleopterans (beetles) and Hemipterans (bugs) (Rainey and Pierson 1996). Relatively heavy tooth wear on animals examined in a 5-year study on the Sacramento River suggests that in that area the species feeds primarily on heavy-bodied insects, such as Coleopterans and Hemipterans. The presence of non-flying taxa in the diet of the Oregon animals suggests a foraging style that relies at least partially on gleaning. *M. thysanodes* is known to fly during colder temperatures (Hirshfeld and O'Farrell 1976).

Reproduction

Maternity roosts have been found in sites that are generally cooler and wetter than is typical for most other Vespertilionids. Recent radio-tracking studies in the forested regions of northern California have shown that this species forms nursery colonies in predominantly early to mid- decay stage, large-diameter snags 58 to 167 centimeters dbh (23 to 66 inches dbh) (Weller and Zabel 2001).

Clough Cave in Sequoia National Park is the only cave found in California housing a maternal colony, for which there are multiple records. Outside of California, maternity colonies have been found in caves (e.g., Baker 1962, Easterla 1966). Mines are also used as roost sites (Cahalane 1939, Cockrum and Musgrove 1964, Barbour and Davis 1969). Since 1987, two small maternity roosts in mines were located (approximately 10 adult females each) in the coast range north of San Francisco.

Mating occurs in the fall following break-up of the maternity colony. Ovulation, fertilization, and implantation occur from April to May and are followed by a gestation of 50 to 60 days. One young is born from May to July, capable of flight in 16 days, and volant within 20 days.

Migration and Hibernation

Winter behavior is even more poorly understood than summer behavior. *M. thysanodes* is thought to migrate short distances to lower elevations or more southern areas (O'Farrell and Studier 1980). Scattered winter records suggest, however, that the species does not complete long-distance migrations, and like many species in the more temperate parts of California, may be intermittently active throughout the winter (O'Farrell and Studier 1980). The species has been found hibernating in buildings and mine tunnels along the coast in the San Francisco Bay area and in the coast range north of San Francisco.

Threats

Anthropogenic Roosts

Although *M. thysanodes* does not occur in urban areas, it has often been found in buildings in rural and semi-rural settings (e.g., wineries, Hearst Castle, Big Bear attic, Bale Grist Mill State Historic Park). These colonies are typically at high risk for negative human interactions.

A significant number of the few known maternity roosts in California are in historic buildings. Restoration of historic buildings may pose a threat to this species. One historic roost site (Old Fort Tejon) and two current roost sites are located in historic buildings owned by the California Department of Parks and Recreation. Another is located in a utility building on a State wildlife refuge. No known protective measures are in place. The tendency for bats to occupy historic buildings creates potential conflicts between the goals of historic preservation, access for public education, and wildlife protection. Although these conflicts are generally resolvable, and bat populations can almost always be accommodated in buildings without damaging historic values, this is frequently not appreciated.

Urban expansion often leads to removal of older buildings that provide potential roosts. Newer buildings generally do not provide suitable roosting habitat.

Intervention by pest control operators and public health departments can result in the elimination of many roost sites.

Forest Management

M. thysanodes appears to be highly dependent on tree roosts within forest and woodland habitats and potentially requires denser vegetation for foraging. In some forested settings, *M. thysanodes* appears to rely heavily on tree cavities and crevices as roost sites (Weller and Zabel 2001), and may be threatened by certain timber harvest practices. For example, in Arizona Chung-MacCoubrey (1996) found that this species prefers large-diameter (45 to 65 centimeters [18 to 26 inches] dbh) conifer snags.

Removal of snags and hardwoods during timber harvesting and the loss of hardwoods through conifer and brush competition (from a lack of fire management) have caused reductions in both roosting structures and foraging habitat. These practices are likely to be more severe on private lands. An increased demand for firewood can also lead to a decrease in available snags as roosts.

Increasing tree densities in forest settings could limit foraging and flight access.

Transportation

Bridge retrofitting often renders bridges unsuitable (day and night roosts) and/or disturbs colonies that are present during construction. There would likely be a loss of riparian habitat for foraging where bridges are constructed. River drainages, because they frequently offer the easiest routes through mountain ranges, are favored corridors for highway construction. Such construction commonly entails blasting of cliff faces, either for initial highway construction or later improvements (i.e., widening and straightening). Cliff roosting species are at risk of both direct impacts from blasting, and long-term loss of roosting habitat from cliff modifications. In some settings, it is possible that soil removal and blasting may expose rock and create habitat, but this is not generally the case because fractured, potentially unstable rock is often removed.

Direct and indirect Effects

OSV use on the Lassen National Forest would not change the habitat for fringed myotis bat as no habitat modifications are anticipated

Very little is known about the wintering behavior of fringed myotis bats. Some limited migration to lower elevation may occur. However, it fringed myotis remain on the landscape in winter, there is a low likelihood that behavior of individuals could be modified by the noise or disruption associated with OSV use or grooming of OSV trails. This would be entirely dependent on the location of the winter roost in proximity to a bridge, building, cavity, mine, or tree. Since there are no known winter roosts on the Lassen, noise cannot be mitigated should there be a noise impact from OSV activities. Should OSV activities create a temporary disturbance, breeding could be impacted, however, it would not preclude breeding at a later time. There should be no impact to the maternal roosts, as they would start in April or May, following snowmelt.

Fringed myotis bats drink water from streams or lakes when they emerge from roosts. In addition, they forage in riparian areas and meadows. Emissions from OSVs, particularly two-stroke engines on snowmobiles, release pollutants like ammonium, sulfate, benzene, PAHs, and other toxic compounds that are stored in the snowpack; during spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding waterbodies (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the project hydrology report (project record) for additional information). However, the minimum cross-country snow depth of 12 inches for alternatives 2, 3, and 5 is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage.

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to *M. thysanodes*, when combined with alternatives 1, 2, 3 4, or 5 include vegetation management and fire salvage projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. Seasonal limited operating periods required for raptor and other sensitive species for vegetation projects to prevent disturbance to known nesting or denning sites could also reduce disturbance to breeding bats. Vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires. Management prescriptions have emphasized retention of large snags and logs and retention of large conifers.

M. thysanodes habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. However, wheeled motorized vehicles may not be used off of authorized National Forest System roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014), there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1 and December 31) and OSV trail grooming season (beginning December 26), minimizing the potential for disturbance or displacement of roosting bats. Use of roads within fringed myotis bat habitats after the March 31 termination date of the forest order closing roads for exclusive OSV use can contribute additional disturbance during the early part of the *M. thysanodes* breeding season. There is a small potential for an additive effect from vehicle fluids from wheeled vehicles used to access firewood and Christmas trees, as well as from the use of

wheeled vehicles during the overlap season between OSVs and wheeled vehicles, to enter waterways, modifying pallid bat prey/food base. However, the risk for this impact is low because vehicle use does not occur in waterways and fluids would not normally reach waterways.

In general, most non-motorized winter recreation occurs along designated trails, and individual bats would either avoid roosting in those areas, if too great a disturbance, or habituate to the noise. Similar activities on State and private lands that make up about 20 percent of the area within the Forest boundary may impact habitat availability outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown. In summary, ongoing and reasonably foreseeable actions may be additive locally to individual bats, but are not expected to contribute substantial impacts to those discussed for the project under any of the alternatives.

Determination Statement

All alternatives of the Lassen National Forest Over-snow Vehicle Use Designation Project may impact individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for fringed myotis in the Forest Plan area based on the following:

- Proposed actions would not physically modify fringed myotis bat habitat.
- Proposed actions would generally occur when the species is hibernating and is generally inactive. However, individuals that emerge to forage during warmer weather could experience missed feeding when snow grooming activities occur during the early evening.
- Depending upon the location of winter roost structures with respect to OSV use, individual bats within winter roosts could be disturbed by noise associated with OSVs and human presence, and missed breeding attempts could result.
- The low risk of modification of the prey/food base or impact on drinking water quality from oil, gas, or other vehicle fluids entering waterways would be mitigated by the 12-inch minimum snow depth that would protect aquatic and riparian habitats from measurable impacts to vegetation or water quality.

Pallid Bat (*Antrozous pallidus*)

Regional Foresters Sensitive Species

Species Account

Antrozous pallidus was originally described in 1856 as *Vespertilio pallidus*, but has had the genus name of *Antrozous* since 1862, and has most commonly been recognized as *Antrozous pallidus* (Barbour and Davis 1969, Hermanson and O'Shea 1983). There are currently two subspecies recognized in California (*A. p. pacificus* and *A. p. pallidus*) (Hall 1981, Simmons 2005).

A. pallidus is distributed throughout much of the West, from southern British Columbia to central Mexico, and as far east as western portions of Kansas, Oklahoma, and Texas, with an isolated subspecies in Cuba (Hermanson and O'Shea 1983; Simmons 2005).

In California, *A. pallidus* is found from sea level up to approximately 2,250 meters (7,400 feet) (Baker et al. 2008, Pierson et al. 2001), although it is most commonly found below 1,800 meters (5,900 feet) (Barbour and Davis 1969, Orr 1954, Pierson et al. 2001), and there is a record from – 178 feet in Death Valley (Orr 1954). It is found along the coast, in the Coast Ranges, the Central Valley, up to mid-elevation in the Sierra Nevada and Cascade ranges, and in the more xeric and

desert habitats east of the Sierra Nevada and in southern California. Pallid bat has been documented on the Lassen National Forest.

Habitat Status

A. pallidus occurs in a number of habitats ranging from rocky arid deserts to grasslands into mid-elevation mixed deciduous/coniferous forests. In California, they are most commonly found in low-elevation desert washes, western sycamore (*Plantanus racemosa*) open riparian habitat, coast live oak (*Quercus agrifolia*) and valley oak (*Q. lobata*) savannah, mid-elevation black oak (*Quercus kelloggii*) and mixed deciduous/coniferous forest (black oak, incense cedar (*Libocedrus decurrens*) and ponderosa pine (*Pinus ponderosa*) habitat (Barbour and Davis 1969, Johnston et al. 2006, Orr 1954, Pierson et al. 2001, Pierson et al. 2002, Rainey and Pierson 1996). It is also associated with both coast redwood and giant sequoia forests (Pierson and Heady 1996, Orr 1954, Rainey et al. 1992).

Roosting Habitat

Pallid bats are quite eclectic in their roosting habits (Barbour and Davis 1969, Hermanson and O'Shea 1983, Lewis 1994 and 1996, Orr 1954). They roost in rock crevices (Orr 1954, Hermanson and O'Shea 1983, Pierson et al. 2002), under rock slabs (Vaughan and O'Shea 1976, Lewis 1996), in tree hollows (Orr 1954, Rainey and Pierson 1996, Rabe et al. 1998, Pierson et al. 2004), caves, abandoned mines, and a variety of other anthropogenic structures, including buildings (vacant and occupied), porches and garages (van Zyll de Jong 1985), and bridges (Barbour and Davis 1969, Beck and Rudd 1960, Johnston et al. 2004, Lewis 1996, Orr 1954, Pierson et al. 2001, Pierson et al. 2002, Vaughan and O'Shea 1976). Tree roosting appears to be preferred in the forested regions of northern California, and has been documented in large conifer snags (e.g., incense cedar, ponderosa pine, sugar pine) (Baker et al. 2008, Johnston and Gworek 2006), inside basal hollows of redwoods (Orr 1954, Rainey et al. 1992) and giant sequoias (Pierson and Heady 1996), and bole cavities in oaks and other trees (e.g., cottonwood, cypress) (Hall 1946, Orr 1954, Pierson et al. 2004, Rainey and Pierson 1996).

A radio-tracking study in the central coastal region of California documented winter roosting in the attic of an unheated building, with satellite roosts in trees (*Quercus lobata*, *Q. agrifolia*, *Umbellularia californica*, and *Platanus racemosa*) on or in the ground (under a large rock, under a dry mop in a shed, and under a concrete outhouse foundation) (Johnston et al. 2006). They have also been reported roosting in stacks of burlap sacks (Beck and Rudd 1960) and stone piles, particularly in the winter.

Pallid bats typically roost in maternity groups of 20 to 200 during summer (Hermanson and O'Shea 1983, Vaughan and O'Shea 1976), but this species will also roost singly during pregnancy (Lewis 1996). In fall, maternity colonies disperse into smaller groups, which may be found in many sites where they do not occur in summer (Orr 1954, Barbour and Davis 1969).

In Oregon, Pallid bats showed a higher fidelity toward night roosts than day roosts (Lewis 1994). Night roosts are most typically located within 1 to 2 kilometers of the day roost (Lewis 1994, Johnston et al. 2006, Johnston and Gworek 2006, Baker et al. 2008). Roost switching by females is variable; in Arizona, *A. pallidus* were reported to switch roosts in spring and autumn, but not during late pregnancy and lactation (O'Shea and Vaughan 1977), while in Oregon, females switch roosts throughout the summer, perhaps in an effort to benefit from lower ectoparasite loads (Lewis 1994). When using anthropogenic roosts in northern California, reproductive female *A. pallidus* generally occupy maternity roosts in April or May, and move to winter roosts in September, October, or even later if weather is moderate.

Compared to some other California bat species, *A. pallidus* are relatively intolerant of disturbance (O'Shea and Vaughan 1977, Lewis 1996, Johnston et al. 2004) and may abandon a roost when disturbed. Lewis (1996) noted that distances between day and nighttime roosts were usually less than 200 meters (656 feet), but ranged from 40 to 1,850 meters (0.025 to 1.1 miles).

This is one of the species most likely to be found night-roosting under bridges (Barbour and Davis 1969, Johnston et al. 2004, Pierson et al. 2001), but it can also be found in shallow caves, cliff overhangs, and other human-made structures (Hermanson and O'Shea 1983, Lewis 1994). Lewis (1994) also noted that bridges used by pallid bats as night roosts were wooden, or concrete girder. Pallid bats show a higher fidelity toward night roosts than day roosts (Lewis 1994). Night roosts are typically located within 1 to 2 kilometers (0.6 to 1.25 miles) of the day roost.

Foraging Habitat

Pallid bats forage close to the ground and vegetation in desert washes, open grassland, oak savannah, and/or forest with limited understory (e.g., ponderosa pine parkland or granite slabs with sparse vegetation) (Hermanson and O'Shea 1983). Johnston et al. (2006) found that male and female *A.pallidus pacificus* foraged intermittently through the winter months along and in riparian corridors with western sycamore (*Plantanus racemosa*), California bay (*Umbellularia californica*), and coast live oak (*Quercus agrifolia*) within canyon bottoms in central California; and during summer months, females and males foraged along ridges with grasslands, high open meadows and oak savannah habitats. Johnston and Gworek (2006), and Baker et al. (2008) determined that pallid bats frequently foraged on logging roads and in open and semi-open short grass meadows in the northern Sierra Nevada. Foraging appears to be concentrated in two periods – one just after emergence and one before returning to the roost (Hermanson and O'Shea 1983).

Lewis (1996) recorded distances of between 1 and 4 kilometers (0.6 to 2.5 miles) traveled between roost sites and foraging areas and Johnston et al. (2006) found similar distances (0.2 to 4.0 kilometers) for males and females during winter months. Johnston and Gworek (2006), found that radio-tagged bats in the northern Sierra Nevada foraged a mean distance of 1.1 miles from day roosts during summer months in the northern Sierra Nevada. Baker et al. (2008) noted that the size of foraging areas for this species varied among sex and reproductive classes, with lactating females exhibiting the smallest foraging areas (1.56 square kilometers ± 0.88 SE) and post-lactating females the largest foraging areas (5.97 square kiometers ± 2.69 SE).

A. pallidus feeds primarily on medium to large, ground-dwelling prey, such as flightless arthropods (such as scorpions, Jerusalem crickets, cicadas, wolf spiders, and centipedes), (Hatt 1923, Ross 1961, Hermanson and O'Shea 1983) and typically between 20 and 70 millimeters (0.8 to 2.7 inches) in length (Bell 1982). Large cerambycid beetles, particularly *Prionus californicus*, and ten-lined June beetles (*Polyphylla decemlineata*) are also major prey items (Barbour and Davis 1969, Johnston and Fenton 2001, Orr 1954, Pierson et al. 2004) during the early part of summer. Johnston and Fenton (2001) found that a colony of *A. p. pacificus* had specialized individual dietary preferences within the same colony, whereas individuals in a colony of *A. p. pallidus* all ate generally the same prey items on any given night. *Antrozous* also gleans prey from vegetation (Hermanson and O'Shea 1983, and take prey in flight (Johnston and Fenton 2001). Bell (1982) stated that pallid bats used passive listening, and not echolocation, to detect and capture arthropods. However, *A. p. pallidus* foraged primarily on a 10-millimeter (0.4-inch) scarab beetle in flight during mid-summer in Death Valley when the prey species was abundant (Johnston and Fenton 2001).

Reproduction

Pallid bats are gregarious, and often roost in colonies of between 20 and several hundred individuals. Males and females congregate in a central winter roost often associated with smaller satellite roosts in late fall and winter months (Johnston et al. 2006) when breeding occurs (Hermanson and O'Shea 1983). During spring months, pregnant females leave the winter roost and gather in summer maternity colonies (Johnston et al. 2006), with parturition generally occurring between May and July, depending on local climate (Barbour and Davis 1969). Males often leave the winter roost and use a variety of solitary roosts, but they sometimes form a bachelor colony (Johnston et al. 2006). Females can give birth to a single pup, twins, or sometimes triplets, with twins being most common (Barbour and Davis 1969). Young are generally weaned in mid to late August. Maternity colonies generally form in early April (Barbour and Davis 1969) and disband between August and October (Hermanson and O'Shea 1983, Lewis 1994.

Migration/Hibernation

Pallid bats are relatively inactive during the winter; however, Johnston et al. (2006) found that males and females foraged intermittently throughout the winter months, in central California.

They are not known to migrate long distances (Barbour and Davis 1969), and Johnston et al. (2004) determined that the primary female/male winter roost of a large colony in central California was approximately 1.7 kilometers (1 mile) from the primary maternity colony roost. During January and February, pallid bats foraged about once every six nights, at temperatures down to 4 degrees C (39 degrees F) and on rainy nights, and winter prey at a central California coast site included darkling ground beetles (Carabidae), moths (Lepidotera) and other prey types often taken during warmer parts of the year (Johnston et al. 2006). Occasional winter activity has been reported in southern portions of its range and has been observed in Nevada flying during winter when temperatures were as low as 36 degrees F (O'Farrell et al. 1967, O'Farrell and Bradley 1970). Hibernating or mildly torpid bats were reported in buildings and a hollow post (Barbour and Davis 1969), limestone cliffs (Orr 1954), and caves and mines (Hall 1946).

Threats

Anthropogenic Roosts

Due to their propensity for using a wide range of buildings as well as bridges, their highly visible roosting habits, urine stains and odor, as well as visible insect prey remains at night roosts, these bats are highly susceptible to negative human contact. Because pallid bats frequently roost in buildings and bridges, display considerable roost loyalty in such roosts, and are often found roosting together with *T. brasiliensis* and *M. yumanensis*, two species that form large colonies (several hundreds to thousands), often where they are highly visible (e.g., open rafters) they are frequently subjected to vandalism, exclusion (humane or otherwise), and even illegal poisoning. This species is often associated with historic buildings in which their presence is typically viewed as a hazard by property managers. Exclusion, renovation, and demolition of buildings and urban expansion likely account for observed declines in Los Angeles, Orange, Santa Clara, and San Diego Counties. Particularly vulnerable are rural structures inhabited by pallid bat colonies that become subjected to renovation or demolition due to a change in land ownership or change in land-use practices. These changes are usually associated with the onset of urban development, but can occur many years and miles ahead of such development.

Forest Management

The removal of snags and damaged trees (particularly large ponderosa pines and incense cedars) and hardwoods during timber harvesting and the loss of hardwoods through conifer and brush competition (from a lack of fire management) have caused reductions for both roosting structures and foraging habitat. These practices may be severe on both private and public lands. Prescribed burning of leaf-litter likely results in a reduction or loss of foraging habitat.

Mines

Pallid bat colonies can be impacted by inappropriate mine closures or disturbance during human visitation. Most pallid bat colonies in mines in southern California appear to be in the desert.

Oak Woodlands

The loss of hardwoods due to firewood cutting, urban expansion, conversion to agriculture, rangeland management, and disease (e.g., sudden oak death syndrome) has caused serious reductions for both roosting and foraging habitat. Pallid bats are strongly associated with oaks throughout California. They can be found roosting in both dead and live oaks, and are frequently found foraging under or at the edge of the oak canopy (Rainey and Pierson 1996, Johnston and Fenton 2001, Johnston et al. 2006). Radio-tracking studies identified pallid bats roosting in black oaks in mixed deciduous forest (Rainey and Pierson 1996). At Vandenberg Air Force Base, they were radio-tracked foraging in coast live oak habitat (Pierson et al. 2002).

Oak roosts (Rainey and Pierson 1996). Pallid bats were also radio-tracked to roosts in blue oak in Carmel Valley. Sudden oak death predisposes woodlands to fire.

Transportation

Bridge retrofitting can render bridges unsuitable for both day and night roosting by this species, both during construction and after completion. Bridge replacement can result in complete loss of long-term day and night roost habitat, as many bridges being replaced are 40 to 60 years old. Bridges can support large populations of *A. pallidus*, increasing impacts to this species when bridge roosts are lost. Pallid bats may not return to bridge roosts disturbed by construction activities, even when roost sites are not modified (Johnston et al. 2004). Riparian habitat used for foraging where bridges occur is frequently partially cleared or temporarily disturbed to accommodate construction activities.

Direct and indirect Effects

OSV use and related activities on the Lassen National Forest would not change the habitat for pallid bat, as no habitat modifications are anticipated. Due to the behavior of pallid bats when they can be seen in winter on warmer nights (39 degrees F), or males moving between winter roosts, or an occasional feeding (once every six nights), there is a low likelihood that pallid bat behavior could be modified by OSV noise or disruption of grooming trails for OSV use.

OSV noise could cause disturbance at the winter roost. This would be entirely dependent on the location of the winter roost in proximity to a bridge, building, cavity, mine or tree. Since there are no known winter roosts on the Lassen, no reduction of noise can be mitigated should there be a noise impact from OSV activities. Should OSV activities have a temporary disturbance, breeding could be impacted; however, it would not preclude breeding at a later time. There should be no impact to the maternal roosts, as they would start in April or May, following snowmelt.

Species such as pallid bat forage on invertebrates in areas with riparian and/or aquatic environments. Emissions from OSVs, particularly two-stroke engines on snowmobiles, release pollutants like

ammonium, sulfate, benzene, PAHs and other toxic compounds that are stored in the snowpack; during spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding waterbodies (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the project hydrology report (project record) for additional information). However, the minimum cross-country snow depth of 12 inches under alternatives 2, 3, and 5 is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage.

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to pallid bats, when combined with alternatives 1, 2, 3, 4 or 5, include vegetation management and salvage projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. Seasonal limited operating periods required for raptor species for vegetation projects to prevent disturbance to known nest sites could also reduce disturbance to breeding bats. Vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires. Management prescriptions have emphasized retention of large snags, logs, and large conifers.

Pallid bat habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. However, wheeled motorized vehicles may not be used off of authorized NFS roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014), there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1and December 31) and OSV trail grooming season (beginning December 26), minimizing the potential for disturbance or displacement of roosting bats from this activity. Use of roads within pallid bat habitats after the March 31 termination date of the forest order closing roads for exclusive OSV use can contribute additional disturbance during the early part of the pallid bat breeding season. There is a small potential for an additive effect from vehicle fluids from wheeled vehicles used to access firewood and Christmas trees, as well as from the use of wheeled vehicles during the overlap season between OSVs and wheeled vehicles, to enter waterways, modifying pallid bat prey/food base. However, the risk for this impact is low because vehicle use does not occur in waterways and fluids would not normally reach waterways.

In general, most non-motorized winter recreation occurs along designated trails, and pallid bats would either avoid roosting in those areas, if too great a disturbance, or become habituate to the noise. Similar activities on state and private lands that make up about 20 percent of the area within the Forest boundary may impact habitat availability outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown. In summary, ongoing and reasonably foreseeable actions may be additive locally to individual pallid bats, but are not expected to contribute substantial impacts to those discussed for the project under any of the alternatives.

Determination Statement

All alternatives of the Lassen National Forest Over-snow Vehicle Use Designation Project may impact individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for pallid bat in the project area based on the following:

- Proposed actions would not physically modify pallid bat habitat.
- Proposed actions would generally occur when the species is hibernating and is generally inactive. However, individuals that emerge to forage during warmer weather could experience missed feeding when snow grooming activities occur during the early evening.
- Depending upon the location of winter roost structures with respect to OSV use, individual bats within winter roosts could be disturbed by noise associated with OSVs and human presence and missed breeding attempts could result.
- The low risk of modification of the prey/food base from oil, gas, or other vehicle fluids entering waterways would be mitigated by the 12-inch minimum snow depth that would protect aquatic and riparian habitats from measurable impacts to vegetation or water quality.

Townsend's Big-eared Bat (*Corynorhinus townsendii*)

Regional Foresters Sensitive Species

Species Account

For most of its taxonomic history, the recognized generic name for this North American species was *Corynorhinus*. Beginning, however, with a taxonomic revision by Handley (1959 in Piaggio and Perkins 2005), it became known as *Plecotus*. Two recent phylogenetic studies have reviewed relationships among plecotine genera (Frost and Timm 1992, Tumlison and Douglas 1992), and have recommended resurrecting the generic name of *Corynorhinus* to distinguish the North American from the Palearctic forms. This change has been recognized by Simmons (2005).

There are five currently recognized subspecies of *C. townsendii* in the United States (Handley 1959 in Piaggio and Perkins 2005); two (*C. t. townsendii* and *C. t. pallescens*) in the western U.S., two (*C. t. ingens* and *C. t. virginianus)* in the eastern part of the country, and one (*C. t. australis*) with a primarily Mexican distribution, which overlaps with *C. t. pallescens* in western Texas. Only the two western subspecies are found in California (Piaggio et al. 2009).

C. t. townsendii occurs in California, Oregon, Washington, Nevada, Idaho, and possibly southwestern Montana and northwestern Utah. *C. t. pallescens* occurs in all the same states as *C. t. townsendii*, plus Arizona, Colorado, New Mexico, Texas, and Wyoming (Handley 1959 in Piaggio and Perkins 2005). Throughout much of their range in California, Idaho, Nevada, Oregon and Washington, there are extensive zones of intergradation for the two subspecies. Throughout the zone of intergradation, it is frequently impossible to assign individuals to one subspecies or the other. Handley (1959 in Piaggio and Perkins 2005) distinguishes the two subspecies based on size and color characteristics, but he also notes that the full spectrum of characteristics for both subspecies can be found within a single population. For the purposes of this document, we make no distinction between these subspecies.

In California, *C. townsendii* is found throughout much of the state, except for the Central Valley and very high elevations. The largest populations are concentrated in areas offering caves (commonly limestone or basaltic lava) or mines as roosting habitat. The species is found from sea level along the coast to 1,820 meters (6,000 feet) in the Sierra Nevada (Dalquest 1947, Pearson et al. 1952, Pierson

and Rainey 1998). In the White Mountains, summer records for males extend up to 2,410 meters (7,900 feet), and hibernating groups have been found in mines as high as 3,188 meters (10,460 feet) (Szewczak et al. 1998). Maternity colonies are more frequently found below 2,000 meters (6,560 feet) (Pierson and Fellers 1998, Szewczak et al. 1998).

Outside California, *C. townsendii* has been found to 2,400 meters (7,900 feet) (Jones 1965) and 2,900 meters (9,500 feet) (Findley and Negus 1953).

There are historical and fairly recent (1997) records of Townsend's big-eared bat near the Lassen National Forest as well as a documented maternity and hibernaculum in lava tubes on the Hat Creek Ranger District.

Habitat Status

C. townsendii occurs from the inland deserts to the cool, moist coastal redwood forests; in oak woodlands of the inner Coast Ranges and Sierra Nevada foothills; and lower- to mid-elevation mixed coniferous-deciduous forests. Distribution is patchy, and strongly correlated with the availability of caves and cave-like roosting habitat, with population centers occurring in areas dominated by exposed, cavity-forming rock and/or historic mining districts (Genter 1986, Graham 1966, Humphrey and Kunz 1976, Kunz and Martin 1982, Pierson and Rainey 1998). Its habit of roosting on open surfaces makes it readily detectable, and it is often the species most frequently observed (commonly in low numbers) in caves and abandoned mines throughout its range.

Roosting Habitat

C. townsendii prefers open surfaces of caves or cave-like structures, such as mines (vertical and horizontal) (Barbour and Davis 1969, Graham 1966, Humphrey and Kunz 1976). It has also has been reported in such structures as buildings, bridges, and water diversion tunnels that offer a cavernous environment (Barbour and Davis 1969, Dalquest 1947, Howell 1920, Kunz and Martin 1982, Pearson et al. 1952, Perkins and Levesque 1987, Brown et al. 1994, Pierson and Rainey 1998). Roosting structures often contain multiple openings. It seems to prefer dome-like areas, possibly where heat or cold is trapped (warm pockets for maternal roosting, cold pockets for hibernation). It has also been reported in rock crevices and large hollow trees (Fellers and Pierson 2002). The discovery of a maternity roost in a hollow redwood tree (Mazurek 2004) suggests that coastal populations may have historically relied on these structures.

Specific roosts may be used only one time of year or may serve many different functions throughout the year (i.e., maternal, hibernation, dispersal, bachelor, breeding, etc.). Roosting surfaces often occur in twilight conditions; however, some have been located very deep inside caves or mines. There is evidence that maternity colonies may use multiple sites for different stages (pregnancy, birthing, or rearing) (Pierson et al. 1991, Sherwin et al. 2000). Males remain solitary during the maternity season.

This species appears to have fairly restrictive roost requirements (Humphrey and Kunz 1976, Pierson et al. 1991). Roost temperature appears to be critical (Lacki et al. 1994, Pearson et al. 1952, Pierson and Rainey 1998). Temperatures vary in maternity roosts throughout California from 19 degrees C (66 degrees F) in cooler regions to 30 degrees C (86 degrees F) in warmer southern regions (Pierson et al. 1991). Some colonies are known to change roosts during the maternity season, using cooler roosts earlier in the year (Pierson et al. 1991) and using warmer roosts after pups are born. Roost dimensions are also important. The majority of the roosts examined in California are fairly spacious, at least 30 meters (100 feet) in length, with the roosting area located at least 2 meters (6 feet) above the ground, and a roost opening at least 15 centimeters by 62 centimeters (6 inches by 24 inches)

(Pierson et al. 1991). Maternity clusters are always situated on open surfaces, often in roof pockets or along the walls just inside the roost entrance, within the twilight zone.

C. townsendii is very sensitive to human disturbance; however, in some instances it can habituate to reoccurring and predictable human activity.

Foraging Habitat

Foraging associations include edge habitats along streams and areas adjacent to and within a variety of wooded habitats (Brown et al. 1994, Fellers and Pierson 2002, Pierson et al. 2002). Recent radio-tracking and light-tagging studies have found *C. townsendii* foraging in a variety of habitats. Brown et al. (1994) showed that on Santa Cruz Island in California, they avoided the lush introduced vegetation near their day roost, and traveled up to 5 kilometers (3 miles) to feed in native oak and ironwood forest. Radio-tracking and light-tagging studies in northern California found *C. townsendii* foraging within forested habitat (Rainey and Pierson 1996). In Oklahoma, *C. t. ingens* preferred edge habitats (along intermittent streams) and open areas (pastures, agricultural fields, native grass) over wooded habitat (Clark et al. 1993). *C. townsendii* has been known to travel up to 24 kilometers (15 miles) from roost sites while foraging (Dobkin et al. 1995). They forage as long as weather permits in the fall, and are periodically active in winter (Pierson et al. 1991).

Although diet has not been examined in detail for any California populations, it is likely that *C. townsendii* here, as elsewhere, is a Lepidopteran specialist, feeding primarily (over 90 percent of the diet) on medium-sized (6 to 12 millimeter) (0.2 to 0.5 inch) moths (Dalton et al. 1986, Ross 1967, Sample and Whitmore 1993, Whitaker et al. 1977, 1981). Shoemaker and Lacki (1993) determined that *P. t. virginianus* differentially selected noctuid moths, with geometrids, notodontids, and sphingids also making up a significant portion of the diet. Representatives of the family Arctiidae constituted 37.5 percent of the available moth prey items, but were not consumed. Sample and Whitmore (1993) identified moth species from wing fragments collected at maternity caves. Of the 28 moth taxa identified, 15 were noctuids. Twenty-one species were forest-dwelling, and six were associated with open, field habitats. In addition to Lepidopterans, small quantities of other insects have been detected in the diet of *C. townsendii*, particularly Coleoptera and Diptera (Dalton et al. 1986, Ross 1967, Sample and Whitmore 1993). Hemiptera, Hymenoptera, Homoptera, Neuroptera, Trichoptera, and Plecoptera have also been found sporadically (Dalton et al. 1986, Whitaker et al. 1977).

Reproduction

C. townsendii is a colonial species with maternity aggregations forming between March and June (based on local climate and latitude). Colony size ranges from a few dozen to several hundred. Mating generally takes place in both migratory sites and hibernacula between September or October and February. Females are generally reproductive in their first year, whereas males do not reach sexual maturity until their second year. Gestation length varies with climatic conditions, but generally lasts from 56 to 100 days (Pearson et al. 1952). Some evidence shows that maternity colonies may have up to three different sites for given stages – one each for pregnancy, birthing, and rearing. A single pup is born between May and July (Easterla 1973, Pearson et al. 1952). *C. townsendii* pups average 2.4 grams (0.1 ounce) at birth, nearly 25 percent of the mother's postpartum mass (Kunz and Martin 1982). Young bats are capable of flight at 2.5 to 3 weeks of age and are fully weaned at 6 weeks (Pearson et al. 1952). Nursery colonies start to disperse in August about the time the young are weaned, and break up altogether in September and October (Pearson et al. 1952, Tipton 1983). Pearson et al. (1952) estimated annual survivorship at about 50 percent for young, and

about 80 percent for adults. Band recoveries have yielded longevity records of 16 years, 5 months (Paradiso and Greenhall 1967).

Migration/Hibernation

C. townsendii is a relatively sedentary species, for which no long-distance migrations have been reported (Barbour and Davis 1969, Humphrey and Kunz 1976, Pearson et al. 1952). The longest movement known for this species in California is 32.2 kilometers (20 miles) (Pearson et al. 1952). There is some evidence of local migration, perhaps along an altitudinal gradient.

Hibernation sites are generally caves or mines (Pearson et al. 1952, Barbour and Davis 1969), although animals are occasionally found in buildings (Dalquest 1947, E. Pierson pers. obs.,). Winter roosting is typically composed of mixed-sexed groups from a single individual to several hundred or several thousand, however, behavior varies with latitude. In areas with prolonged periods of non-freezing temperatures, *C. townsendii* tends to form relatively small hibernating aggregations of single to several dozen individuals (Barbour and Davis 1969, Pierson et al. 1991, Pierson and Rainey 1998). Larger aggregations (75 to 460) are confined to areas which experience prolonged periods of freezing temperatures (Pierson and Rainey 1998). Studies in the western United States have shown that *C. townsendii* selects winter roosts with stable, cold temperatures, and moderate air flow (Humphrey and Kunz 1976, Kunz and Martin 1982). Individuals roost on walls or ceilings, often near entrances (Humphrey and Kunz 1976). Temperature appears to be a limiting factor in roost selection. Recorded temperatures in *C. townsendii* hibernacula range from minus 2.0 to 13.0 degrees C (28 to 55 degrees F) (Humphrey and Kunz 1976, Genter 1986, Pearson et al. 1952, Pierson et al. 1991), with temperatures below 10 degrees C (50 degrees F) being preferred (Pierson and Rainey 1998). The period of hibernation is shorter at lower elevations and latitudes.

Threats

Surveys conducted by Pierson and Rainey (1996) show marked population declines for both subspecies in California. This species has been petitioned for listing as threatened or endangered status in the state. Over the past 40 years, there has been a 52 percent loss in the number of maternity colonies, a 45 percent decline in the number of available roosts, a 54 percent decline in the total number of animals, and a 33 percent decrease in the average size of remaining colonies for the species as a whole statewide. The status of particular populations is correlated with amount of disturbance to or loss of suitable roosting sites. The populations that have shown the most marked declines are along the coast, in the Mother Lode country of the western Sierra Nevada foothills, and along the Colorado River.

A comparison of former and current population estimates for 18 historically known maternity colonies shows that six colonies (33 percent) appear to be extirpated; six others (33 percent) have decreased in size; one (6 percent) has remained stable; and five (28 percent) (four of which are protected within national parks) have increased.

A comparison of colony size for historically and currently known colonies, indicates that mean colony size has decreased from 165 (n = 18) to 111 (n = 34). The median colony size has decreased from 100 to 75. There are currently 38 known maternity colonies, occupying 55 known roost sites, with an estimated total population of about 4,300 individuals. Only three of these colonies have adequately protected roost sites.

Hibernating *C. townsendii* have been found historically or during a recent survey (Pierson and Rainey 1998) at 44 sites (24 in mines, 19 in caves, one in a building). Most of these sites contain fewer than 20 individuals. Only three hibernating colonies number more than 100. The most

significant aggregations (all those with over 100) occur in the northernmost part of the state, particularly Siskiyou County. In other areas, particularly the desert, smaller aggregations (5 to 20) are more typical. Four additional hibernating sites, not visited by Pierson and Rainey (1994) were located in 1979 (Marcot 1984), one of which contained 40 to 50 individuals.

Inappropriate behavior on the part of well-intentioned researchers and others (i.e., entry into maternity roosts, capture of animals in roosts) could also contribute to population declines.

The combination of restrictive roost requirements and sedentary behavior suggests that *C. townsendii* is roost limited, and that roost loss, through disturbance or destruction, has been primarily responsible for population declines in most areas. Although fire, winter storms, or general deterioration are sometimes responsible, in all but 2 of 39 documented cases, roost loss in California can be directly linked to human activity (e.g., demolition, renewed mining, entrance closure, human-induced fire, renovation, or roost disturbance). Population declines are most highly correlated with roost destruction in the San Francisco Bay area, along the northern coast, and in San Diego County, and with roost disturbance in the Mother Lode country and along the Colorado River.

Anthropogenic Roosts

Although *C. townsendii* is often found using human-made structures, such as barns, large houses, historic buildings, and bridges, they are very sensitive to disturbance, and will readily abandon a day roost, particularly a maternity roost, if disturbed. Bats are often not tolerated in historic structures, even those that are not open to the public, due to concerns over damage to the historic fabric of a building, so even a rare species such as *C. townsendii*, one that forms relatively small colonies, is subject to permanent loss of critical roost habitat. Because *C. townsendii* is a large cavity-roosting species, and not a crevice-roosting species, they will not use bat houses as replacement habitat, so loss of structure roosts is highly significant for this species.

The tendency for *C. townsendii* to roost in visible clusters on open surfaces, near roost entrances, makes them highly vulnerable to negative human interactions. Inadequate management policies on public lands can lead to roost destruction. Of the 20 largest currently known colonies in California, 13 are on public lands. While the National Park Service and California Department of Parks and Recreation have made substantial commitments to protecting known roosts in some parks, they have failed to provide adequate protection in others. Other agencies have been less willing to recognize the biological significance of cave and mine roosts, often against the advice of their own biologists.

Caves

Maternity colonies are impacted by inappropriate cave closures or disturbance during human visitation.

The increasing and intense recreational use of caves in California provides the most likely explanation for why most otherwise suitable, historically significant roosts are currently unoccupied. It is well documented that *C. townsendii* is so sensitive to human disturbance that simple entry into a maternity roost can cause a colony to abandon or move to an alternate roost (Pearson et al. 1952; Graham 1966; Stebbings 1966; Mohr 1972; Humphrey and Kunz 1976; Stihler and Hall 1993).

While the National Park Service has made substantial commitments to protecting known roosts in some parks, other agencies have been less willing to recognize the biological significance of cave and mine roosts, often against the advice of their own biologists

Forest Management

This issue is restricted to commercially harvested areas of the state, particularly eastern and northern California. Large hollow redwood and sequoia offer cave-like structures for maternal roosting. Other conifer and hardwood snags offer male roosting sites. Harvested areas can also affect riparian edge habitats for foraging. Harvesting may alter microclimates around caves and mines, possibly rendering them uninhabitable.

Forest management activities, particularly timber harvest and spraying that kills non-target Lepidopteran species, may alter the prey base for *C. townsendii*. Perkins and Schommer (1991) suggest that *Bacillus thuringiensis* sprays may suppress Tussock moth and spruce budworm reproduction enough to suppress reproduction in resident *C. townsendii*.

Mines

Maternity colonies are impacted by renewed mining activities, inappropriate mine closures, and disturbance during human visitation.

Old mines are significant roosting habitat for a number of bat species, particularly *C. townsendii* (Altenbach and Pierson 1995). The intense recreational use of mines in California provides the most likely explanation for why most otherwise suitable, historically significant roosts are currently unoccupied. It is well documented that *C. townsendii* is so sensitive to human disturbance that simple entry into a maternity roost can cause a colony to abandon or move to an alternate roost (Pearson et al. 1952; Graham 1966; Stebbings 1966; Mohr 1972; Humphrey and Kunz 1976; Stihler and Hall 1993). Liability and safety concerns have led to extensive mine closure programs in western states, particularly on public lands, often without consideration for the biological values of old mines. If non-bat compatible closures (backfilling or blasting) are done without prior biological survey or if surveys are conducted at the wrong time of year (Altenbach 1995, Navo 1995, Rainey 1995), they can result in the entrapment, and thus, elimination of entire colonies. Even if the bats are excluded prior to hard closure, they may be unable to find suitable replacement habitat.

The resurgence of gold mining in the West could threaten cave-dwelling bat species (Brown and Berry 1991, Brown et al. 1995). Since open pits, created by current mining practices, are often located in historic mining districts, old mine workings are frequently demolished as part of the ore extraction process. While effective mitigation is possible (Pierson 1989, Pierson et al. 1991), there is currently no legal mandate requiring that existing populations be protected.

Additionally, process water containing cyanide has caused substantial wildlife mortality at a number of mine sites in the West. Although one study found that bats constitute 33.7 percent of documented wildlife fatalities (Clark and Hothem 1991), they frequently are not considered in assessment of cyanide risks (Nevada Mining Assoc. et al. 1990). Similarly, process residues in open oil sumps are another significant source of wildlife mortality (Flickinger and Bunck 1987, Esmoil and Anderson 1995).

Transportation

Bridge modifications could also impact *C. townsendii* colonies. The mandate for earthquake retrofitting on bridges could either disturb active roosts or render roost sites unsuitable. A number of older bridges are being removed and replaced with those that have bat-unfriendly designs. There is a potential loss of riparian habitat for foraging where bridges are constructed.

Rangeland Management

The presence of livestock can severely reduce ground and shrub cover (when not managed properly), which can lead to a reduction in prey species abundance. Many species of bats do benefit from properly designed water impoundments as a drinking source.

Although the effects of grazing have not been specifically addressed for this species, a radio-tracking study at Point Reyes National Seashore indicated that telemetered bats avoided grazed pastureland (E. Pierson pers. obs.).

Direct and Indirect Effects

OSV use on the Lassen National Forest would not change the habitat for Townsend's big-eared bat, as no habitat modifications are anticipated

Very little is known about Townsend's big-eared bats' wintering behavior. Some limited migration to lower elevation may occur. However, if Townsend's big-eared bats remain on the landscape in winter, there is a low likelihood that their behavior could be modified by the noise or disruption associated with OSV use or grooming of OSV trails. This would be entirely dependent on the location of the winter roost in proximity to a bridge, building, cavity, mine or tree. Since there are no known winter roosts on the Lassen, no reduction of noise can be mitigated should there be a noise impact from OSV. Should OSV activities have a temporary disturbance, breeding could be impacted; however, it would not preclude breeding at a later time. There should be no impact to the maternal roosts, as they would start in April or May, following snowmelt.

Townsend's big-eared bats forage in riparian areas and meadows outside of the hibernation period. Emissions from OSVs, particularly two-stroke engines on snowmobiles, release pollutants like ammonium, sulfate, benzene, PAHs and other toxic compounds that are stored in the snowpack; during spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding waterbodies (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the project hydrology report (project record) for additional information). However, the minimum cross-country snow depth of 12 inches under alternatives 2, 3, and 5 is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage.

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to Townsend's big-eared bats, when combined with alternatives 1, 2, 3, 4 or 5, include vegetation management projects, fire salvage projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. However, seasonal limited operating periods required for raptor species for vegetation projects to prevent disturbance to known nest sites could also reduce disturbance to breeding bats. Vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires

Townsend's big-eared bat habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. However, wheeled motorized vehicles may not be used off of authorized NFS

roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014), there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1and December 31) and OSV trail grooming season (beginning December 26), minimizing the potential for disturbance or displacement of roosting bats from this activity. Use of roads within Townsend's big-eared bat habitats after the March 31 termination date of the forest order closing roads for exclusive OSV use can contribute additional disturbance during the early part of the Townsend's big-eared bat breeding season. There is a small potential for an additive effect from vehicle fluids from wheeled vehicles used to access firewood and Christmas trees, as well as from the use of wheeled vehicles during the overlap season between OSVs and wheeled vehicles, to enter waterways, modifying Townsend's big-eared bat prey base. However, the risk for this impact is low because vehicle use does not occur in waterways, and fluids would not normally reach waterways.

In general, most non-motorized winter recreation occurs along designated trails, and individual bats would either avoid roosting in those areas, if too great a disturbance, or habituate to the noise. Similar activities on State and private lands that make up about 20 percent of the area within the forest boundary may impact habitat availability outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown. In summary, ongoing and reasonably foreseeable actions may be additive locally to individual bats, but are not expected to contribute substantial impacts to those discussed for the project under any of the alternatives.

Determination Statement

All alternatives of the Lassen National Forest Over-snow Vehicle Use Designation Project may impact individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for Townsend's big-eared bat in the project area based on the following:

- Proposed actions would not physically modify Townsend's big-eared bat habitat.
- Proposed actions would generally occur when the species is hibernating and is generally inactive.
- Depending upon the location of winter roost structures with respect to OSV use, individual bats within winter roosts could be disturbed by noise associated with OSVs and human presence and missed breeding attempts could result.
- The low risk of modification of the prey/food base from oil, gas, or other vehicle fluids entering waterways would be mitigated by the 12-inch minimum snow depth that would protect aquatic and riparian habitats from measurable impacts to vegetation or water quality.

Species that Utilize Riparian or Wetland Habitats

Bald Eagle (*Haliaeetus leucocephalus*)

Regional Foresters Sensitive Species

Species Account

The bald eagle, (*Haliaeetus leucocephalus*), was federally de-listed on August 8, 2007 (Federal Registrar Vol. 72, No. 130, pp. 37346-37372) and then placed on the USDA Forest Service Region 5 Regional Forester's sensitive species list.

Bald eagles occur throughout most of North America and have undergone large population fluctuations during the past two centuries (Murphy and Knopp 2000, USDA Forest Service 2001).

This species occurs and winters throughout California, except in desert areas. Migratory individuals from northern and northeastern parts of the State arrive between mid-October and December, and remain until March or early April. Most bald eagle breeding in California occurs in the northern counties (Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties), typically at low elevations; breeding in the high Sierra Nevada is rare (USDA Forest Service 2001).

Lassen National Forest has some of the most productive bald eagle breeding habitat in California (USDA Forest Service 2010). Based upon the best available data, 33 breeding territories currently exist within Lassen National Forest boundary.

Habitat Status

Bald eagles winter throughout California near lakes, reservoirs, riverine, and marsh habitats. They breed mainly in the northern portion of the state near coastlines, rivers, large lakes or streams that support an adequate food supply. They often nest in mature or old-growth trees; snags (dead trees); cliffs; rock promontories; rarely on the ground; and with increasing frequency on human-made structures such as power poles and communication towers. In forested areas, bald eagles often select the tallest trees with limbs strong enough to support a nest that can weigh more than 1,000 pounds; nest sites typically include at least one perch with a clear view of the water where the eagles usually forage (USDI Fish and Wildlife Service 2007). Egg-laying dates vary throughout the United States. On the Lassen National Forest, bald eagles initiate breeding in January. Incubation begins in late February to mid-March with the nesting period extending as late as the end of June (USDA Forest Service 2010).

Bald eagles require open water with juxtaposed mature trees or steep cliffs for nesting, perching, foraging, and roosting. This species typically perches in “large, robustly limbed trees, on snags, on broken topped trees, or on rocks near water” (Peterson 1986). Perches function as resting, preening, foraging, and feeding sites.

Roost trees are perches where one or more bald eagles rest at night and may occur long distances from open waterbodies. Roost trees are similar in structure compared to perch trees; “dominant trees that have open and robust branches, are sometimes defoliated (i.e., snags), are protected from prevailing winds, and are typically far from human development” (Anthony et al. 1982 in Murphy and Knopp 2000).

Bald eagles are usually monogamous and pair for life, though repairing may occur if either of the pair dies. The mating season varies by latitude. Pair initiation begins in January and egg-laying occurs in early May. Incubation lasts for approximately 35 days, and hatching occurs in mid-June. Both parents provide care for the nestlings for approximately 10 to 12 weeks. Juveniles fledge in late August and exhibit nest site dependency for 4 to 11 weeks following the first flight. Bald eagles require 4 to 5 years to reach sexual maturity and full adult plumage. Dispersal distances can be substantial; this species often disperses several hundred miles from the natal site. Females tend to disperse farther than males. Breeding home ranges vary substantially by location from 58 acres in Alaska to 5 acres in Arizona. Migration distances of up to 1,712 miles have been recorded. Fidelity to wintering grounds is strong (summarized in USDA Forest Service 2001).

Nest trees are “typically established in large, dominant live trees with open branch work and are often located within 1.6 km [0.96 miles] of open water” (Murphy and Knopp 2000). Nest trees must be sturdy to support the large, heavy stick nests built by this species at or just below the tree canopy (Ibid). Nests are located most frequently in stands with less than 40 percent canopy cover (Call 1978 in Murphy and Knopp 2000).

The following CWHR classes provide high capability nesting habitat for this species: Eastside Pine (5S, 5P, and 5D), Sierran Mixed Conifer (5S, 5P, 5D, and 6), and White Fir (5S, 5P, 5D, and 6). Moderate capability nesting habitats include Sierran Mixed Conifer (all strata in size classes 1 through 3) and White Fir (all strata in size classes 1 through 3). As bald eagles are known to use the Jeffrey Pine vegetation type for nesting in the Lake Tahoe basin, despite the CWHR model prediction that this vegetation type would normally provide low nesting capability for this species, the Jeffrey Pine vegetation type will be considered high capability (5S, 5P, and 6) and moderate capability (4S, 4P, and 4D) nesting habitat for the purposes of this analysis. Moderate and high capability nesting habitat is located within 1.0 mile of open water as described above. Within CWHR, size class 6 is only recognized for a subset of the forest vegetation types (Jeffrey Pine, Montane Riparian, Sierran Mixed Conifer, and White Fir).

The following CWHR classes provide high capability perching habitat for this species: Eastside Pine (5S, 5P, 5M, and 5D), Sierran Mixed Conifer (5S, 5P, and 5M), and White Fir (5S, 5P, and 5M). Moderate capability perching habitats include Eastside Pine (4S, 4P, and 4M), Juniper (5S, 5P, and 5M), Montane Hardwood (5S, 5P, and 5M), Montane Hardwood-Conifer (5S, 5P, and 5M), Sierran Mixed Conifer (all strata in size classes 1 through 3; and 5D and 6), and White Fir (all strata in size classes 1 through 3; and 5D and 6).

The following CWHR classes provide high capability foraging habitat for this species: Lacustrine (all strata except size class 3), Riverine (all strata except size class 3), Sierran Mixed Conifer (5S, 5P, and 5M), and White Fir (5S, 5P, and 5M). Moderate capability foraging habitats include Eastside Pine (all strata except 2D, 3D, 4D, and 5D), Fresh Emergent Wetland (all strata), Juniper (all strata except 2D, 3D, 4D, and 5D), Montane Hardwood (all except 5D), Montane Hardwood-Conifer (all except 5D and 6), Montane Riparian (all strata except 2D, 3D, 4D, 5D, and 6), Sierran Mixed Conifer (all strata except 5S, 5P, and 5M), Wet Meadow (all strata), and White Fir (all strata except 5S, 5P, and 5M).

There are 1,239 acres of nest sites buffered by 660 feet[28] (map BE-61) and 26,668 acres of bald eagle reproductive habitat[29] (map BE-66) on NFS lands within the Lassen National Forest boundary.

Threats

The Recovery Plan for the Pacific Bald Eagle (USDI Fish and Wildlife Service 1986) states that the main threats to this species in Sierra Nevada Mountains (Zone 28) are disturbance at wintering grounds and loss of potential nesting habitat to logging or development. The Plan's proposed management directions are maintenance of winter habitat and evaluation of potential reintroduction/expansion of 'breeders.' The most urgent site-specific task (1.3211) identified for the Forest Service in the Sierra Nevada Mountains is to prohibit logging of known nest, perch, or winter roost trees (USDI Fish and Wildlife Service 1986).

Bald eagles are also sensitive to human or recreation disturbance. Numerous studies have reported that eagles avoid or are adversely affected by human disturbance during the breeding period, which may result in nest abandonment and reproductive failure (Stalmaster and Newman 1978, Andrew and Mosher 1982, Fraser et al. 1985, Knight and Skagen 1988, Buehler et al. 1991, Grubb and King 1991, Chandler et al. 1995). The response of bald eagles to human activities is variable. Individual bald eagles show different thresholds of tolerance for disturbance. This variability may be related to

[28] 660 foot nest site buffers based on USDI Fish and Wildlife Service (2007)
[29] Ponderosa pine [CWHR (2014) types 5S, 5P, 5M, 5D)] and Sierran mixed conifer and white fir [CWHR (2014) types 5S, 5P, 5M, 5D, and 6)] within 1 mile of waterbodies and major rivers. Buffered nest sites are not included in total to prevent double counting with nest site analysis.

a number of factors, including visibility, duration, noise levels, extent of the area affected by the activity, prior experiences with humans, and tolerance of the individual nesting pair (USDI Fish and Wildlife Service 2007). Forested habitats can mute noise generated by vehicles and screen the vehicle from sight. Disturbance effects are greatest during nest building, courtship, egg laying, and incubation. However, disruption, destruction, or obstruction of roosting and foraging areas can also negatively affect bald eagles. Disruptive activities in or near eagle foraging areas can interfere with feeding, reducing chances of survival or productivity (number of young successfully fledged). Migrating and wintering bald eagles often congregate at specific sites, usually in mature trees where the eagles are somewhat sheltered from the wind and weather, for purposes of feeding and sheltering because of their proximity to sufficient food sources. Human activities near or within communal roost sites may prevent eagles from feeding or taking shelter, especially if no other undisturbed and productive feeding and roosting sites are available.

In Washington, bald eagles have been found to be adversely affected by recreation that involves both pedestrian traffic and boat use by adversely affecting feeding activity (Stalmaster and Kaiser 1998). Stalmaster and Newman (1978) found that wintering bald eagles were adversely affected by human disturbance and distribution patterns were significantly changed by human activity. Eagles were displaced in areas of high human activity and moved to areas of lower human activity. Flush distances were lower when the disturbance was on land than in the water and lower still if the eagle couldn't see the cause of the disturbance. Knight and Knight (1984) found that bald eagles became habituated to canoes in areas where they were common.

Additional studies indicate that animals, including bald eagles, infrequently demonstrated active responses to OSVs and associated human presence (USDI National Park Service 2013). In a study based on approximately 5,688 interactions[30] over four winters between groups of wildlife and groups of snowmobiles and/or snowcoaches, White et al. (2009) found the following observed responses of bald eagles to OSV use: no apparent response (17 percent), look-resume (64 percent), alert (9 percent), travel (4 percent), flight (6 percent), and defensive (0 percent). Based on these findings, it would appear that eagles have become desensitized to OSV use and other human disturbance in the park during winter to some extent (USDI National Park Service 2013).

White et al. (2009) also assessed the relationship between wildlife behavioral responses and factors including wildlife group size or distance from road, interaction time, group size of snowmobiles or snowcoaches, type of habitat, and cumulative winter OSV traffic. For bison, elk, swans, and bald eagles, the odds of a movement response (travel, flight) decreased with increasing distance of the animals from the road.

National Bald Eagle Management Guidelines (USDI Fish and Wildlife Service 2007) include a buffer of 100 meters (330 feet) for off-road vehicle use, including snowmobiles, in forested landscapes and/or variable terrain, and 200 meters (660 feet) in open landscapes where line of sight to nest trees may be a concern.

Direct and Indirect Effects

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to bald eagle are listed in table 166.

[30] An interaction sampling unit was defined as the interaction between a group of OSVs and associated humans and a group of bison or elk within 1,500 feet (500 meters) of the road.

Table 166. Resource indicators and measures for assessing effects to bald eagles

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals	Acres and percentage of reproductive habitat impacted by OSV use	7,962 (30%)	7,366 (28%)	7,087 (27%)	7,904 (30%)	6,475 (24%)
Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals	Acres and percentage of buffered bald eagle nests impacted by OSV use	741 (63%)	663 (54%)	454 (37%)	694 (56%)	137 (11%)

The Lassen National Forest currently has 26,668 total acres of high-value reproductive habitat (map BE-61) and 1,239 acres of bald eagle nest trees on NFS lands buffered by 660 feet (map BE-66).

The majority of associated risk factors within wetland and riparian habitats apply to roads and trails and primarily include the following direct effects (Gaines et al. 2003): site disturbance and potential for injury or mortality to individuals from vehicle collisions. Site disturbance includes (1) Displacement or avoidance by populations or individual animals away from human activities; and (2) Disturbance and displacement of individuals from breeding or rearing habitats. Potential for injury or mortality to individuals from vehicle collision: The likelihood of a collision between snow grooming equipment and bald eagles is extremely low because the equipment travels slowly (3 to 6 mph) and snow grooming occurs at night, when eagles are roosting. There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds, but the potential is still very low. OSV proposed actions would not physically modify any suitable bald eagle habitat within the project area.

Comparison of the Alternatives

Table 167 and table 168 show and compare, by alternative, the amount of buffered bald eagle nest sites and reproductive habitat, respectively, with the potential for direct and indirect effects (disturbance, injury, or mortality) from OSV use and related activities.

Ninety-five percent of eagle nest sites buffered by 660 feet are currently open to OSV use (alternative 1). However, 63 percent are currently open to OSV use and of moderate to high OSV use (map BE-61). Similarly, 83 percent of reproductive habitat is currently open to OSV use, but 30 percent is currently open to OSV use and of moderate to high OSV use (map BE-66). The potential for OSV-related impacts to bald eagle, including noise-based disturbance or injury/mortality, would be most likely to occur in those areas of moderate to high OSV use. In addition, of the 60 percent of buffered activity centers and the 30 percent of reproductive habitat currently open to and of moderate to high OSV use, high OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within in an even smaller percentage of each of those habitats; no nest sites are located within high OSV-use areas and only 4 nest sites are

located within 1.5 miles of designated OSV trails, where moderate use would be expected to occur. The Fish and Wildlife Service (2007) recommended nest buffer for off-road vehicle use to prevent impacts to nesting bald eagles is 660 feet. Therefore, bald eagle nest sites are not expected to be impacted under the current condition. In addition, bald eagles and their habitat are subject to the Bald Eagle Protection Act of 1940 that prohibits disturbance to bald eagles that results in injury, a decrease in productivity, or nest abandonment. The forest would use the results of ongoing inventory and monitoring of bald eagle nest sites to determine whether or not disturbance is occurring and if changes in management are necessary.

Table 167. Acres of bald eagle nest sites, buffered by 660 feet, with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	1,175	1,076	695	1,108	271
Not Designated for OSV use	64	163	544	131	968
OSV use restricted to trails	NA	NA	0	NA	0
Total	1,239 acres				
Designated for OSV use and of moderate to high OSV use (percent of total buffered area)	741 (63.1%)	663 (53.5%)	454 (36.6%)	694 (56.0%)	137 (11.1%)
Not Designated for OSV use and of moderate to high OSV use	48	126	335	95	652
Moderate to high OSV use and OSV use restricted to trails	NA	NA	0	NA	0
Total	789 acres				

Under alternative 2, the percentage of buffered eagle nests and bald eagle reproductive habitat with the potential to be impacted by OSV use is slightly less than the existing condition at 28 percent (map BE-62) and 54 percent (map BE-67), respectively. Under alternative 3, the percentage of buffered eagle nests and bald eagle reproductive habitat with the potential to be impacted by OSV use is slightly less than alternative 2 at 27 percent (map BE-55) but the percentage of buffered nest sites with the potential to be impacted by OSV use (map BE-63) is notably less at 37 percent (map BE-68). Under alternative 4, amounts of buffered eagle nest sites (map BE-64) and reproductive habitat (map BE-69) are less than alternative 1, but more than alternatives 2, 3, and 5. Under alternative 5, the percentage of reproductive habitat with the potential to be impacted by OSV use is similar to the other alternatives (24 percent; map BE-70), but the percentage of buffered nest sites with the potential to be impacted by OSV use under alternative 5 would be substantially less than the other alternatives (11 percent; map BE-65) because areas under 3,500 feet would not be designated for OSV use. Under alternatives 2 and 3, only two eagle nest sites would be located within OSV moderate use areas. However, like alternative 1, no bald eagle nest sites are within 660 feet of high or moderate OSV use areas under alternatives 2, 3, 4, or 5 and, therefore, no disturbance impacts to breeding bald eagles are expected under any of the alternatives.

Table 168. Acres of high-value bald eagle reproductive habitat with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	22,049	21,016	19,989	21,765	16,517
Not Designated for OSV use	4,619	5,652	6,679	4,093	10,151
OSV use restricted to trails	NA	NA	1	NA	1
Total	26,668 acres				
Designated for OSV use and of moderate to high OSV use (percent of total habitat)	7,962 (29.9%)	7,366 (27.6%)	7,087 (26.6%)	7,904 (29.6%)	6,475 (24.3%)
Not Designated for OSV use and of moderate to high OSV use	1,588	2,184	2,463	1,646	3,075
Moderate to high OSV use and OSV use restricted to trails	NA	NA	1	NA	1
Total	9,550 acres				

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to bald eagles, when combined with alternatives 1, 2, 3, 4, or 5, include firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Bald eagle habitat overlaps with areas open to Christmas tree cutting and firewood cutting. However, wheeled motorized vehicles may not be used off of authorized NFS roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014), there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1 and December 31) and OSV trail grooming season (beginning December 26), and disturbance or displacement from this activity would occur outside of the bald eagle breeding season under alternatives 1, 2, 3, and 5. Under alternative 4, in which trail grooming would begin at the discretion of the groomer, there is the potential for a somewhat larger degree of overlap during years in which heavy snowfall begins early. Use of roads within bald eagle habitats after the March 31 termination date of the forest order closing roads for exclusive OSV use can contribute additional disturbance during the early part of the bald eagle breeding season, particularly for nests within 0.25 mile of roads. In general, most non-motorized winter recreation occurs along designated trails, where birds would either avoid the area, if too great an impact, or habituate to the noise. Similar activities on State and private lands within the forest boundary and within one-quarter mile of bald eagle nests may impact habitat outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown; State and privately held lands make up about 20 percent of the area within the forest boundary. In summary, ongoing and reasonably foreseeable actions may locally increase the potential for disturbance to or displacement of bald eagles, but are not expected to contribute substantial impacts to those discussed for the project under any of the alternatives

Determination Statement

Alternatives 1, 2, 3, 4, and 5 of the Lassen National Forest Over-snow Vehicle Use Designation Project may affect individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for bald eagle in the project area for the following reasons:

- OSV proposed actions would not physically modify the structure or composition of suitable bald eagle habitat within the project area.
- Although the potential for noise-based disturbance to individuals within high-reproductive habitat ranges from 24 to 30 percent under all of the alternatives, the forest would use the results of ongoing inventory and monitoring of bald eagle nest sites to determine whether or not disturbance is occurring and if changes in management are necessary, thereby minimizing impacts to bald eagle.
- Although 11 percent of buffered bald eagle nests under alternative 5, 37 percent under alternative 3, and 54 to 63 percent under alternatives 1, 2, and 4 are within designated OSV use areas, no bald eagle nest sites are within 660 feet of high OSV use areas under any of the alternatives and, therefore, no disturbance impacts to breeding bald eagles are expected.
- The potential for injury or mortality from OSV collision with individual bald eagles is very low under all of the alternatives.

Great Gray Owl (*Strix nebulosa*)

Regional Foresters Sensitive Species

Species Account

The primarily nocturnal great gray owl is a Forest Service sensitive species. The great gray owl population estimate for California is fewer than 300 individuals (Wu et al. 2015). The present known population is centered in and adjacent to Yosemite National Park. Nesting activity on the Stanislaus National Forest has been documented at five distinct locations. There have also been several recent sightings on the Sierra National Forest, including a successful nest site in 2002. Recent sightings of great gray owls have also been recorded in or near Modoc, Plumas, Tahoe, Eldorado, and Toiyabe National Forests, as well as privately owned lands adjacent to the Lassen National Forest.

Sightings have been reported on the Lassen National Forest. However, to date none have been confirmed and recorded. Since 1996, there have been 15 survey efforts on various meadow/forest areas which are potential suitable habitat for the great gray owl. Additional surveys were conducted by California Department of Fish and Game in 2008. There have been no positive detections from these survey efforts.

Habitat Status

As described by Beck and Winter (2000), great gray owl (*Strix nebulosa*) require mid- or late-succession conifer forests at size class 4 (dominant and co-dominant trees 12 to 23 inches), containing large (over 24 inches dbh), broken-top snags in the forest matrix in sufficient numbers (5 to 6 snags per acre) to provide nest sites. These sites are typically red and/or white firs vegetation types; however, old and decadent black oaks have been used for nesting at lower elevations. More recently, Wu et al. (2015) characterized habitat at known nesting sites and found that 30 percent of nests were in oak trees and 21 percent were below 1,000 meters (3,281 feet), which loosely corresponds to the lower conifer-zone limit. Across all elevations and tree species, degree of deterioration was the most important factor with nest trees being significantly more decayed than paired reference trees in the same meadow.

Located suitable nest sites located were near (less than 440 yards or approximately 400 meters) montane meadows between 2,000 and 8,000 feet in elevation. Forest canopy closures are greater than 60 percent in at least some portion of the forest stands adjacent to meadows or other natural or managed herbaceous openings (i.e., patch cut regenerated forest). Foraging areas include meadows

and openings that have sufficient herbaceous cover to support pocket gophers and microtine rodents (i.e., meadow voles); pocket gophers and meadow voles are believed to comprise the majority of the owl's diet (Kalinowski et al. 2014). Meadows or portions of meadows, with standing water remaining at mid-summer, are not suitable because they would be void of these prey rodents. Potential territories include meadows which total 10 acres or more in size adjacent to these mature closed canopy forest stands (Beck and Winter 2000). Van Riper et al. (2013) found that human recreational activities seem to have a negative influence on great gray owl distribution in Yosemite National Park, particularly in remote natural areas of the park, largely avoiding those areas where people are present; in the park, owls primarily use meadows with lower levels of human activity. Loss of mature forest habitat for nesting and the degradation of montane meadows remain the major sources of habitat loss.

Potentially suitable habitat for the great gray owl is scattered across the Lassen National Forest. Most habitats meeting the above description occur on the southwestern side of the forest south and west of Lassen Volcanic National Park. Given that there have been no great gray owls confirmed breeding on the Lassen National Forest, to date, there have been no protected activity centers established. There are 86,745 acres of great gray owl high-value reproductive habitat[31] on NFS lands within the project area (table 170, page 545; map BE-71).

Direct and Indirect Effects

Resource indicators and measures (FSH 1909.15, 12.5) used in this analysis to measure and disclose effects to great gray owl are listed in table 169.

Table 169. Resource indicators and measures for assessing effects to great gray owl

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals, or habitat modification	Acres and percentage of high-reproductive habitat impacted by OSV use	32,228 (37%)	31,456 (36%)	29,852 (34%)	31,805 (37%)	26,998 (31%)

The majority of associated risk factors within wetland and riparian habitats apply to roads and trails and primarily include the following potential direct effects (Gaines et al. 2003): site disturbance and potential for injury or mortality to individuals from vehicle collisions. Site disturbance includes (1) Displacement or avoidance by populations or individual animals away from human activities; and (2) Disturbance and displacement of individuals from breeding or rearing habitats.

In addition, Gaines et al. (2003) found an interaction that occurred on winter recreation trails was the indirect effect of snow compaction on the subnivean sites used by small mammals in which small mammals can either be suffocated as a result of the compaction, or their subnivean movements can be altered owing to impenetrable compact snow. Adverse effects to subnivean animals could

[31] Areas < 440 yards (~ 400 m) to montane meadows >10 acres in size and between 2,000 and 8,000 feet in elevation with forest canopy closures >60% [CWHR (2014) closure class "D")] in at least some portion of the forest stands adjacent to meadows; habitat query includes adjacent meadows that are foraging habitat.

indirectly affect the prey base for many Forest Service sensitive species, including great gray owl, should it be present.

Although great gray owls have not been confirmed on the Lassen National Forest, they have been observed nearby, and, over time, could be affected by Forest OSV activities. Snowplay in meadows may prevent great gray owl use in or adjacent to those meadows. Like the other raptor species under consideration in this analysis, potential noise-based disturbance to breeding individuals is the primary concern. If great gray owls are present on the Lassen National Forest, the potential for disturbance to breeding individuals would be limited to the early portion of the March 1 through August 15 great gray owl breeding season that overlaps with the OSV use season.

Owls are nocturnal, whereas the majority of OSV use and associated activities on the Lassen National Forest, with the exception of trail grooming, occur during the daytime, so the potential for collisions of OSVs with great gray owls, should they be present, would be negligible and foraging behavior would generally not be interrupted.

Potential effects of noise disturbance would be the same as those noted due to OSV use. In addition, trail grooming and night riding could disturb owls that forage at night. Trails are generally located away from meadows, but the passage of a trail grooming machine on a trail adjacent to or nearby a meadow, may interrupt owl foraging, result in owl prey taking refuge, or cause owls to redirect their foraging away from that particular area. However, due to the limited frequency[32] and duration of trail grooming at any trail segment location, noise disturbance from trail grooming would probably not have a significant impact on breeding or foraging great gray owls. Although night riding could have similar impacts to foraging owls, it would be uncommon because most OSV use on the Lassen National Forest occurs during daytime hours.

Based upon OSV use patterns described in the assumptions section, once OSV trail grooming ends, it is estimated that use of those trails declines by 50 percent. Therefore, the potential for direct and indirect effects to activity centers within 0.25 mile of groomed trails would decrease substantially after March 31 for alternatives 1 through 3, limiting impacts to the first month of the great gray owl breeding season, but not necessarily for alternative 4. However, potential impacts under alternative 4 would still largely be limited to the early portion of the breeding season.

Although OSV use or related activities would not physically alter the vegetative structure of spotted owl habitat, spotted owl prey species, that use the subnivean space could be subject to OSV-related impacts from snow compaction, including suffocation or alteration of movement while foraging in the subnivean space beneath the snow. The degree of this impact is unknown, but would be more likely in areas most conductive to OSV, including meadows used by great gray owls for foraging.

Comparison of the Alternatives

Table 170 displays, by alternative, the acres of great gray owl reproductive habitat, with the potential for direct and indirect effects from OSV use and related activities. Eighty-nine percent of great gray owl reproductive habitat is currently open to OSV use (alternative 1). However, 37 percent is currently open to OSV use and of moderate to high OSV use (map BE-71). The potential for OSV-

[32] Grooming operations at most trail systems currently operate near a maximum level. Trails are prioritized for grooming based on visitor use. Grooming on priority trails occurs several times per week and after significant storms. The total hours of trail grooming occurring expected at each site for an average season vary from 94 annual snowcat hours at Swain Mountain to 680 hours at Bogard and Fredonyer on the Lassen National Forest. Snow removal on access roads and trailhead parking areas, serving the OSV Program trail systems, occurs several times during storm events, as necessary dependent upon weather conditions (CA Parks and Recreation 2010).

related impacts (noise-based disturbance, snow compaction impacting subnivean space of prey species, or injury/mortality) to great gray owls, should they be present, would be most likely to occur in those areas of moderate to high OSV use. In addition, of the 37 percent of habitat currently open to and of moderate to high OSV use, high OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within in an even smaller percentage of each of those habitats. This would be true under the other three alternatives.

Under alternative 2, 36 percent of great gray owl reproductive habitat would be designated and of moderate to high OSV use (map BE-72). Approximately, 34 percent would be designated and of moderate to high OSV use under alternative 3 (map BE-73), and 37 percent under alternative 4 (map BE-74). Alternative 5 is slightly less at 31 percent (map BE-75). In the event that great gray owls are found on the forest, as previously noted, the potential for OSV-related noise-based disturbance would overlap with only the early part of the March 1 through August 15 great gray owl breeding season. In addition, nest sites with potential to be impacted would be monitored to determine whether disturbance is occurring and if changes in management, including a limited operating period around nest sites, are necessary, thereby minimizing impacts to great gray owl.

Table 170. Acres of high-value great gray owl reproductive habitat with highest potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Designated for OSV use	77,457	75,147	70,300	76,384	61,136
Not Designated for OSV use	9,288	11,598	16,445	10,361	25,609
OSV use restricted to trails	NA	NA	16	NA	16
Total	86,745 acres				
Designated for OSV use and of moderate to high OSV use (percent of habitat total)	32,228 (37.2%)	31,456 (36.3%)	29,853 (34.4%)	31,805 (36.7%)	26,998 (31.1%)
Not Designated for OSV use and of moderate to high OSV use	3,669	4,401	5,997	4,039	8,838
Moderate to high OSV use and OSV use restricted to trails	NA	NA	8	NA	8
Total	35,897 acres				

Cumulative Effects

Based upon spatial data provided by the Lassen National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to great gray owl, when combined with alternatives 1, 2, 3, 4 or 5, include those with the potential for disturbance to or displacement of great gray owls such as the vegetation management projects, fire salvage projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the highest OSV use occurs. Limited operating periods required for vegetation management and road construction reduce impacts near known great gray owl nest sites. In addition, vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires

Great gray owl habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. However, wheeled motorized vehicles may not be used off of authorized NFS roads or motorized trails to scout for fuelwood or to harvest Christmas trees (USDA Forest Service 2014), there would be minimal overlap between the Christmas tree and firewood cutting season (annually between November 1 and December 31) and OSV trail grooming season (beginning December 26), and disturbance or displacement from this activity would occur outside of the great gray owl breeding season under alternatives 1, 2, 3, and 5. Under alternative 4, in which trail grooming would begin at the discretion of the groomer, there is the potential for a somewhat larger degree of overlap during years in which heavy snowfall begins early. Use of roads within great gray owl habitats after the March 31 termination date of the forest order closing roads for exclusive OSV use could contribute additional disturbance during the early part of the great gray owl breeding season, particularly for nests within 0.25 mile of roads. However, no great gray owl nests have been identified on the Lassen National Forest.

In general, most non-motorized winter recreation occurs along designated trails, where birds would avoid roosting in the area, if too great a disturbance, or habituate to the noise. Similar activities on State and private lands within the forest boundary and within one-quarter mile of goshawk habitats may impact habitat availability outside of NFS lands and may increase disturbance locally. However, the potential for this type of disturbance is unknown; State and privately held lands make up about 20 percent of the area within the forest boundary. In summary, ongoing and reasonably foreseeable actions could be additive locally to individual great gray owls, but are not expected to contribute substantial impacts to those discussed for the project under any of the alternatives.

Determination Statement

Alternatives 1, 2, 3, 4, and 5 of the Lassen National Forest Over-snow Vehicle Use Designation Project may affect individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for great gray owl in the project area for the following reasons:

- Structure or composition of great gray owl habitat would not be physically modified by OSV use and related activities.
- Although the potential for noise-based disturbance to individuals within high-reproductive habitat ranges from 31 to 37 percent under all of the alternatives, great gray owls have not been confirmed on the Lassen National Forest. In the event that great gray owls are found on the forest, the potential for OSV-related noise-based disturbance would overlap with only the early part of the March 1 through August 15 great gray owl breeding season, and nest sites with potential to be impacted would be monitored to determine whether disturbance is occurring and if changes in management, including a limited operating period around nest sites, are necessary, thereby minimizing impacts to great gray owl.
- Due to their nocturnal behavior, great gray owls, if present, would be expected to have little interaction with snowmobiles or snow grooming equipment resulting in very little potential for direct effects from snowmobiles or grooming equipment.

Willow Flycatcher (*Empidonax trailii*)

Regional Foresters Sensitive Species

Species Account

The willow flycatcher (*Empidonax trailii*) is a Forest Service Sensitive species.

This Neotropical migrant species breeds within the contiguous United States, except the Southeast, and the southern margins of Canada (Green et al. 2003) and winters from Mexico to northern South America (USDA Forest Service 2001). Three subspecies occur in California: *E. t. extimus* (southern California), *E. t. brewsteri* (north of Fresno County from the Pacific coast to the western slopes of the Sierra Nevada crest), and *E. t. adastus* (on the eastern slopes of the Sierra Nevada and Cascade ranges, including the Lake Tahoe basin – a watershed that drains to the east of the Sierra crest) (summarized in USDA Forest Service 2001and Green et al. 2003). The latter subspecies, *E. t. adastus*, occurs and breeds from May through September (Ibid) and winters from the Mexican state of Colima to northwestern Venezuela (USDA Forest Service 2001).

Historically, this species likely occurred in suitable habitats throughout California and portions of Nevada including the central coast, Central Valley, Sierra Nevada, and Great Basin (summarized in USDA Forest Service 2001). Willow flycatchers were common in the Sierra Nevada until as recently as 1910, and locally abundant through 1940 (Ibid). However, this species has declined precipitously in the Sierra Nevada since 1950 (summarized in Green et al. 2003). Urbanization and the draining, channelization, and filling of wetlands; grazing; mining; and pesticide use are likely responsible for the decline in range and abundance of this species.

Livestock grazing, predation, and human activity have all been considered threats to flycatcher nesting habitat. Poorly managed grazing can alter the hydrologic and vegetative characteristics of meadows and contribute to poor quality habitat for nest selection and increased visibility (vulnerability) of nests to predation (Stanley and Knopf 2002). Nest predation is the leading cause of nest failure in willow flycatcher nests (Mathewson et al. 2011).

In the past three decades, willow flycatchers have undergone substantial population declines in California. Multiple factors likely contributed to the decline including poor quality of meadow habitat, shortened breeding-season length and stochastic weather events, the initial small population size, and low reproduction that influenced dispersal dynamics (Mathewson et al. 2011). Nest predation was the primary cause of nest failure at their study sites. The authors recommend two types of restoration, including: (1) restoring meadows currently occupied by willow flycatchers, and (2) restoring meadows within 5 miles of occupied sites to provide habitat for dispersing flycatchers. Mathewson et al. (2011) suggest that restoration could enhance nest success and recommend increasing riparian shrub cover (e.g., willow) and improving meadow wetness to both increase vegetation and reduce predation rates on nests, fledglings, and adults.

Willow flycatchers currently occur and breed in areas (e.g., Upper Truckee River watershed) where they were thought to have “all but disappeared” (USDA Forest Service 2001), though at very low densities and with limited reproductive success. The recent extirpation of this species from Yosemite National Park, where suitable habitats are presumably better preserved than those located outside the park suggests that other factors may be contributing to the decline of this species in the Sierra Nevada (Siegel et al. 2008). Siegel et al. (Ibid) tentatively suggested that severe habitat degradation during the 19th century (due to grazing, which was discontinued in Yosemite National Park decades ago), meadow desiccation (due to global warming and resulting in earlier spring melts and a

reduction in site wetness), disrupted meta-population dynamics, or conditions on the wintering grounds or along migration routes may explain the decline in Yosemite National Park.

Lassen National Forest has one of the largest concentrations of breeding willow flycatcher in the Sierra Nevada; most birds are located in Warner Valley Ecological Reserve, managed by California Department of Fish and Game (CDFG), situated upstream from Lake Almanor and near the southwestern boundary of Lassen Volcanic National Park (USDA Forest Service 2010). Earliest arrival dates range from late May to early June in the southern Sierra Nevada to the first of June in the northern Sierra Nevada (Green et al. 2003).

Habitat Status

Suitable habitat (i.e., the combination of resources and environmental conditions required to survive and reproduce) for this species in the Sierra Nevada is defined by site elevation, shrub coverage, foliar density, wetness, and meadow size (summarized in Green et al. 2003). Known willow flycatcher sites range in elevation from 1,200 to 9,500 feet, though most (88 percent, 119 of 135) are located between 4,000 and 8,000 feet (Stefani et al. 2001). Willow flycatchers are closely associated with meadows that have high water tables in the late spring and early summer, and abundant shrubby, deciduous vegetation (especially *Salix* spp.). Shrubs in these preferred habitats are typically 6.5 to 13 feet in height, with the lower half composed of dense woody stems. Live foliage density within the shrub layer is moderate to high and uniform from the ground to the shrub canopy (summarized in USDA Forest Service 2001). Sites are "significantly more likely to support multiple willow flycatchers, and result in successful breeding efforts, as riparian shrub cover in meadows and willow flycatcher territories increases" (Bombay 1999 as cited in USDA Forest Service 2001).

Within preferred sites, "the herbaceous community is consistent with high water tables and late seral conditions" (Ibid). Furthermore, this species prefers and is significantly more likely to occupy and defend territories that have standing water or saturated soils during the breeding season, often selecting the wettest portions within meadows (summarized in USDA Forest Service 2001). Occupied meadows range in size from less than 1.0 acre to 716 acres, averaging approximately 80 acres (USDA Forest Service 2001). More than 95 percent of breeding meadows are larger than 10 acres, and meadows where multiple territories have fledged young are larger than 15 acres (summarized in Green et al. 2003). This species exhibits some site fidelity; 15 percent of adult birds tarsal-banded in the Sierra Nevada in 1997 and 1998 returned in a subsequent year, compared to 31 percent at the Kern River Preserve (California), and 50 percent at Malheur National Wildlife Refuge in southeastern Oregon (summarized in Bombay et al. 2003). Between-year site fidelity on wintering grounds in Costa Rica averaged 68 percent (Koronkiewicz et al. 2006).

The CWHR model describes high to moderate capability nesting habitats in the montane riparian vegetation type (high = 2D, 3D, 4M, and 4D; moderate = 2M, 3M); high to moderate capability perching habitats in the montane riparian vegetation type (high = greater than 2P; moderate = 2P); and high capability foraging habitat (no moderate capability habitats described) in the montane riparian (all strata except 1 and 2S) and wet meadow (all strata) vegetation types for this species. Similarly, as *E. t. adastus* nests locally in wet meadows, high and moderate capability perching habitat will include wet meadow (high = all strata) and montane riparian (high = greater than 2P; moderate = 2P) vegetation types. High capability foraging habitat, as described in CWHR (no moderate capability habitats described), will include montane riparian (all strata except 1 and 2S) and wet meadow (all strata).

Sanders and Flett (1989) reported the average territory size for a paired male willow flycatcher as approximately 0.84 acre (range = 0.145 to 2.19) in the central Sierra Nevada. This species typically

nests from June 1 to August 31 and fledges young between July 15 and August 31. Fledglings remain in territories for 2 for 3 weeks after fledging (USDA Forest Service 2004). However, these dates vary due to factors such as when willow flycatchers arrive on the breeding grounds, snowpack, late spring and summer weather, nest predation, and brown-headed cowbird parasitism (Green et al. 2003).

This species may attempt nesting as many as three times during a single breeding season in the Sierra Nevada (USDA Forest Service 2004). Nest predation has been positively associated with edge effects, distance of the nest to edges and isolated trees, and aspects of meadow size and wetness (Cain and Morrison 2003). Meadow restoration (i.e., restoring natural hydrologic regimes, mitigating erosion, and stemming forest encroachment) was suggested to reduce predation of willow flycatcher nests (Green et al. 2003). Conservation concerns begin at parasitism rates of approximately 30 percent (Green et al 2003) and management actions to control cowbirds may be warranted above a 60 percent parasitism rate (USDA Forest Service 2004).

Willow flycatchers are insectivorous and known to hawk prey in flight and to aerially glean prey from foliage. Foraging occurs from perches within the territory. Average foraging flights are reported to be very short (mean=13 feet, range=up to 33 feet) (summarized in Sanders and Flett 1989).

Degradation and alteration of willow flycatcher habitat (i.e., montane meadows) is a primary factor contributing to population declines (Green et al. 2003). Degradation could include, but is not limited to: (1) alterations to the hydrological patterns leading to meadow drying, (2) destruction of shrub vegetation resulting in loss of nesting sites and cover for predator avoidance, (3) increased predator access to meadow interior, (4) loss of foraging substrate and decreased insect abundance, and (5) potentially increased contact with brown-headed cowbirds (Green et al. 2003).

Direct and Indirect Effects

Green et al. (2003) identified meadow degradation, which results in meadow drying, loss of nesting and foraging substrates, increased predator access to meadow interiors, and potentially cowbird parasitism as among the key factors likely responsible for the decline of the willow flycatcher. Minimum cross-country snow depth requirements under all of the alternatives, including the existing condition, is expected to be adequate to protect vegetation from measurable impacts (McNamara 2016). Emissions from OSVs, particularly two-stroke engines on snowmobiles, release pollutants like ammonium, sulfate, benzene, PAHs and other toxic compounds that are stored in the snowpack; during spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding waterbodies (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the project hydrology report (project record) for additional information). However, the minimum cross-country snow depth of 12 inches under alternatives 2, 3, and 5 is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to water quality (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage, including impacts to water quality.

Cumulative Effects

None; the Lassen National Forest Over-snow Vehicle Use Designation Project would not result in measurable direct or indirect impacts to the willow flycatcher and, therefore, there would be no cumulative impacts to this species.

Determination Statement

None of the alternatives of the Lassen National Forest Over-snow Vehicle Use Designation Project would impact willow flycatcher or its habitat in the project area for the following reasons:

- Willow flycatcher is a Neotropical migrant that arrives well past the end of the OSV season of use, so no direct impacts to the species would occur.
- OSV use has not been identified as a factor in meadow degradation for this species, and the minimum cross-country snow depth of 12 inches under alternatives 2, 3 and 5, as well as the minimum snow depth to prevent resource damage requirement under alternatives 1 and 4, is expected to protect meadow and riparian habitats from measurable impacts to water quality or vegetation.

Greater Sandhill Crane (*Grus Canadensis tabida*)

Regional Foresters Sensitive Species

Species Account

Greater sandhill cranes, including breeding individuals, have been documented on the Lassen National Forest.

Habitat Status

The California breeding population of sandhill cranes winters chiefly in the Central Valley and peak breeding occurs between May and July. High reproductive habitats for sandhill crane include fresh emergent wetland, irrigated hayfield, and wet meadow (CWHR 2014).

Much of the wetland acres on Lassen National Forest, which are important to waterfowl and sandhill crane, are ephemeral; flooding occurs from snow melt and staging and breeding occurs in spring and early summer (USDA Forest Service 2010). Threats to greater sandhill crane include destruction and degradation of structurally diverse wet meadow and shallow emergent wetland habitats used for nesting and rearing habitat by conversions for road development, croplands, and water diversions (USDA Forest Service 2010); predation; human disturbance of crane pairs during the nesting season; and the spread of invasive plants into greater sandhill crane habitats (USDI Fish and Wildlife Service 2015a).

Direct and Indirect Effects

Emissions from OSVs, particularly two-stroke engines on snowmobiles, release pollutants like ammonium, sulfate, benzene, PAHs and other toxic compounds that are stored in the snowpack; during spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding waterbodies (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the project hydrology report (project record) for additional information). However, the minimum cross-country snow depth of 12 inches under alternatives 2, 3, and 5 is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage, including effects to water quality.

Cumulative Effects

None; the Lassen National Forest Over-snow Vehicle Use Designation Project would not result in measurable direct or indirect impacts to greater sandhill crane and, therefore, there would be no cumulative impacts to this species.

Determination Statement

None of the alternatives of the Lassen National Forest Over-snow Vehicle Use Designation Project would impact greater sandhill crane or its habitat in the project area for the following reasons:

- Greater sandhill crane is a migratory species that breeds outside of the OSV season of use, so no direct impacts to the species would occur.
- OSV use has not been identified as a factor in meadow degradation for this species, and the minimum cross-country snow depth of 12 inches under alternatives 2, 3 and 5, as well as the minimum snow depth to prevent resource damage requirement under alternatives 1 and 4, is expected to protect meadow and riparian habitats from measurable impacts to water quality or vegetation.

Yellow Rail (Coturnicops noveboracensis)

Regional Foresters Sensitive Species

Species Account

The continuous breeding range of the yellow rail is from southcentral Northwest Territories through eastern Alberta, Saskatchewan, Manitoba, Ontario, southern Quebec, New Brunswick, and Maine, and south to northern New Hampshire, Vermont, New York, Michigan, Wisconsin, Minnesota, North Dakota, and northeastern Montana; a small, separate breeding population is located in southcentral Oregon. (Goldade et al. 2002). The species has been documented year-round in California, but in two primary seasonal roles: as a very local breeder in the northeastern interior and as a winter visitor (early October to mid-April) on the coast and in the Suisun Marsh region (Shuford and Gardali 2008). There is a single known observation of yellow rail on the Eagle Lake Ranger District of the Lassen National Forest.

Habitat Status

The length of the breeding season is poorly known in California, but on the basis of information from Oregon, it probably extends from May through early September (Shuford and Gardali 2008). Yellow rails prefer wet meadows, fens, boggy swales, floodplains, montane meadows, and emergent vegetation in fresh and brackish wetlands (Goldade et al. 2002).

Direct and Indirect Effects

California is outside of the continuous breeding range of the yellow rail and it appears to be primarily a winter visitor to the coastal and central portion of the state, as there are no recent records of reproduction in the state. The minimum cross-country snow depth of 12 inches under alternatives 2, 3, and 5, as well as the minimum snow depth to prevent resource damage requirement under alternatives 1 and 4, is expected to be adequate to protect grasslands, wet meadow and fresh emergent wetland habitats used by this species from measurable impacts to vegetation or water quality. Therefore, no direct or indirect impacts are expected from the actions.

Cumulative Effects

None; the Lassen National Forest Over-snow Vehicle Use Designation Project would not result in measurable direct or indirect impacts to the yellow rail and, therefore, there would be no cumulative impacts to this species.

Determination Statement

None of the alternatives of the Lassen National Forest Over-snow Vehicle Use Designation Project would impact yellow rail or its habitat in the project area based on the following:

- There are no recent records of yellow rail reproduction within California.

- Based upon available information, the species appears to be limited to being a seasonal migrant within the project area, so no direct impacts to the species would occur.
- The minimum cross-country snow depth requirements under all alternatives is expected to be adequate to protect grasslands, wet meadow and fresh emergent wetland habitats used by this species from measurable impacts to vegetation or water quality.

Western Pond Turtle (*Emys marmorata*)

Regional Foresters Sensitive Species

Species account

The western pond turtle (*Emys marmorata*) is found on the west coast of North America. Historically, it was found from as far north as British Columbia, Canada, to as far south as Baja California, mostly west of the Cascade-Sierra crest (Lovich and Meyer 2002). Disjunct populations have been documented in the Truckee, Humboldt, and Carson Rivers in Nevada, Puget Sound in Washington, and the Columbia Gorge on the border of Oregon and Washington. It is unclear if these are relictual or introduced populations (Lovich and Meyer 2002). Western pond turtles are the only native aquatic turtle in California and southern Oregon, and in the northern part of its range, it coexists with only the western painted turtle (*Chrysemys picta bellii*) (Germano and Rathbun 2008).

On Region 5 lands, this turtle can be found on all national forests, except the Inyo and Lake Tahoe Basin.

Official taxonomy by the Society for the Study of Amphibians and Reptiles no longer recognizes subspecies for the western pond turtle. Presumably, this is based on recent genetic work that indicates that the recognized subspecies were not geographically or genetically correct, and the currently recognized species likely represents as many as four cryptic species. However, the study that identified the four distinct clades of pond turtle did not elevate any to species status as the authors wanted to wait until further molecular work was undertaken. The two former subspecies were the northwestern pond turtle (*Emys marmorata marmorata*) and the southwestern pond turtle (*Emys marmorata pallida*) with a subspecies split along the transverse mountain range in southern California (Spinks and Shaffer 2005).

Abundance has been well studied in this species. In some stream habitats, densities can exceed 1,000 turtles per hectare. In Oregon, small ponds can hold over 500 turtles per hectare. These densities represent extremes with typical densities ranging from 23 to 214 turtles per hectare throughout most of the range (Lovich and Meyer 2002). Capture rates at one site in southern California were ca. 2 to 2.6 turtles per trap night (Germano 2010). These density estimates are likely accurate for populations on NFS lands where habitat is suitable.

Habitat Status

The western pond turtle inhabits a Mediterranean climate defined by mild, wet winters and long hot, dry summers. In the northern portion of its range, winters are colder with more rainfall than in southern areas (Germano and Rathbun 2008). Aquatic habitats include lakes, natural ponds, rivers, oxbows, permanent streams, ephemeral streams, marshes, freshwater and brackish estuaries and vernal pools. Additionally, these turtles will use human-made waterways including drainage ditches, canals, reservoirs, mill ponds, ornamental ponds, stock ponds, abandoned gravel pits, and sewage treatment plants. Turtles captured at waste-water treatment plants grew quickly, had successful recruitment, and produced large clutches (Germano 2010). Turtles favor areas with offshore basking sites including floating logs, snags, protruding rocks, emergent vegetation and overhanging tree

boughs, but also will use steep and/or vegetated shores. Terrestrial habitats are less well understood. In southern California, animals spend only one to two months in terrestrial habitats while animals in the northern portions of the range can be terrestrial for up to eight months (Lovich and Meyer 2002). Animals have been documented to overwinter under litter or buried in soil in areas with dense understories consisting of vegetation such as blackberry, poison oak, and stinging nettle, which reduces the likelihood of predation (Davis 1998).

Western pond turtles are generalist omnivores and have been documented to eat a wide variety of prey. Prey items include larval insects, midges, beetles, filamentous green algae, tule and cattail roots, water lily pods, and alder catkins (Germano 2010).

Turtles move upland at different times across the range of this species. Animals can move upland as early as September, but typically move following the first winter storm in November or December. Not all animals move upland, some move to nearby ponds for the winter (Davis 1998). Upland animals remain somewhat active throughout the winter and can be observed basking on warm winter days (Davis 1998). Upland movements for both overwintering and reproduction typically occur in the afternoon and evenings. Walkabouts to scout for nest sites can be completed within one day or they can last up to four days (Crump 2001). Home ranges differ between males and females with male home ranges averaging 0.976 hectares and females averaging 0.248 hectares.

Local climatic and water level variations can alter the timing of nesting in this species (Crump 2001). The nesting season is from late April through mid-July at low elevation, and June through August at higher elevations (Scott et al. 2008). Although some females can reproduce with a carapace length as small as 111 millimeters, 120 millimeters is the minimum reproductive size in most areas with most gravid females being 140 millimeters or larger (Scott et al. 2008). Animals of this size are often at least 7 years old in southern areas and 8 to 12 years old in northern areas.

Some western pond turtles have shown nest site fidelity. Four of five detected nesting areas in one study area had instances of nest site fidelity. It is likely that nest site fidelity is common, and sites are changed only after a negative encounter during either a walkabout or while forming a nest at a particular site (Crump 2001). Most females nest within 50 meters (0.03 mile) of water; however some females nest upwards of 400 meters (0.25 mile) away from water (Lovich and Meyer 2002). It is believed that in coastal populations nesting occurs far from water to protect overwintering hatchlings from being injured during winter floods (Lovich and Meyer 2002).

Mean clutch size ranges from 4.5 ± 0.25 on the Santa Rosa Plateau to 7.3 ± 1.18 in southern Oregon. More research is needed to determine if clutch size varies with latitude (Germano and Rathbun 2008). Average annual egg production for 39 animals in southern California was 7.2 ± 3.9 eggs. This number did not vary statistically among females of differing carapace length or among different streams and in many cases represented two clutches per female. Clutch size varies significantly among drainages; however, it does not differ significantly across years or within individual drainages. When double clutching occurs, the first clutch typically contains more eggs than the second clutch (Scott et al. 2008).

Hatchlings in the Mojave River population overwinter in the nest and emerge as early as March of the following year (Lovich and Meyer 2002). However, most hatchlings in southern California emerge in late fall of the year they were laid. Northern animals typically emerge the following spring. Delayed emergence can be caused by soil structure, where sandy soil results in earlier emergence (Crump 2001). Microhabitat use, behavior, and diet differ between juvenile and adult western pond turtles (Lovich and Meyer 2002). Little is known about the specific requirements of

hatchling turtles as they are cryptic and are rarely represented in population assessments of many species including those with known stable populations (Germano and Rathbun 2008).

Growth and maturation in western pond turtles is heavily influenced by ambient air and water temperatures and basking behaviors, which include aerial basking, and cryptic behaviors such as burying in warm sand or lying in warm algal mats (Germano and Rathbun 2008). Sites with cold water require turtles to bask more, causing average body size to be smaller compared to sites with warmer water. Areas that have higher invertebrate densities, typically classified as having organic mud bottom substrates, yield larger turtles (Lubcke and Wilson 2007).

Threats/Management Concerns

Western pond turtles have significantly declined in number with many populations representing less than 10 percent of the historical population. In California alone, there has been a loss of 80 to 85 percent of western pond turtles since the 1850s. The Puget Sound population in Washington, which encompassed the type location for this species as well as British Columbia populations, has been considered extirpated since at least the 1970s. Ninety-eight percent of the population is gone in Oregon's Willamette Valley, 95 to 99.9 percent of the population in the San Joaquin Valley is gone, and most of the Nevada populations have disappeared.

The major threat to this species is habitat loss or degradation. Most of the historical habitat for this species has been permanently lost as a result of development for human occupancy. Riparian and wetland habitats are cleared for agriculture use, destroyed by cattle, channelized and stripped of vegetation, or invaded by the saltcedar shrub, which destroys water quality, alters stream structure, and dries streams. Groundwater pumping lowers water tables and further stresses riparian plant communities. Gold and gravel mining can directly destroy habitat as well as introduce toxins through toxic spills and illegal dumping of chemicals (Lovich and Meyer 2002).

Additional human-related threats further jeopardize population viability. Cattle grazing destroys riparian habitat, cattle trample and kill turtles and nests, and cattle waste pollutes waterways. Western pond turtles, especially gravid females, are easily killed on roadways by direct impact with vehicles. Historically, animals were also collected for the pet trade with hundreds of animals from a single site being exported to Europe in the 1960s. Although collection and sale of western pond turtles have been banned for many years, animals are still listed for sale in the eastern United States. Animals were collected for food in great numbers from the mid-19th century to the 1930s when animals first started to become scarce. Modern watercourse recreation also impacts these turtles.

Disease poses a notable threat to western pond turtles, as seen in Washington. A die-off in 1990 was attributed to a syndrome similar to an upper-respiratory disease. Several years later, as part of a head-starting program, several animals were found dead with no apparent cause of death (Vander Haegen et al. 2009). Animals from a wastewater treatment pond in California were found to be less healthy in both the short and long term compared to animals in a natural habitat despite being larger in size. Although larger, these animals had more chronic stress from more interactions with humans and invasive species, increased water pollution, and greater exposure to water-borne diseases (Polo-Cavia et al. 2010). Dehydration also poses a threat to turtles under a year old, which likely makes these animals more susceptible to disease (Vander Haegen et al. 2009).

In addition to threats that affect entire populations, many populations are failing as a result of extremely high juvenile mortality. While adults may have annual survival rates of 95 to 97 percent, nests, juveniles, and sub-adults have extremely high mortality rates (Vander Haegen et al 2009). Nests are also destroyed when exposed to too much moisture or are crushed by cattle or machines.

There are many predators of hatchling turtles, including two very successful nonnative predators—large-mouth bass and bullfrogs. Sub-adult mortality can be as high as 85 to 90 percent annually for animals under 4 years old, however head-started sub-adults had mortalities as low as 10 percent when carapace length was greater than 90 millimeters. Natural predators that have been documented to take sub-adult turtles include: raccoons, coyotes, black bears and western river otters, with most predations occurring while the animal was terrestrial (Vander Haegen et al. 2009). Adults face less predation risk. A study documented one predation of an adult turtle by a loon, and only 3 of 196 turtles had evidence of predation attempts such as shell or limb damage (Davis 1998).

Direct and Indirect Effects

Western pond turtles have been documented to overwinter under litter or buried in soil in areas with dense understories consisting of vegetation such as blackberry, poison oak and stinging nettle, which reduces the likelihood of predation (Davis 1998). Since these areas would be under snow, there should not be a direct impact to the species unless individuals leave their hibernation burrows for brief periods of time, in which case there would be a low likelihood for trampling by OSVs or grooming equipment. There are no known areas of overwintering on the Lassen.

Indirect effects include the risk of oil, gas, or other vehicle fluids entering the waterway and modifying the prey/food base or water quality for breeding and basking. The potential for these risks is extremely low as no OSV use occurs on waterways.

Western pond turtles hibernate and, therefore, would be absent from the area of potential effect during the OSV season of use. Since they are known to either build a burrow or overwinter amongst shrubs, or other underground structures that would not be impacted by OSVs or underground. OSVs generally do not create a permanent trail or have direct impact on soil and ground vegetation when snow depths are sufficient to protect the ground surface (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the McNamara (2016) for additional information). All of the project alternatives would maintain a minimum snow depth of 12 inches in areas designated for cross-country use, which should provide sufficient depth to protect the ground surface.

Western pond turtles utilize riparian and/or aquatic environments during the breeding season. Emissions from OSVs, particularly two-stroke engines on snowmobiles, release pollutants like ammonium, sulfate, benzene, PAHs and other toxic compounds that are stored in the snowpack; during spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding waterbodies (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the project hydrology report (project record) for additional information). However, the minimum cross-country snow depth of 12 inches under alternatives 2, 3, and 5 is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage, including water quality and existing vegetation.

Cumulative Effects

Past, present, and foreseeable future actions identified to have the potential to result in a cumulative impact to terrestrial wildlife species, when combined with alternatives 1, 2, 3 4, or 5 include the Castle Defensible Fuel Profile Zone 2 vegetation management project, Dutch and Tamarack fire salvage projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Firewood and Christmas tree cutting, and non-motorized winter recreational activities are unlikely to directly impact western pond turtles that are hibernating under the snow. There is a small potential for an additive effect from vehicle fluids from wheeled vehicles used to

access firewood and Christmas trees, as well as from the use of wheeled vehicles during the overlap season between OSVs and wheeled vehicles, to enter waterways, modifying the prey/food base or water quality for breeding and basking. However, the risk for this impact is low because vehicle use does not occur in waterways and fluids would not normally reach waterways. The Castle Defensible Fuel Profile Zone 2 is proposed on 39 acres. The Dutch and Tamarack fire salvage projects would remove standing dead or dying trees across roughly 1,500 and 1,300 acres, respectively, of coniferous forest. Vegetation and fuels management activities in recent years have included primarily thinned, masticated, and/or burned vegetation to reduce the potential for catastrophic wildfires and include riparian area protections. Similar activities on State and private lands that make up about 20 percent of the area within the forest boundary may have the similar potential for limited impacts to western pond turtles and their habitat.

Determination Statement

Alternatives 1, 2, 3, 4, and 5 of the Lassen National Forest Over-snow Vehicle Use Designation Project may impact individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for western pond turtle in the project area based on the following:

- Proposed actions would not physically modify western pond turtle habitat.
- Proposed actions would occur when the species is hibernating under the snow and, therefore, would not result in noise impacts or impacts to foraging or breeding unless individuals leave their hibernation burrows for brief periods of time, in which case, there would be a low likelihood for trampling by OSVs or grooming equipment.
- The low risk of modification of the prey/food base or water quality for breeding and basking from oil, gas, or other vehicle fluids entering waterways would be mitigated by the minimum cross-country snow depth requirements that would protect aquatic and riparian habitats from measurable impacts to vegetation or water quality.

Shasta Hesperian Snail (*Vespericola Shasta*)

Regional Foresters Sensitive Species

Species Account

Shasta Hesperian snail is endemic to the Klamath Province, primarily in the vicinity of Shasta Lake, up to 915 meters elevation (USDI BLM 1999). The type locality was given as La Moine, Shasta County, California (Cordero and Miller 1995). Although Shasta Hesperian snail has been documented on the Lassen National Forest, the records are questionable, based on its distance from the type locality and elevation.

Habitat Status

Shasta Hesperian snail has been found in moist bottom lands, such as riparian zones, springs, seeps, marshes, and in the mouths of caves (USDI BLM 1999).

Direct and Indirect Effects

All observations were made in 2000 near the northeastern portion of the forest in areas that would be expected to receive low OSV use. In the event the records are accurate, the Shasta Hesperian snail would be expected to hibernate or be beneath the snow surface where no OSV-related impact would occur. In addition, the minimum cross-country snow depth of 12 inches under alternatives 2, 3, and 5 is expected to be adequate to protect moist bottomland habitats utilized by this species from

measurable impacts to vegetation or water quality (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage, including water quality.

Emissions from OSVs, particularly two-stroke engines on snowmobiles, release pollutants like ammonium, sulfate, benzene, PAHs and other toxic compounds that are stored in the snowpack; during spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding waterbodies (USFS National Core BMP Rec-7: Over-Snow Vehicle Use; please refer to the project hydrology report (project record) for additional information). However, the minimum cross-country snow depth of 12 inches under alternatives 2, 3, and 5 is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage, including water quality.

Cumulative Effects

None; the Lassen National Forest Over-snow Vehicle Use Designation Project would not result in measurable direct or indirect impacts to the Shasta Hesperian snail and, therefore, there would be no cumulative impacts to this species.

Determination Statement

None of the alternatives of the Lassen National Forest Over-snow Vehicle Use Designation Project would impact Shasta Hesperian snail or its habitat in the project area based on the following:

- Proposed actions would occur when the species is hibernating under the snow and, therefore, would not result in noise impacts or impacts to foraging or breeding.
- The minimum cross-country snow depth requirements under all alternatives is expected to be adequate to protect moist bottomland habitats used by this species from measurable impacts to vegetation or water quality.

Terrestrial Invertebrates

Western Bumble Bee (*Bombus occidentalis*)

Regional Foresters Sensitive Species

Species Account

Historically, the western bumble bee was one of the most broadly distributed bumble bee species in North America (Cameron et al. 2011). The species was broadly distributed across western North America along the Pacific Coast and westward from Alaska to the Colorado Rocky Mountains (Thorp and Shepard 2005, Koch et al. 2012). Currently, the western bumble bee occurs in all states adjacent to California, but is experiencing severe declines in distribution and abundance due to a variety of factors including diseases and loss of genetic diversity (Tommasi et al. 2004, Cameron et al. 2011, and Koch et al. 2012).

Bumble bees introduced from Europe for commercial pollination apparently carried a microsporidian parasite, *Nosema bombi*, which has been introduced into native bumble bee populations. Highest incidences of declining western bumble bee populations are associated with highest infection rates with the *Nosema* parasite, and the incidence of *Nosema* infection is significantly higher near greenhouses that use imported bumble bees for pollinating commercial crops (Cameron et al. 2011).

Although the general distribution trend is steeply downward, especially in the west coast states, some isolated populations in Oregon and the Rocky Mountains appear stable (Rao et al. 2011, Koch et al. 2012). The overall status of populations in the West largely depends on geographic region: populations west of the Cascade and Sierra Nevada mountains are experiencing dire circumstances with steeply declining numbers, while those to the east of this dividing line are more secure with relatively unchanged population sizes. The reasons for these differences are not known.

The western bumble bee (*Bombus occidentalis*) has 94 collection records for the western bumble bee on 11 national forests in Region 5 (Hatfield 2012). *B. occidentalis* was recently documented on the Eagle Lake Ranger District of the Lassen National Forest.

Habitat Status

Bumble bees are threatened by many kinds of habitat alterations that may fragment or reduce the availability of flowers that produce the nectar and pollen they require and decrease the number of abandoned rodent burrows that provide nest and hibernation sites for queens. Major threats that alter landscapes and habitat required by bumble bees include agricultural and urban development. Exposure to organophosphate, carbamate, pyrethroid, and particularly neonicotinoid insecticides has recently been identified as a major contributor to the decline of many pollinating bees, including honey bees and bumble bees (Hopwood et al. 2012). In the absence of fire, native conifers encroach upon meadows and this can also decrease foraging and nesting habitat available for bumble bees.

Heavy grazing and high forage utilization should be avoided since flowering plants providing necessary nectar and pollen may become unavailable, particularly during the spring and summer when queens, workers, and males are all present and active.

The following account of bumble bee life history is summarized from Heinrich (1979). Queens overwinter in the ground in abandoned rodent (i.e., mouse, chipmunk or vole) burrows at depths from 6 to 18 inches and typically emerge about mid-March. The queen then lays fertilized eggs and nurtures a new generation. She first creates a thimble-sized and shaped wax honey pot, which she provisions with nectar-moistened pollen for 8 to 10 individual first-generation workers when they hatch. The larvae will receive all of the proteins, fats, vitamins, and minerals necessary for growth and normal development from pollen. Eventually, all the larvae will spin a silk cocoon and pupate in the honey pot. The workers that emerge will begin foraging and provisioning new honey pots as they are created to accommodate additional recruits to the colony. Individuals emerging from fertilized eggs will become workers that reach peak abundance during July and August. Foraging individuals are largely absent by the end of September. Those that emerge from unfertilized eggs become males, which do not forage and only serve the function of reproducing with newly emerged queens. During the season, a range of 50 to hundreds of individuals may be produced depending on the quantity and quality of flowers available. When the colony no longer produces workers, the old queen will eventually die and newly emerged queens will mate with males and then disperse to create new colonies. During this extended flight that may last for up to two weeks, she may make several stops to examine the ground for a suitable burrow.

Queens end the year by locating a sheltering burrow, where they may spend the winter months under cover. Where nesting habitat is scarce, bumble bee species having queens that emerge early (mid-March) in the season like *B. vosnesenskii*, which co-occurs with the later-emerging western bumble bee, may be able to monopolize available nest sites and reduce the chances of success for bumble bee species emerging later.

Western bumble bees have a short proboscis or tongue length relative to other co-occurring bumble bee species, which restricts nectar gathering to flowers with short corolla lengths and limits the variety of flower species it can exploit. Western bumble bees have been observed taking nectar from a variety of flowering plants, including *Aster* spp., *Brassica* spp., *Centaurea* spp., *Cimicifuga arizonica, Corydalis caseana, Chrysothamnus* spp., *Cirsium* spp., *Cosmos* spp., *Dahlia* spp., *Delphinium nuttallianum, Erica carnea, Erythronium grandiflorum, Foeniculum* spp., *Gaultheria shallon, Geranium* spp., *Gladiolus* spp., *Grindelia* spp., *Haplopappus* spp., *Hedysarum alpinum, Hypochoeris* spp., *Ipomopsis aggregata, Lathyrus* spp., *Linaria vulgaris, Lotus* spp., *Lupinus monticola, Mentha* spp., *Medicago* spp., *Melilotus* spp., *Mertensia ciliata, Monardella* spp., *Nama* spp., *Origanum* spp., *Orthocarpus* spp., *Pedicularis capitata, P. kanei,* and *P. langsdorfii, P. groenlandica, Penstemon procerus, Phacelia* spp., *Prunus* spp., *Raphanus* spp., *Rhododendron* spp., *Salix* spp., *Salvia* spp., *Solidago* spp., *Symphoricarpos* spp., *Tanacetum* spp., *Taraxacum* spp., *Trifolium dasyphyllum, Trichostema* spp., *Trifolium* spp. and *Zea* spp. (Evans et al. 2008).

Direct and Indirect Effects

Bumble bees require habitats with rich supplies of floral resources with continuous blooming from spring to autumn. Isolated patches of habitat are not sufficient to fully support bumble bee populations. Bumblebee colonies are annual. In the late winter or early spring, the queen emerges from hibernation and then selects a nest site, which is often a pre-existing hole, such as an abandoned rodent hole. Although little is known about queen habitat preferences for hibernation sites, extrapolations are made from the limited knowledge available for a few bumble bee species (R. Thorp, pers. comm.): Generally, observations suggest most Northern Hemisphere species prefer well-drained slopes facing north, which may prevent them from emerging too early. The only published record of a hibernaculum of *B. occidentalis* was based on an observation in a mating and hibernation cage. In this instance, the female dug 2 inches into sandy soil of a steep west-facing slope. The most detailed published observations for hibernating bumble bees came from studies conducted in southern England. Two of the species are closely related to *B. occidentalis* and may serve as examples of what might be expected in *B. occidentalis*. Those two species showed a preference for digging the hibernaculum just below the litter and soil interface, and most were under trees rather than on exposed slopes.

Habitat loss and fragmentation may be playing a role in the decline of these bumble bee species. Habitat alterations that destroy, fragment, degrade, or reduce their food supplies, nest sites (e.g., abandoned rodent burrows or undisturbed grass), and hibernation sites for overwintering queens can harm these species (Evans et al. 2008). The minimum cross-country snow depth of 12 inches under all alternatives 2, 3, and 5 is expected to be adequate to protect vegetation from measurable impacts (McNamara 2016). Under alternatives 1 and 4, the minimum cross-country snow depth would be that depth necessary to avoid resource damage.

Cumulative Effects

None; the Lassen National Forest Over-snow Vehicle Use Designation Project would not result in measurable direct or indirect impacts to the western bumble bee and, therefore, there would be no cumulative impacts to this species.

Determination Statement

None of the alternatives of the Lassen National Forest Over-snow Vehicle Use Designation Project would impact western bumble bee or its habitat in the project area based on the following rationale:

- Colonies are annual outside of the OSV season.

- Queens of the species hibernate during the OSV season of use and, therefore, proposed actions would not result in noise impacts or impacts to foraging or breeding.
- Known information suggests that queens burrow under duff under trees and on steeper slopes where OSV use does not occur (refer to OSV use assumptions).
- OSV use is not expected to degrade terrestrial habitat based upon a minimum cross-country snow depth requirements under all of the alternatives.

Summary of Determinations

Table 171 provides a summary of effects and impacts determinations for species addressed in this analysis.

Table 171. Summary of effect or impact determinations[33] by alternative

Species Name	Status[34]	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Giant garter snake (*Thamnophis gigas*)		NE	NE	NE	NE	NE
Sierra Nevada red fox (*Vulpes vulpes necator*)	FC/FSS	MII	MII	MII	MII	MII
Gray wolf (*Canis lupus*)	FE	NLAA	NLAA	NLAA	NLAA	NLAA
California wolverine (*Gulo gulo luteus*)	FP/FSS	NJ	NJ	NJ	NJ	NJ
Northern spotted owl (*Strix occidentalis caurina*)	FT	NLAA	NLAA	NLAA	NLAA	NLAA-B
Northern spotted owl Designated critical habitat	--	NE	NE	NE	NE	NE
Valley elderberry long-horned beetle (*Desmocerus californicus dimorphus*)	FT	NE	NE	NE	NE	NE
Valley elderberry long-horned beetle Designated critical habitat	--	NE	NE	NE	NE	NE
Yellow-billed cuckoo (*Coccyzus americanus*)	FT	NE	NE	NE	NE	NE
Yellow-billed cuckoo Proposed critical habitat	--	NE	NE	NE	NE	NE
Fisher (*Pekania pennanti*)	FSS	MII	MII	MII	MII	MII
Pacific marten	FSS	MII	MII	MII	MII	MII

[33] NE=No Effect; NLAA=May affect, not likely to adversely affect; NLAA-B= May affect, not likely to adversely affect, Beneficial effect; NJ=Will not jeopardize; MII=May impact individuals, but not likely to lead to a loss of viability or a trend toward Federal listing; NI=No Impact

[34] FE = federally endangered; FT = federally listed as threatened; FP = Federal proposed for listing; FC = Federal candidate for listing; FSS = Forest Service sensitive

Species Name	Status[34]	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
(*Martes caurina*)						
Fringed myotis (*Myotis thysanodes*)	FSS	MII	MII	MII	MII	MII
Pallid bat (*Antrozous pallidus*)	FSS	MII	MII	MII	MII	MII
Townsend's big-eared bat (*Corynorhinus townsendii*)	FSS	MII	MII	MII	MII	MII
Bald eagle (*Haliaeetus leucocephalus*)	FSS	MII	MII	MII	MII	MII
California spotted owl (*Strix occidentalis occidentalis*)	FSS	MII	MII	MII	MII	MII
Great gray owl (*Strix nebulosa*)	FSS	MII	MII	MII	MII	MII
Greater Sandhill crane (*Grus Canadensis tabida*)	FSS	NI	NI	NI	NI	NI
Northern goshawk (*Accipiter gentilis*)	FSS	MII	MII	MII	MII	MII
Willow flycatcher (*Empidonax traillii*)	FSS	NI	NI	NI	NI	NI
Yellow rail (*Coturnicops noveboracensis*)	FSS	NI	NI	NI	NI	NI
Shasta Hesperian snail (*Vespericola shasta*)	FSS	NI	NI	NI	NI	NI
Western bumble bee (*Bombus occidentalis*)	FSS	NI	NI	NI	NI	NI

Migratory Birds

Migratory Landbird Conservation on the Lassen National Forest

Introduction

Under the National Forest Management Act (NFMA), the Forest Service is directed to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." (P.L. 94-588, Sec 6 (g) (3) (B)). The January 2000 USDA Forest Service (FS) Landbird Conservation Strategic Plan, followed by Executive Order 13186 in 2001, in addition to the Partners in Flight (PIF) specific habitat Conservation Plans for birds and the January 2004 PIF North American Landbird Conservation Plan all reference goals and objectives for integrating bird conservation into forest management and planning.

In late 2008, a *Memorandum of Understanding between the USDA Forest Service and the US Fish and Wildlife Service to Promote the Conservation of Migratory Birds* was signed. This MOU was

extended to December 31, 2017. The intent of the MOU is to strengthen migratory bird conservation through enhanced collaboration and cooperation between the Forest Service and the Fish and Wildlife Service as well as other Federal, State, Tribal and local governments. Within the national forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

The Lassen National Forest is proposing to manage lands on the Lassen National Forest. Proposed management is intended to implement direction contained within the Lassen National Forest Land and Resource Management Plan (LRMP, USDA Forest Service 1992). Opportunities to promote conservation of migratory birds and their habitats in the project area were considered during development and design of the Lassen National Forest Over-snow Vehicle Use Designation project (Lassen OSV project) (MOU Section C: items 1 and 11 and Section D: item 3).

Consistency with the MOU

Potential impacts to migratory species' habitats would be minimized because none of the alternatives propose to alter vegetation structure. Migratory birds of conservation concern (BOCC) have been identified regionally by the Fish and Wildlife Service (USDI Fish and Wildlife Service 2008). Table 172 lists a total of 28 BOCC species applicable to portions of Bird Conservation Regions 9 and 15 that encompass the Lassen National Forest. Of these, 24 species known to occur or potentially occur within the project area were reviewed for potential disturbance impacts (table 172). Disturbance of breeding birds due to OSV use is avoided for 12 species due to the lack of temporal overlap between season of OSV trail grooming (December 26 through March 31), general OSV use period (generally December through March or mid-April), and the breeding season. Overlap of OSV use and breeding season may occur during the OSV use period for eight species (burrowing owl, loggerhead shrike, Nuttall's woodpecker, oak titmouse, short-eared owl, eared grebe, western grebe, and Swainson's hawk); however, these species are most likely to occur at lower elevations less capable of providing snow levels that support OSV use late in the season. Temporal overlap of OSV use and eared grebe and western grebe nesting season may also occur, but because the species depends on ice-free lakes, ponds, and marshes with emergent vegetation for nesting, the species is unlikely to breed in or near areas concurrently suitable for OSV use.

Breeding season could overlap spatially and temporally with four remaining BOCC species (bald eagle, California spotted owl, white-headed woodpecker, and peregrine falcon). While peregrine falcons may utilize portions of the Lassen National Forest for foraging, there are currently no known peregrine falcon nesting areas on the Lassen National Forest. Therefore, the potential for breeding disturbance due to OSV use is currently low.

Bald Eagle

Bald eagle nest sites do occur on the Lassen National Forest, and breeding activity may begin in February. Potential impacts to bald eagles were analyzed in the Lassen OSV Project Biological Evaluation. National Bald Eagle Management Guidelines (USDI Fish and Wildlife Service 2007) include a buffer of 100 meters (330 feet) for off-road vehicle use, including snowmobiles, in forested landscapes and/or variable terrain, and 200 meters (660 feet) in open landscapes where line of sight to nest trees may be a concern. No existing or proposed groomed or non-groomed designated trails, or plowed parking areas are located within 660 feet of known bald eagle nest sites, under any alternative. Designated area or cross-country OSV travel may occur within buffered areas, with potential for OSV access in buffers (due to terrain and vegetation density) estimated to range from 11 percent under alternative 5 to over 60 percent under alternatives 1 and 4 (see the Biological

Evaluation in the project record for more information). However, no bald eagle nest sites are within 660 feet of high or moderate OSV use areas under all alternatives and, therefore, no disturbance impacts to breeding bald eagles are expected under any of the alternatives.

In addition, mitigations to address the minimization criteria applicable to all action alternatives require the Forest to use the results of ongoing inventory and monitoring of bald eagle nest sites to determine whether or not disturbance is occurring and if changes in management (i.e., mitigation according to forest plan direction) are necessary.

California Spotted Owl

The Forest Service considers activities greater than 0.25 mile (400 meters) from a spotted owl nest site to have little potential to affect nesting spotted owls. Snowmobiles passing within 0.25 mile of unsurveyed nesting/roosting habitat or an active nest have the potential to disturb nesting spotted owls. Under all alternatives, groomed and non-groomed trails and staging areas occur within 0.25 mile of California spotted activity centers and/or important habitat. However, OSV use is not consistent across all available habitat. Although we don't know specifically where impacts would occur at any given time and we cannot quantify the amount of impact, we know the potential for impacts would be greatest in areas of high OSV use. Flatter areas with slopes less than 21 percent and canopy cover less than 70 percent, including the trails and staging areas, themselves, are used more by OSVs than others and, therefore, likely to receive the highest use.

Behavioral responses to disturbance, such as leaving an area, can be readily observed in spotted owls (Tempel and Gutierrez 2003) and sensitivity in adult male spotted owls in response to acute traffic exposure was highest in May (Hayward et al. 2011). A total of 120,312 acres of buffered California spotted owl activity sites and 330,312 acres of important habitat occurs within the analysis area. The intensity and duration of noise-generating activities tested by Hayward et al. (2011) are not expected to occur as a result of the proposed action because the maximum period of interaction between OSVs, and related activities occurs prior to May, when breeding adult males are most sensitive to noise, and noise associated with snowmobile use and associated activities in the action area is expected to be of short duration (amount of time it would take to travel through any one given area) and of intermittent intensity (amount of concentrated noise).

In addition, monitoring of PACs by Lassen National Forest found no apparent relationship between a PAC's distance from a snow park and whether it was recently occupied (California OSV Program Final EIR (2010)). Based on the overlap with the breeding seasons for both northern goshawk and California spotted owl, it was recommended that snow grooming activities not be allowed to extend beyond the forest order expiration date of March 31, and under the existing condition, it does not.

Mitigations to address the minimization criteria applicable to all action alternatives require the Forest to use the results of ongoing inventory and monitoring of California spotted owl nest sites to determine whether or not disturbance is occurring and if changes in management (i.e., mitigation according to forest plan direction) are necessary.

White-headed Woodpecker

Some overlap between white-headed woodpecker breeding and OSV use may occur within the project area. However, there is no evidence that white-headed woodpeckers are susceptible enough to human disturbance to warrant seasonal restrictions except in the immediate vicinity of active nests. Nests of the birds have been observed along well-traveled roads, in campgrounds, and in housing developments (Mellen-McLean et al. 2013). If OSV use occurs near an active nest, it is likely of short duration and is not expected to impact species breeding.

Determination

The Lassen National Forest Over-snow Vehicle Use Designation project includes design features that minimize potential impacts to migratory birds, and is consistent with the Forest Service-Fish and Wildlife Service 2008 Migratory Bird Memorandum of Understanding.

Table 172. Fish and Wildlife Service Migratory Birds of Conservation Concern (USDI Fish and Wildlife Service 2008)

Species	Season [35]	Habitat	Breeding Period[1]	Potential for Occurrence Within Project Area
Bald Eagle *Haliaeetus leucocephalus*	YR	Conifer forest near large water bodies	February – July (a)	Known to occur
Black Rosy-finch *Leucosticte atrata*	YR	Alpine tundra	Early June – August (b)	Unlikely. Habitat lacking
Brewer's Sparrow *Spizella breweri*	B	Sagebrush	May – August (a)	Potential for occurrence
Burrowing Owl *Athene cunicularia*	YR	Lower elevation valleys and grasslands	March – August (a)	Potential occurrence at lowest elevations
California Spotted Owl *Strix occidentalis*	YR	Mature conifer forest	March - June (a)	Known occurrence
Calliope Hummingbird *Stellula calliope*	B	Montane and riparian forest	Early May – Early August (1)	Potential occurrence
Eared Grebe *Podiceps nigricollis*	B	Ponds, lakes, marshes with emergent vegetation	Late March – July (a)	Potential occurrence
Flammulated Owl *Otus flammeolus*	B	Mature open yellow pine forest	May - October	Known occurrence
Fox Sparrow *Passerella iliaca*	YR	Chaparral	Mid May - Early August (a)	Potential occurrence
Greater sage-grouse *Centrocercus urophasianus*	YR	Sagebrush	Mid-February - Late August (c)	Not known to occur on the Lassen NF
Green-tailed Towhee *Pipilo chlorurus*	B	Montane chaparral, sagebrush	May – Early September (a)	Potential occurrence
Lewis's Woodpecker *Melanerpes lewis*	W	Open hardwood or conifer	Early May – July (a)	Potential occurrence at lower elevations in winter
Loggerhead Shrike *Lanius ludovicianus*	YR	Shrubland or open woodland	March – August (a)	Potential occurrence at lowest elevations
Long-billed curlew *Numenius americanus*	B	Marshes, estuaries, wet meadows	Mid-April – September (a)	Potential occurrence

[35] YR=Year round; B=Breeding only; W= Winter presence only

Species	Season [35]	Habitat	Breeding Period[1]	Potential for Occurrence Within Project Area
Nuttall's Woodpecker *Picoides nuttallii*	YR	Low elevation riparian hardwood	Late March - Early July (a)	Potential occurrence at lowest elevations
Oak Titmouse *Baeolophus inornatus*	YR	Oak-dominated woodlands	March – July (a)	Potential occurrence at lower elevations in winter
Olive-sided Flycatcher *Contopus cooperI*	B	Montane conifer with openings	Early May – August (a)	Potential occurrence
Peregrine Falcon *Falco peregrinus*	YR	High cliffs near open habitat or water	Early March – August (a)	Potential occurrence, but no known nest sites.
Pinyon Jay *Gymnorhinus cyanocephalus*	YR	Pinyon-juniper woodland	February – October (a)	Unlikely due to minor amount of habitat
Sage thrasher *Oreoscoptes montanus*	B	Sagebrush	Early April – Mid-August (a)	Potential occurrence
Short-eared Owl *Asio flammeus*	W	Large open grasslands and marshes	Early March – July (a)	Winters in areas where snow cover is scant or absent
Snowy Plover *Charadrius alexandrinus*	B	Sparsely vegetated areas	April – August (a)	Not known to occur on the Lassen NF
Swainson's Hawk *Buteo swainsoni*	B	Open grasslands and sparse shrublands	Late March - Late August (a)	Potential occurrence at lower elevations
Tri-colored blackbird *Agelaius tricolor*	B	Emergent wetlands	Mid-April - Late July (a)	Potential occurrence at lowest elevations
Western Grebe *Aechmophorus occidentalis*	YR	Lakes	April – August (a)	May occur in winter at lowest elevations with ice-free lakes
White Headed Woodpecker *Picoides albolarvatus*	YR	Mature pine with large snags	Mid-April - Late August (a)	Known occurrence
Williamson's Sapsucker *Sphyrapicus thyroideus*	YR	Montane conifer, mixed conifer-hardwood	May – July (d)	Potential occurrence
Willow Flycatcher *Empidonax traillii*	B	Wet meadow and montane riparian	May – August (a)	Known occurrence

1 References used for breeding seasons:

CDFW 2017

Johnson 2002

Shuford and Gardali 2008

Gyug et al. 2012

Management Indicator Wildlife Species

The purpose of this section is to evaluate and disclose the impacts of the Lassen National Forest Over-snow Vehicle Designation Project (Lassen OSV Project) on the habitat of the 13 management indicator species (MIS) identified in the Lassen National Forest LRMP (USDA 1992) as amended by the Sierra Nevada Forests Management Indicator Species Amendment (SNF MIS Amendment) Record of Decision (USDA Forest Service 2007a). This section documents the effects of the proposed action and alternatives on the habitat of selected project-level MIS. Detailed descriptions of the Lassen OSV Project alternatives are found in the chapter 2 of this RFEIS.

MIS are animal species identified in the SNF MIS Amendment Record of Decision (ROD) signed December 14, 2007, which was developed under the 1982 NFS Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR Part 219). Guidance regarding MIS set forth in the 1992 LRMP as amended by the 2007 SNF MIS Amendment ROD directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitat of each MIS affected by such projects, and (2) at the bioregional scale, monitor populations and/or habitat trends of MIS, as identified in the 1992 LRMP as amended.

Direction Regarding the Analysis of Project-level Effects on MIS Habitat

Project-level effects on MIS habitat are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects would change the habitat in the analysis area.

These project-level impacts to habitat are then related to broader scale (bioregional) population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the type of monitoring identified for MIS in the LRMP as amended by the SNF MIS Amendment ROD. Hence, where the Lassen National Forest LRMP as amended by the SNF MIS Amendment ROD identifies distribution population monitoring for an MIS, the project-level habitat effects analysis for that MIS is informed by available distribution population monitoring data, which are gathered at the bioregional scale.

Adequately analyzing project effects to MIS generally involves the following steps:

- Identifying which habitat and associated MIS would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.
- Summarizing the bioregional-level monitoring identified in the LRMP, as amended, for this subset of MIS.
- Analyzing project-level effects on MIS habitat for this subset of MIS.
- Discussing bioregional scale habitat and/or population trends for this subset of MIS.
- Relating project-level impacts on MIS habitat to habitat and/or population trends at the bioregional scale for this subset of MIS.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination" (May 25, 2006) (USDA Forest Service 2006a). This MIS Report documents application of the above steps to select project-level MIS and analyze project effects on MIS habitat for the Lassen OSV Project.

Direction Regarding Monitoring of MIS Population and Habitat Trends at the Bioregional Scale

The bioregional scale monitoring strategy for the Lassen National Forest's MIS is found in the 2007 SNF MIS Amendment ROD (USDA Forest Service 2007a). Bioregional scale habitat monitoring is identified for all 12 of the terrestrial MIS. In addition, bioregional scale population monitoring, in the form of distribution population monitoring, is identified for all of the terrestrial MIS except for the greater sage-grouse. For aquatic macroinvertebrates, the bioregional scale monitoring identified is Index of Biological Integrity and Habitat. The current bioregional status and trend of populations and/or habitat for each of the MIS is discussed in the 2010 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report (USDA Forest Service 2010a).

MIS Habitat Status and Trend

All habitat monitoring data are collected and/or compiled at the bioregional scale, consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA Forest Service 2007a).

Habitats are the vegetation types (for example, early seral coniferous forest) or ecosystem components (for example, snags in green forest) required by an MIS for breeding, cover, and/or feeding. MIS for the Sierra Nevada National Forests represent 10 major habitats and 2 ecosystem components (USDA Forest Service 2007a), as listed in table 172. These habitats are defined using the California Wildlife Habitat Relationship (CWHR) System (CDFG 2005). The CWHR System provides the most widely used habitat relationship models for California's terrestrial vertebrate species (ibid). It is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Habitat status is the current amount of habitat on the Sierra Nevada forests. Habitat trend is the direction of change in the amount or quality of habitat over time. The methodology for assessing habitat status and trend is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

MIS Population Status and Trend

All population monitoring data are collected and/or compiled at the bioregional scale, consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA Forest Service 2007a). The information is presented in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Population monitoring strategies for MIS of the Lassen National Forest are identified in the 2007 SNF MIS Amendment ROD (USDA Forest Service 2007a). Population status is the current condition of the MIS related to the population monitoring data required in the 2007 SNF MIS Amendment ROD for that MIS. Population trend is the direction of change in that population measure over time.

There are a myriad of approaches for monitoring populations of MIS, from simply detecting presence to detailed tracking of population structure (USDA Forest Service 2001, Appendix E, page E-19). A distribution population monitoring approach is identified for all of the terrestrial MIS in the 2007 SNF MIS Amendment, except for the greater sage-grouse (USDA Forest Service 2007a). Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time. Presence data are collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. The specifics regarding how these presence

data are assessed to track changes in distribution over time vary by species and the type of presence data collected, as described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Aquatic Macroinvertebrate Status and Trend

For aquatic macroinvertebrates, condition and trend is determined by analyzing macroinvertebrate data using the predictive, multivariate River Invertebrate Prediction And Classification System (RIVPACS) (Hawkins 2003) to determine whether the macroinvertebrate community has been impaired relative to reference condition within perennial water bodies. This monitoring consists of collecting aquatic macroinvertebrates and measuring stream habitat features according to the Stream Condition Inventory (SCI) manual (Frazier et al. 2005). Evaluation of the condition of the biological community is based upon the "observed to expected" (O/E) ratio, which is a reflection of the number of species observed at a site versus the number expected to occur there in the absence of impairment. Sites with a low O/E scores have lost many species predicted to occur there, which is an indication that the site has a lower than expected richness of sensitive species and is therefore impaired.

Selection of Project-level MIS

MIS for the Lassen National Forest are identified in the 2007 SNF MIS Amendment ROD (USDA Forest Service 2007a). The habitats and ecosystem components and associated MIS analyzed for the project were selected from this list of MIS (table 173). In addition to identifying the habitat or ecosystem components (1st column), the CWHR type(s) defining each habitat/ecosystem component (2nd column), and the associated MIS (3rd column), the table discloses whether or not the habitat of the MIS is potentially affected by the Lassen OSV Project (4th column).

Conclusion

For all alternatives, elements contained in the alternatives pertaining to OSV management and use would not alter MIS habitat structural components, and would not directly or indirectly affect existing amounts of MIS habitats on the Lassen National Forest. Therefore, no MIS species will be carried forward for further analysis.

Table 173. Selection of MIS for project-level habitat analysis for the Lassen OSV Project

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component[1]	Sierra Nevada Forests MIS *Scientific Name*	Category for Project Analysis [2]
Riverine & Lacustrine	lacustrine (LAC) and riverine (RIV)	aquatic macroinvertebrates	2
Shrubland (west-slope chaparral types)	montane chaparral (MCP), mixed chaparral (MCH), chamise-redshank chaparral (CRC)	fox sparrow *Passerella iliaca*	2
Sagebrush	Sagebrush (SGB)	greater sage-grouse *Centrocercus urophasianus*	2
Oak-associated Hardwood & Hardwood/conifer	montane hardwood (MHW), montane hardwood-conifer (MHC)	mule deer *Odocoileus hemionus*	2
Riparian	montane riparian (MRI), valley foothill riparian (VRI)	yellow warbler *Dendroica petechia*	2
Wet Meadow	Wet meadow (WTM), freshwater emergent wetland (FEW)	Pacific tree (chorus) frog *Pseudacris regilla*	2

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component[1]	Sierra Nevada Forests MIS *Scientific Name*	Category for Project Analysis [2]
Early Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree sizes 1, 2, and 3, all canopy closures	Mountain quail *Oreortyx pictus*	2
Mid Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 4, all canopy closures	Mountain quail *Oreortyx pictus*	2
Late Seral Open Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 5, canopy closures S and P	Sooty (blue) grouse *Dendragapus obscurus*	2
Late Seral Closed Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree size 5 (canopy closures M and D), and tree size 6.	California spotted owl *Strix occidentalis occidentalis*	2
		American marten *Martes americana*	
		northern flying squirrel *Glaucomys sabrinus*	
Snags in Green Forest	Medium and large snags in green forest	hairy woodpecker *Picoides villosus*	2
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	black-backed woodpecker *Picoides arcticus*	2

[1] All CWHR size classes and canopy closures are included unless otherwise specified; **dbh** = diameter at breast height; **Canopy Closure classifications:** S=Sparse Cover (10-24% canopy closure); P= Open cover (25-39% canopy closure); M= Moderate cover (40-59% canopy closure); D= Dense cover (60-100% canopy closure); **Tree size classes:** 1 (Seedling)(<1" dbh); 2 (Sapling)(1"-5.9" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(≥24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).

[2] **Category 1:** MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.

Category 2: MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.

Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

Survey and Manage Wildlife Species

Forestwide standards and guidelines for "Survey and Manage" old-growth associated species were revised in January 2001, and described in the 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures, Standards and Guidelines (2001 ROD) (USDA Forest Service and USDI BLM 2001). Category A and C species that are considered to be within the California Klamath Province require pre-disturbance field survey prior to implementing management actions that could significantly, negatively affect the species' habitat or persistence of the species on the site. Pre-disturbance surveys are not required if delay in implementation of a proposed action to perform surveys would result in an unacceptable environmental risk. The adopted standards and guidelines for Survey and Manage species only applies within the area of the Northwest Forest Plan (NWFP), which, on the Lassen National Forest, encompasses approximately 41,893 acres in the northwestern portion of the Hat Creek Ranger District. This analysis addresses potential effects of the Lassen Over-snow Use Designation Project on Survey and Manage vertebrates, mollusks, and arthropods. Fungi, lichens, bryophytes, and vascular plants are addressed in the project botany report (project record).

Survey and Manage Standards and Guidelines germane to this project are as follows:

1. Manage for known sites of Survey and Manage species in Categories A, B, or E and high-priority sites of Category C or D species.

2. Complete pre-disturbance surveys for Category A and C species if activity is potentially habitat disturbing such that it is likely to have a significant negative impact on the species' habitat, life cycles, microclimate, or life support requirements (USDA Forest Service and USDI BLM 2001).

Assessment Process

1. Consideration of species category, range, habitat, and current scientific information

Considerations that would preclude further analysis of survey and manage species for this project are as follows:

a) Species assigned to Category F, a category, which does not require management of known sites or pre-disturbance surveys.

b) Species assigned to Categories B, D, or E, categories requiring management of known sites where no known sites are documented in this project area.

c) Species assigned to Categories A or C, categories requiring pre-disturbance surveys (if habitat-disturbing activities are suspected) but these species' habitats do not correspond to the project area.

d) Species assigned to Categories A or C, but the ranges of these species do not coincide with the project area or Lassen National Forest.[36]

e) Current scientific information such as taxonomic uncertainty or taxonomic changes.

2. The following steps were conducted to determine which species would be carried forward in the analysis and which of the aforementioned activities are considered habitat disturbance.

a) Query of the National Resources Information System (NRIS) database and California Natural Diversity Database (CNDDB) to determine if known sites exist in the project area.

b) Determination of which activities may compromise the persistence of a species at a site based upon the focal species' habitat, life cycle, microclimate or life support requirements.

c) Assessment of the level of management for known sites to assure persistence at a site and the portion of the project area warranting pre-disturbance surveys, based upon the potential for habitat disturbing activities.

[36] Based on information in USDA Forest Service and USDI Bureau of Land Management (2001), Bureau of Land Management (1999), and NatureServe (2014).

Survey and Manage Species Analysis

Affected Environment

Existing Condition

Manage Known Sites Requirement

The 2001 ROD requires management of known sites of any Category A, B, or E species and high-priority sites of Category C or D species. High-priority sites are those that are needed to provide for reasonable assurance of species persistence. No high-priority sites are located on the Lassen National Forest.

Category A, C, and E species

Currently, only one species requiring pre-disturbance surveys, if habitat-disturbing activities are suspected, has suitable habitat within the Lassen National Forest (table 174). According to NRIS, CNDDB, and forest staff, there are no verified sightings of great gray owl on the Lassen National Forest.

Table 174. Survey and manage terrestrial wildlife species, categories A, C, and E

Common Name ***Scientific Name***	**Habitat**	**Known sites within NWFP portion of project?**	**Potential habitat present?**
Great gray owl *Strix nebulosa* Category A	Mid- or late-succession conifer forests at size class 4 (dominant and co-dominant trees 12 to 23 inches), containing large (over 24 inches dbh), broken-top snags. No known sites in NWFP area. Also a Region 5 Sensitive species[37].	No	Yes

The 2001 ROD requires specific mitigations for the great gray owl, within the range of the northern spotted: provide a no-harvest buffer of 300 feet around meadows and natural openings and establish 0.25-mile protection zones around known nest sites.

Category B species

The 2001 ROD provides direction to perform equivalent effort (project level) field surveys for all Category B Survey and Manage species. There are no category B terrestrial wildlife species within the Lassen National Forest.

Environmental Consequences

Mitigations to Address Minimization Criteria of the Travel Management Regulations

In designating NFS trails and areas on a national forest, the Forest Service Travel Management Regulations require the responsible official to "consider effects on the following, with the objective of minimizing:

- Damage to soil, watershed, vegetation, and other forest resources;
- Harassment of wildlife and significant disruption of wildlife habitats;

[37] Assessed in the project Biological Evaluation

- Conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands; and
- Conflicts among different classes of motor vehicle uses of National Forest System lands or neighboring Federal lands" (36 CFR §212.55(b)).

The mitigations that address the minimization criteria are in appendices C and D of this RFEIS (Volume II) and the Wildlife Biological Evaluation (see project record).

Effects Common to All Alternatives

None of the alternatives under consideration as part of the Lassen Over-snow Vehicle Designation project would physically modify structure or composition of great gray owl habitat and, therefore, the mitigations[38] in the 2001 ROD for the great gray owl, within the range of the northern spotted owl would not apply. In addition, OSV use and related activities are an ongoing use on the Lassen National Forest.

Although the potential for noise-based disturbance to individuals within high-reproductive habitat ranges from 32 to 37 percent under all of the alternatives, great gray owls have not been confirmed on the Lassen National Forest. In the event that great gray owls are found on the forest, the potential for OSV-related noise-based disturbance would overlap with only the early part of the March 1 through August 15 great gray owl breeding season, and nest sites with potential to be impacted would be monitored to determine whether or not disturbance is occurring and if changes in management, including a limited operating period around nest sites, are necessary, thereby minimizing impacts to great gray owl. In addition, due to their nocturnal behavior, great gray owls, if present, would be expected to have little interaction with snowmobiles or snow grooming equipment resulting in very little potential for direct effects from snowmobiles or grooming equipment.

[38] Provide a no-harvest buffer of 300 feet around meadows and natural openings and establish 1/4-mile protection zones around known nest sites.

Fisheries and Aquatic Resources

The purpose of this analysis is to determine the impacts of over-snow vehicles (OSVs) on aquatic resources in support of a court-ordered settlement for the Lassen National Forest. The focus is on impacts to aquatic species and their habitat that may result from the use of OSVs as described in the alternatives.

OSV use could impact aquatic species and their habitat through chemical contamination, ground surface disturbance, runoff timing, or through altering streamside vegetation. The Lassen National Forest adheres to a variety of laws, regulations and policy that provide guidelines and standards for managing OSV impacts. Direct, indirect, and cumulative effects of OSV use on aquatic species and their habitat from implementation of this plan, and specific actions identified in the alternatives, will be analyzed.

This analysis will describe the area affected by the alternatives and existing resource conditions within watersheds where aquatic species and their habitat overlap with OSV use. Hydrology and aquatic resource measurement indicators are used to describe the existing conditions for watersheds within the analysis area and for analysis to compare, quantify, and describe how each alternative addresses resource concerns as they pertain to aquatic resources. The analysis includes all aquatic resources that could be affected by OSVs. This includes perennial and seasonal streams, lakes, ponds, meadows, and springs.

Aquatic Species Biological Evaluation/Biological Assessment

Because OSV use and snow trail grooming could affect some aquatic species and their habitat, this analysis will evaluate the direct, indirect, and cumulative effects of the alternatives on aquatics species and their habitat, including threatened, endangered, proposed or sensitive species (TEPS) that could result from the proposed actions.

The main body of this section documents the biological evaluation/biological assessment (project record) to evaluate and disclose effects of the proposed action and alternatives on Federal threatened, endangered, proposed, or candidate aquatic species, and Forest Service Region 5 sensitive species. Collectively, these aquatic species are referred to as TEPS.

Relevant Laws, Regulations, and Policy

Regulatory Framework

Land and Resource Management Plan

The Lassen National Forest Land and Resource Management Plan (LRMP, USDA Forest Service 1992) provides direction specific to management of fish, water and riparian areas, and is found as goals, objectives, and standards and guidelines in chapter 4 of the Lassen LRMP as well as in the Northwest Forest Plan (NWFP) and Sierra Nevada Forest Plan Amendment (SNFPA), both of which include aquatic conservation strategies (including a long-term strategy in the SNFPA for management of anadromous fishes on the Lassen National Forest). Aquatic conservation strategies are found in their entirety in each of the aforementioned amendments to the LRMP.

Endangered Species Act (ESA)

The Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) requires that any action authorized by a Federal agency not be likely to jeopardize the continued existence of a threatened or endangered (TE) species, or result in the destruction or adverse modification of critical habitat for these species.

Section 7 of the ESA, as amended, requires the responsible Federal agency to consult the Fish and Wildlife Service and the National Marine Fisheries Service concerning TE species under their jurisdiction. It is Forest Service policy to analyze impacts to TE species to ensure management activities are not be likely to jeopardize the continued existence of a TE species, or result in the destruction or adverse modification of critical habitat for these species. This assessment is documented in a biological assessment (project record).

Magnuson–Stevens Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. The MSA requires Federal agencies to consult with the National Marine Fisheries Service on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (MSA '305(b)(2)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA '3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species = contribution to a healthy ecosystem; and spawning, breeding, feeding, or growth to maturity covers a species' full life cycle (50 CFR §600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR §600.810).

EFH for the Pacific coast salmon fishery means those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. To achieve that level of production, EFH must include all those streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. In the estuarine and marine areas, salmon EFH extends from the near shore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 kilometers (230 miles)) offshore of Washington, Oregon, and California north of Point Conception Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the Pacific Fishery Management Council),and longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for several hundred years).

Essential fish habitat determinations are either “May Adversely Affect” (MAA) or “Not Adversely Affect (NAA). EFH is the same area as designated critical habitat (DCH) for species discussed in this aquatics analysis and is used interchangeably in the analysis.

Forest Service Manual and Handbooks (FSM/H 2670)

Forest Service sensitive species are species identified by the Regional Forester for which population viability is a concern. The Forest Service develops and implements management practices to ensure that rare plants and animals do not become threatened or endangered and ensure their continued viability on national forests. It is Forest Service policy to analyze impacts to sensitive species to

ensure management activities do not create a significant trend toward Federal listing or loss of viability. This assessment is documented in a biological evaluation (project record).

Forest Service Manual 2670.32 (USDA Forest Service 2005) directs the forest to avoid or minimize impacts to species whose viability has been identified as a concern, and therefore, listed as sensitive by the Regional Forester. If impacts cannot be avoided then the forest must analyze the significance of the potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. Impacts may be allowed but the decision must not result in a trend toward Federal listing.

Forest Service Manual 2670.22 (USDA Forest Service 2005) directs national forests to "maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands." To comply with this direction, forests are encouraged to track and evaluate effects to additional species that may be of concern even though they are not currently listed as sensitive. Such plant species are referred to as species of interest or watch list species.

Sierra Nevada Forest Plan Amendment (SNFPA)

The Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004) amended each of the forest plans in the Sierra Nevada and provides regional direction to restore aquatic, riparian, and meadow ecosystems and provide for the viability of native plant and animal species associated with these ecosystems. This includes mountain yellow-legged frogs, Yosemite toads, and their habitats. This regional direction is represented by an array of features that, in their entirety, constitute an aquatic management strategy for the Sierra Nevada. The fundamental principle of the aquatic management strategy is to retain, restore, and protect the processes and landforms that provide habitat for aquatic and riparian-dependent organisms. Accomplishment of these objectives are achieved through a combination of tactics such as standards and guidelines and policies that are intended to work collectively, and include a suite of interrelated actions that work together to manage and conserve aquatic habitats.

Riparian Conservation Areas (RCA): Activity-Related Standards and Guidelines

Where a proposed project encompasses an RCA or a critical aquatic refuge (CAR), conduct a site-specific project area analysis to determine the appropriate level of management within the RCA (or CAR). Determine the type and level of allowable management activities by assessing how proposed activities measure against the riparian conservation objectives (RCO) and their associated standards and guidelines. Areas included in RCAs are: 300 feet on each side of perennial streams; 150 feet on each side of intermittent and ephemeral streams; and 300 feet from lakes, meadow, bogs, fens, wetlands, vernal pools, and springs.

Topics and Issues Addressed in This Analysis

Issues

Designating trails and areas for OSV use have the potential to impact aquatic wildlife through direct, indirect, or cumulative disturbance to individuals and direct, indirect, or cumulative disturbance or impacts to aquatic wildlife habitats.

OSV use also has the potential for releasing burned and unburned fuel and lubricants into the environment. These potential impacts can then indirectly result in adverse impacts to water quality and alter snowmelt patterns.

Over-snow vehicles, when operated cross-country instead of on designated trails have the potential for more widespread impacts due to the potential for ground disturbance (similar in nature to summer motorized use if there is inadequate snow cover). These potential effects are highly dependent on location, particularly areas of thin snow cover, and the amount and timing of use. Wet meadows, springs, seeps, and fens, are particularly sensitive to disruption.

Resource Indicators and Measures

Table 175. Aquatic species resource indicators and measures for assessing effects

Resource Element	Resource Indicator	Measure (Quantify if possible)
Aquatic species	Species presence	Occurrence of TEPS species within designated OSV use areas. Occurrence of TEPS species in proximity to designated OSV trails.
	Minimum Snow Depth for OSV Use on Designated Trails	Minimum snow depths on trails can be evaluated for effectiveness for protecting the trail surface and potential for sediment delivery to waterways
Aquatic habitat	Minimum Snow Depth for Cross-country OSV Use	Minimum snow depths for cross-country travel can be evaluated for effectiveness for protecting aquatic habitats
	*Consistency with RCOs 1, 2, 4, 5, and 6 (Analyzed in the hydrology analysis)	Evaluation of the effects to RCAs, water quality and beneficial uses of water

*Note: The Sierra Nevada Forest Plan Amendment requires that riparian conservation objectives (RCO) analyses be conducted during environmental analyses for new proposed management activities within CARs and RCAs (Standard and Guideline 92). There are no additional routes proposed for addition to the national forest transportation system within CARs in the analysis area. Consequently, consistency with the RCOs is an indicator to ensure that goals of the aquatic management strategy are met (USDA FForest Service 2004: 32). The RCO Analysis is in appendix F of the hydrology analysis.

Methodology and Information Sources

This analysis uses relevant Geographic Information System (GIS) data layers from the Lassen National Forest. The GIS layers of proposed OSV designations and groomed trails were overlain with the aquatic resource (i.e., species distribution, critical habitat, surveys) layers to identify areas of potential effects.

The biological evaluation/biological assessment (project record) reviews the proposed action and alternatives in sufficient detail to determine the level of effect that would occur to federally listed aquatic and Region 5 sensitive species. One of four possible determinations is chosen based on the available literature, a thorough analysis of the potential effects of the project, and the professional judgment of the biologist who completed the evaluation. The four possible determinations (from FSM 2672.42) are:

1. “No impact” – where no impact is expected;
2. “Beneficial impact” – where impacts are expected to be beneficial;
3. “May adversely impact individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area” – where impacts are expected to be immeasurable or extremely unlikely; and
4. “May affect individuals, and is likely to result in a trend toward Federal listing or loss of viability in the planning area” – where impacts are expected to be detrimental and substantial.

Similar categories for federally listed threatened and endangered species are:

1. No effect
2. Beneficial effect
3. May affect, not likely to adversely affect
4. May affect, likely to adversely affect

Incomplete and Unavailable Information

There is little research and information available regarding the responses of each aquatic species from OSV uses, including indirect effects from snow compaction and vehicle emissions during the winter.

No field observations or site specific aquatic surveys or monitoring related to OSV use and their potential effects to aquatic species was done to support this analysis. Lassen recreation staff monitor OSV and other winter recreation use on the forest, but no water quality sampling or assessments on effects of OSV use on aquatic species have been made. Assessments of impacts of OSVs were primarily based on current scientific literature and professional judgement.

Spatial and Temporal Context for Effects Analysis

The project area boundary serves as the analysis boundary for direct, indirect, and cumulative effects. Effects to aquatic species or their habitat would be expected to have occurred or become evident within one or two years of disturbance and this constitutes the short term. Effects that linger beyond 2 years are considered long term effects. Long term effects beyond 2 years become increasingly difficult to predict due to unknown interactions and the many environmental variables with numerous possible outcomes.

Direct and Indirect Effects Boundaries

The spatial boundary for analyzing the direct and indirect effects to aquatic resources is the project area boundary, because all expected effects relevant to this resource would occur and remain within this area.

Cumulative Effects Boundaries

Because effects from the proposed activities would interact with effects from other ongoing or future projects only within the project area boundary, the cumulative effects boundary is also the project area boundary. The project area boundary is the Lassen National Forest boundary.

Assumptions specific to the aquatic resources analysis:

- Aquatic species are unlikely to be directly affected by authorized OSV use (with the specified snow depth requirements).
- Indirect effects, such as those possibly resulting from snow compaction and vehicle emissions, are likely to be concentrated along designated OSV trails (groomed or ungroomed) because OSV use is concentrated. Therefore, an area within 100 feet of designated OSV trails is reasonably foreseeable to be affected by snow compaction, emissions, or other contamination. Areas designated for OSV use away from OSV trails are much less likely to experience measurable indirect effects.
- Only authorized OSV uses will be analyzed. Concerns arising from unauthorized uses would be addressed as law enforcement issues and may prompt corrective actions.

- Future aquatic resource-related monitoring may identify unexpected types or levels of impacts to aquatic resources, and may prompt corrective actions as warranted.

Affected Environment

Existing Condition

Threatened, Endangered, and Proposed Aquatics Species

Official species lists for this project were obtained on September 29, 2015, from the Klamath Falls, Sacramento, Yreka, and Nevada Field Offices of the United States Department of the Interior, Fish and Wildlife Service (USDI Fish and Wildlife Service 2015a, b, c, and d). An updated list was obtained in September 2017 through the Fish and Wildlife Service Information for Planning and Conservation website (https://ecos.fws.gov/ipac/) from the Sacramento, Yreka and Nevada Fish and Wildlife Service office. The lists identify aquatic species to consider because they may be present within the general area of the Lassen National Forest.

The lists identify aquatic species to consider because they may be present within the general area of the Lassen National Forest:

Species Considered in the Analysis

Species or critical habitat that may occur in the action area or be affected by activities associated with the proposed action and alternatives were reviewed. The species and critical habitat in table 176 were evaluated for potential presence in the action area. Species which are not known or suspected to occur in areas that may be designated for OSV use are not carried forward into the effects analysis.

Table 176. TEPS aquatic species considered for Lassen National Forest Over-snow Vehicle Use Designation project

Species	Status	Known or Potential Occurrence in the action area	Finding/Rationale
Amphibians			
California red-legged frog (*Rana draytonii*)	Threatened	No Potential Occurrence	No Effect. No DCH on Lassen NF
Oregon spotted frog (*Rana pretiosa*)	Threatened	No Potential Occurrence	No Effect. Species is not suspected to occur on Lassen NF. Historically, in California this species ranged in extreme northeast California, where it was known from only a few scattered localities including Pine Creek, S. Fork Pitt River near Alturas, Warner Mtns., and the southwestern side of Lower Klamath Lake.
Sierra Nevada yellow-legged frog (*Rana sierrae*)	Endangered	Potential Occurrence	Historical occurrence, but no known extant populations on the Lassen NF. Currently classified under 'utilization unknown' Fish and Wildlife Service suitable habitat category, therefore presence is assumed.

Species	Status	Known or Potential Occurrence in the action area	Finding/Rationale
Fishes			
Chinook salmon (*Oncorhynchus tshawytscha*) Central Valley Spring Run ESU	Threatened	Potential Occurrence	Habitat currently located in the southwest portion within Lassen National Forest administrative boundaries.
Coho salmon (*Oncorhynchus (=salmo) kisutch*)	Threatened	No Potential Occurrence	No Effect. Species and habitat does not exist on Lassen National Forest.
Delta smelt (*Hypomesus transpacificus*)	Threatened	No Potential Occurrence	No Effect. The geographic range of the Delta smelt (USDI Fish and Wildlife Service 1993) is outside the project area.[1]
Longfin, San Francisco Bay Delta Population smelt (*Spirinchus thaleichthys*)	Candidate	No Potential Occurrence	No Effect. Species and habitat does not exist on Lassen National Forest.
Central Valley Steelhead (*Oncorhynchus (=salmo) mykiss*)	Threatened	Potential Occurrence	Habitat currently located in the southwest portion within Lassen National Forest administrative boundaries.
Aquatic Invertebrates			
Conservancy fairy shrimp (*Branchinecta conservatio*)	Endangered	No Potential Occurrence	No Effect. Forest is outside the elevational range of this species, and specific habitat (Central Valley vernal pools) does not exist within its boundaries. [2]
Shasta crayfish (*Pacifastacus fortis*)	Endangered	No Potential Occurrence	No Effect. Project area is located outside range of species. [3]
Vernal pool fairy shrimp (*Branchinecta lynchi*)	Threatened	No Potential Occurrence	No Effect. Forest is outside the elevational range of this species, and specific habitat (Central Valley vernal pools) does not exist within its boundaries.[4]
Vernal pool tadpole shrimp (*Lepidurus packardi*)	Endangered	No Potential Occurrence	No Effect. Forest is outside the elevational range of this species, and specific habitat (Central Valley vernal pools) does not exist within its boundaries. [5]
	CRITICAL	**HABITATS WITHIN**	**THE PROJECT AREA**
Species	**Status**	**Occurrence**	**Analysis**
Sierra Nevada yellow-legged frog (*Rana sierrae*)	Final Designated Critical Habitat	Known Occurrence	Yes, DCH
Chinook salmon (*Oncorhynchus tshawytscha*) Central Valley Spring Run	Final Designated	Known Occurrence	Yes. There is DCH for this species and EFHdesignated for Chinook salmon on Lassen National Forest. [6]

Species	Status	Known or Potential Occurrence in the action area	Finding/Rationale
Steelhead (*Oncorhynchus (=salmo) mykiss*)	Final Designated	Known Occurrence	Yes. There is DCH for this species on Lassen National Forest.
Forest Sensitive Species			
Species	**Status**	**Occurrence**	**Analysis**
Cascades frog *(Rana cascadae)*	Sensitive	Known Occurrence	Known presence; considered in analysis.
Black Juga *(Juga nigrina)*	Sensitive	Likely Occurrence	Present within stream located within project boundaries; considered in analysis.

[1] USDI Fish and Wildlife Service. 1993.
[2] USDI Fish and Wildlife Service. 2007a.
[3] USDA Forest Service. 2010.
[4] USDI Fish and Wildlife Service. 2007b..
[5] USDI Fish and Wildlife Service. 2007c.
[6] NOAA Fisheries, West Coast Region. Map of critical habitat, Central Valley Spring-run Chinook Salmon. http://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/salmon_steelhead/critical_habitat/chin/chinook_cvsr.pdf

Because they are not present and not suspected of occurring within areas currently or proposed for OSV use, the following species would **not** be affected and are not carried forward into the effects analysis:

Threatened or Endangered

- California red-legged frog (*Rana draytonii*)
- Oregon spotted frog (*Rana pretiosa*)
- *Sierra Nevada yellow-legged frog (*Rana sierrae*)
- Coho salmon (*Oncorhynchus kisutch*)
- Delta smelt (*Hypomesus transpacificus*)
- Longfin, San Francisco Bay Delta Population smelt (*Spirinchus thaleichthys*)

* see further explanation in the determinations section of this analysis.

Sensitive

- Foothill yellow-legged frog (*Rana boylii*)
- California floater (*Anodonta californiensis*)
- Great Basin Rams-horn (*Helisoma newberryi newberryi*)
- Scalloped Juga (*Juga (Calibasis) acutifilosa*)
- Topaz Juga (*Juga (Calibasis) occata*)
- Montane Peaclam (*Pisidium (Cyclocalyx) ultramontanum*)
- Nugget pebblesnail (*Fluminicola seminalis*)
- Kneecap lanx (*Lanx patelloides*)
- Eagle Lake rainbow trout (*Oncorhynchus mykiss aquilarum*)

- Goose Lake redband trout (*Oncorhynchus mykiss pop. 6*)
- Hardhead (*Mylopharodon conocephalus*)

Listed Species and Critical Habitat Information

Chinook salmon (Oncorhynchus tshawytscha) Central Valley Spring Run ESU and Central Valley steelhead (Oncorhynchus (=salmo) mykiss)

Affected Environment

In 1999, the National Marine Fisheries Service listed the Central Valley spring-run Chinook salmon evolutionarily significant unit (ESU) as threatened under the Federal Endangered Species Act (ESA) (64 FR 50394). The Central Valley ESU includes all naturally spawned populations in the Sacramento River, tributaries of the Sacramento River, and the Feather River (64 FR 50394). In 2005, the National Marine Fisheries Service published a final listing determination for Central Valley spring-run that added Feather River Hatchery spring-run to the designation and the final designation of critical habitat, which includes the Sacramento, lower Feather, and Yuba Rivers; and Beegum, Battle, Clear, Cottonwood, Antelope, Mill, Deer, Butte, and Big Chico Creeks (70 FR 52590).

Of five fourth-field sub-basins occupied by these two federally listed species, only two are occupied by the species within the Lassen National Forest boundary: Sacramento-Thomes-Elder-Mill (containing Mill and Antelope Creeks) and Sacramento-Deer (containing Deer Creek) (see figure 18 showing anadromous fish-producing fourth-field watersheds).

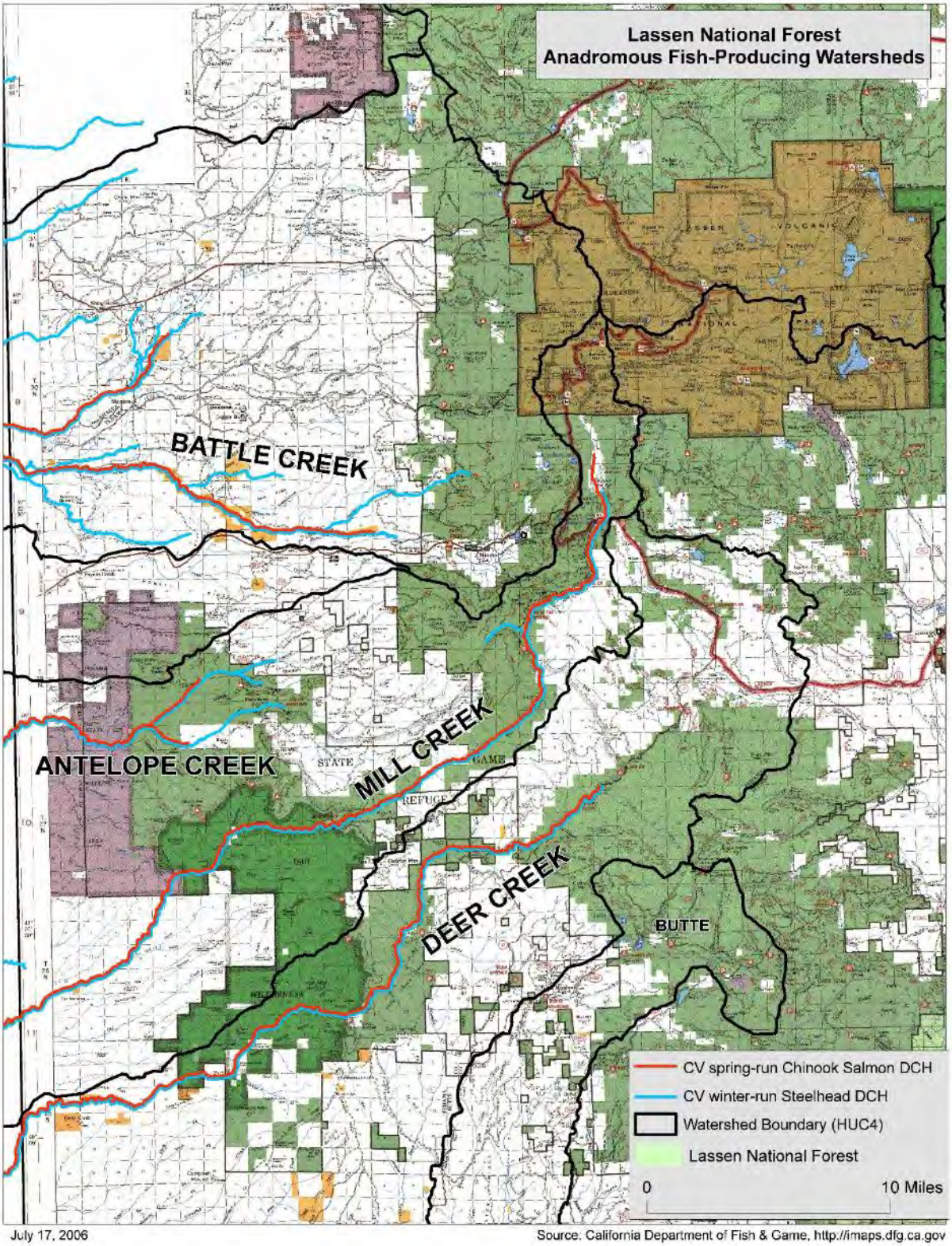

Figure 18. Anadromous fish-producing watersheds on the Lassen National Forest

The following subbasins summarized details of anadromous fish occupancy in the Lassen NF:

Antelope Creek: contains assumed occupancy based on DCH for each species.

Mill Creek: contains occupancy for both species up to 0.25 mile from the Lassen Volcanic National Park boundary on the mainstem of Mill Creek. Steelhead have an assumed occupancy on any accessible tributaries, e.g., tributary with DCH (Rocky Gulch) + tributary that intersects with Rd 28N06 crossing (note: crossing no longer present). Location =T28N; R4E; Sec 8 (tributary enters Mill Creek downstream of Hole in the ground).

Deer Creek: contains occupancy for both species that overlaps their DCH.

Battle Creek and Butte Creek: no occupancy on the Lassen National Forest, but are under specific management direction with the Lassen National Forest Land and Resource Management Plan and the Sierra Nevada Forest Plan Amendment.

Total miles of anadromous habitat present within the boundary of the Lassen National Forest is estimated at 25 miles for Deer Creek, 43 miles for Mill Creek, and 7 miles for Antelope Creek.

The California Department of Fish and Game (CDFG) has been working with PG&E and other interested parties to restore and enhance anadromous fish passage around several water diversion dams located on both forks of Battle Creek. As of November 2011, fish passage work has been mostly completed on all water diversions found on North Fork Battle Creek, with the upper limit to anadromy now located at a natural fish barrier located approximately 13 miles downstream of the Lassen National Forest boundary and 2 miles upstream of the confluence of Bailey and North Fork Battle creeks. Work is currently underway on fish passage enhancement around three diversion dams located on South Fork Battle Creek. It is anticipated that spring-run Chinook salmon would have access to habitat upstream of these dams with upstream migration of spring-run Chinook salmon anticipated to come within 2 to 3 miles of NFS lands in the vicinity of Angel Falls, a natural barrier to anadromy. Current utilization of habitat downstream of Angel Falls by steelhead is unknown. However, like with spring-run Chinook salmon, completion of restoration efforts is expected to improve access for steelhead to habitat on the South Fork upstream to Angel Falls as well (Mayes personal comm. 2016).

Designated critical habitat for both species is identified within the Lassen National Forest boundary in Antelope, Mill, and Deer Creeks. In the Panther Creek drainage (Upper South Fork Battle Creek subwatershed), critical habitat has also been designated for steelhead. The latter DCH within the project area, however, is associated with a small, headwater stream/shallow intermittent lake (Panther Creek/Dry Lake), which lacks suitable habitat for steelhead. Specifically, and Dry Lake in particular, there is no stream habitat that provides any of the following three primary constituent elements of DCH: spawning, rearing, or migration habitat. Additionally, the species is not in close proximity to the Lassen National Forest boundary; the upper extent of habitat known to be currently occupied by steelhead is more than 10 miles downstream of the forest boundary in the South Fork of Battle Creek.

Therefore, due to the lack of primary constituent habitat elements in the Panther Creek drainage DCH, and the lack of proximity to this DCH, the primary area of analysis for the two listed anadromous fish considers the aquatic features (perennial streams) designated as critical habitat that are occupied by the species and, their associated RCAs on NFS lands within the project area in the Antelope, Mill and Deer Creek DCHs.

Sierra Nevada yellow-legged frog (Rana sierrae) -- Endangered

Affected Environment

Sierra Nevada (mountain) yellow-legged frog (*Rana sierrae*) is an endangered species with Final Designated Critical Habitat under the ESA. On April 25, 2013, the Fish and Wildlife Service published a proposal in the *Federal Register* (Vol.78, No. 80) proposing listing the Sierra Nevada yellow-legged frog as endangered and designating critical habitat. On April 29, 2014, the final rule was published in the *Federal Register* (Vol. 79, No. 82) designating the species endangered, with an effective date of this final rule on June 30, 2014. A final rule on DCH became effective on September 26, 2016. The criterion for the listing was based on the danger of extinction throughout the species' entire range and on the immediacy, severity, and scope of the threats to its continued existence. These threats include habitat degradation and fragmentation, predation and disease, climate change, inadequate regulatory protections, and the interaction of these various stressors impacting small remnant populations. There has been a range-wide reduction in abundance and geographic extent of surviving populations of frogs following decades of fish stocking, habitat fragmentation, and, most recently, a disease epidemic. This combination of population stressors makes persistence of the species precarious throughout the currently occupied range in the Sierra Nevada.

The project area supports potential suitable habitat for the Sierra Nevada yellow-legged frog (*Rana sierrae*). The Sierra Nevada yellow-legged frog is endemic to the northern and central Sierra Nevada and adjacent Nevada ranging from north of the Feather River (including the Plumas and southern edge of the Lassen National Forest) south to the Monarch Divide on the western side of the Sierra Nevada crest (Sierra National Forest), and near Independence Creek on the eastern side of the Sierra Nevada crest (Inyo National Forest).

Suitable habitat typically occurs above 4,500 feet in elevation, but in some areas, including the western side of the Plumas National Forest, it is thought to occur as low as 3,500 feet in elevation. Suitable habitat includes permanent waterbodies or those hydrologically connected with permanent water such as wet meadows, lakes, streams, rivers, tarns, perennial creeks, permanent plunge pools within intermittent creeks, and pools, such as a body of impounded water contained above a natural dam. Suitable habitat includes adjacent areas, up to a distance of 82 feet. When waterbodies occur within 984 feet of one another, as is typical of some high mountain lake habitat, suitable habitat for dispersal and movement includes the overland areas between lake shorelines. In mesic areas such as lake and meadow systems, the entire contiguous or proximate areas are suitable habitat for dispersal and foraging.

The Sierra Nevada yellow-legged frog inhabits a variety of habitats including lakes, ponds, tarns, wet meadows, and streams from near 4,500 feet to 12,000 feet (Zweifel 1955; Stebbins 1985; Zeiner et al. 1988). At lower elevations, particularly in the northern part of their historic range, the frogs are known to be associated with rocky streambed and wet meadows surrounded by coniferous forest (Zweifel 1955; Zeiner et al. 1988). Sierra Nevada yellow-legged frogs use a variety of different habitats throughout the year for breeding, feeding, and overwintering sites (Matthews and Preisler 2010).

Breeding occurs in the spring, from April to July depending on elevation, as soon as the ice on the lakes, ponds, and streams recedes. Females deposit eggs in clusters attached to vegetation, granite, and under undercut banks (Matthews and Pope 1999, Zweifel 1955). Females lay from 40 to 300 eggs in a compact cluster. Emergence from the egg occurs after approximately 2 to 3 weeks. Tadpoles often congregate in the warm shallows near shore where they feed on algae. *R. sierrae*

tadpoles may overwinter 2 to 3 times before metamorphosing (Zweifel 1955). Due to their long larval life stage breeding sites must remain a permanent water source year round. After metamorphosis, *R. sierrae* can remain juveniles for up to four years before reaching sexual maturity. *R. sierrae* are long-lived with a maximum recorded estimated age of 14 years (Matthews and Miaud 2007).

After breeding, adults may disperse into a larger variety of aquatic habitats (Pope and Matthews 2001). *R. sierrae* often move hundreds of meters between breeding, feeding, and overwintering habitats (Pope and Matthews 2001). The frogs appear to use a restricted set of lakes that provide suitable microhabitats for breeding and overwintering then disperse into a greater number of sites during the summer months for feeding (Matthews and Pope 1999, Matthews and Preisler 2010, Pope and Matthews 2001). Frogs can be found along shallow, rocky shorelines often interspersed with vegetation (Mullally and Cunningham 1956). *R. sierrae* use a variety of cover including vegetation, logs, and partially submerged trees. Similar to tadpoles, adults and subadults seek areas with warmer water (Bradford 1984). In high-elevation habitats, Sierra Nevada yellow-legged frog may spend up to nine months overwintering under ice in lakes and streams. Frogs have been found overwintering in the bottoms of lakes and in protected nearshore microhabitats including deep underwater rock crevices under banks and under ledges (Bradford 1983, Matthews and Pope 1999).

Genetic analyses of the *R. sierrae* indicate that the species is divided into three distinct subpopulations called “clades” (Vredenburg et al. 2007). Clade 1 is in the northwest portion of *R. sierrae* range and occurs on the Lassen and Plumas National Forests. This region is relatively low elevation and contains some of the lowest known *R. sierrae* populations. Environments in this clade are relatively unique for this species because they are predominantly forested. The species commonly inhabits streams in this area, likely because lakes are scarce. Little is known about the ecology of the species in this region including its historic distribution and abundance, where it breeds, and how it uses stream habitats. Only 5 to 6 known populations exist within this clade and all are on the Plumas National Forest.

The Lassen National Forest is the northernmost forest in the Sierra Nevada with documented distribution of *R. sierrae*. Based on historic records from museum collections (Museum of Vertebrate Zoology, University of California at Berkeley; California State University, Chico; California Academy of Sciences, San Francisco) the range of the species has been determined to be limited to certain watersheds on the Almanor Ranger District of the Lassen (USDA Forest Service 2010). Considering historic records (HR), recent positive detections (RPD) and/or potential suitable habitat (PSH), there are five 5th field watersheds considered to represent the range of the species on the Lassen; Butt Creek (HR), Yellow Creek (PSH), Upper Butte Creek (HR), West Branch Feather River (HR) and Middle North Fork Feather River (RPD).

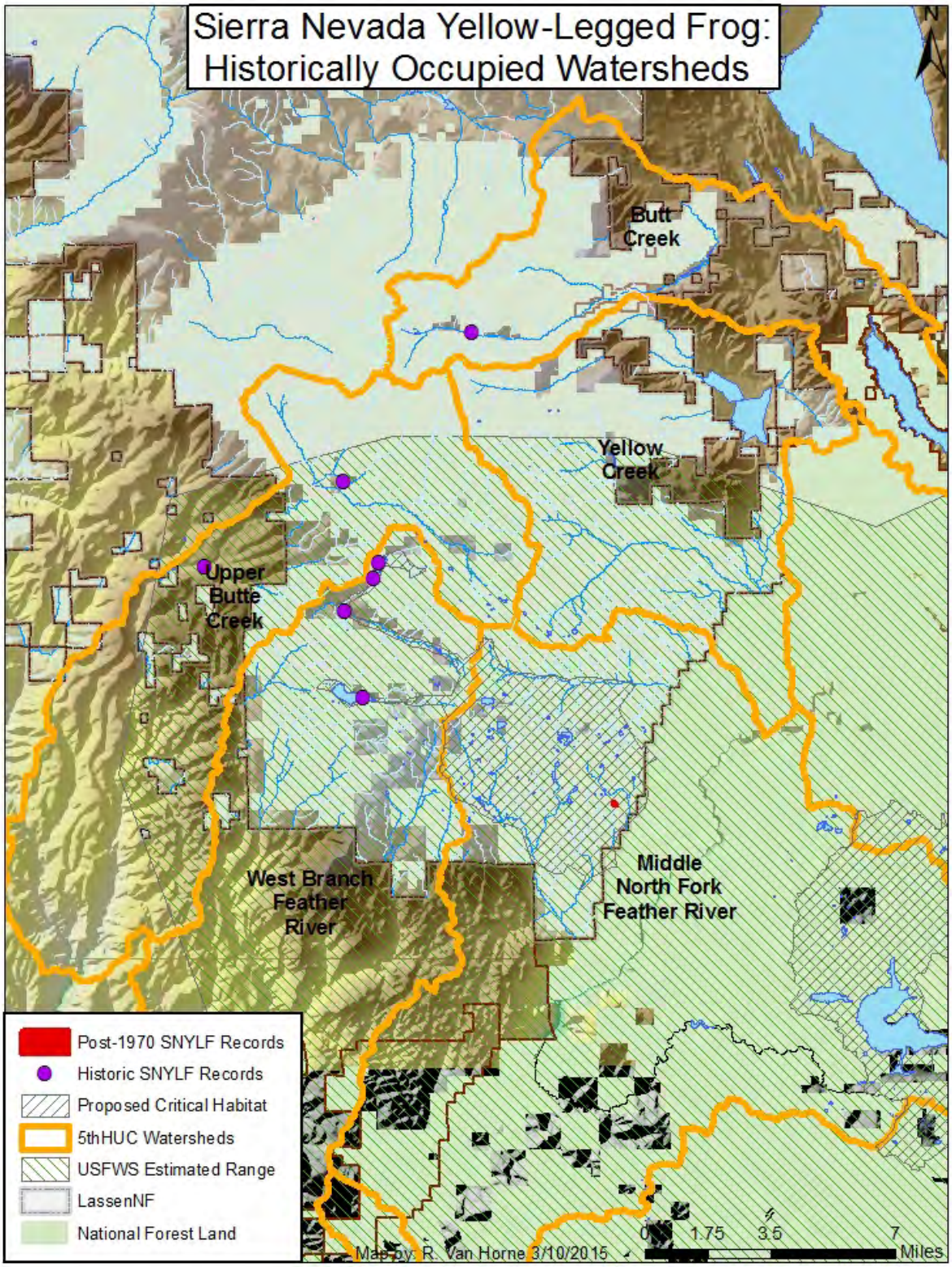

Figure 19. Historically occupied watersheds of Sierra Nevada yellow-legged frog

No extant populations of *R. sierrae* are currently known to exist on the Lassen. The only (remnant) population of the species last discovered on the Lassen National Forest was in a remote lake (Oliver)

and associated pond in 2005, in the Mill Ranch Creek 6th field subwatershed. Three subsequent surveys conducted by the California Department of Fish and Wildlife had no positive detections, thus the population is believed to be extirpated.

Cascades frog (Rana cascadae) Forest – Sensitive

Affected Environment

Life History

The following life history information was taken from Pope et al. (2014):

Cascades frogs breed shortly after spring snowmelt. Males appear first and form chorusing groups when melting ice and snow creates open water along the edges of water bodies. During breeding, females swim primarily underwater to breeding sites and leave the site as soon as breeding is complete. Oviposition occurs between April and July, depending on seasonal conditions and elevation. Egg masses are often laid communally in pond and lake habitats. In the high-elevation habitats in California, larvae usually hatch in early to mid-July and metamorphose into frogs in September. However, some larvae do not successfully complete metamorphosis prior to the onset of winter. No larvae have been observed to survive the winter. In the southern Cascades, larvae usually hatch in June and metamorphose in late August.

Cascades frogs are relatively long-lived and late maturing. A skeletochronology study conducted in the Klamath Mountains found that frogs can live more than 10 years. Adult Cascades frogs display a high degree of site fidelity. At Deep Creek Basin in the Trinity Alps Wilderness, Garwood (2009) found that adults commonly move among unique breeding, feeding, and overwintering habitats following a consistent annual pattern (see "Movement" section). At other sites where breeding, feeding, and overwintering habitat occur at the same site, frogs may remain at the same waterbody throughout the year.

Lake habitats are important for breeding and overwintering of Cascades frogs. Based on the frog's movement patterns and distribution in early spring and late fall, overwintering habitat is almost as restrictive as breeding habitat. In late fall, Garwood (2009) found frogs congregated at spring-fed ponds and lakes, and perennially flowing streams (although the frogs may have been using the streams as movement corridors to lentic overwintering habitats). The frogs are suspected of overwintering in aquatic sites that do not freeze solid (e.g., springs and deep lakes), similar to the mountain yellow-legged frog (*Rana muscosa* and *R. sierrae*) in the Sierra Nevada. Cascades frogs have been found overwintering in deep, loose silt at the bottom of a pond and in surrounding springwater-saturated ground.

Distribution

The Cascades frog is known (historically and/or currently) to utilize habitat above approximately 4,500 feet in elevation in the following 16 sixth-field subwatersheds that encompass, in whole or in part, Lassen National Forest: Headwaters of Hat Creek, Upper Old Cow Creek, Upper SF Battle Creek, Bailey Creek (within Battle Creek system), Upper NF Battle Creek, Upper Mill Creek, Sacramento-Deer, Butte Creek, Bailey Creek (within Feather River system), Louse Creek, Rice Creek, Butt Valley Reservoir, Juniper Lake, Big Kimshew Creek, Upper West Branch Feather River, and Lower Yellow Creek.

For subwatersheds where historic information is available (e.g., via voucher specimens), almost all collections have enough information to indicate which sixth-field subwatershed the specimens were

associated with. In only one or two subwatersheds is there some uncertainty of the specific collection location; in these circumstances, nearby subwatersheds with potential suitable habitat were included in the analysis (e.g., Coyote Flat). In the Upper Yellow Creek subwatershed, 4,250 feet is presumed to be the approximate lower elevation for this species, based on existing habitat conditions. In the Screwdriver Creek subwatershed, the Cascades frog is known (presently) above approximately 2,500 feet in elevation.

Present occupancy (defined here as more than one individual observed at one time since the 1990s and, with one or more individuals still present) is only known within five sixth-field subwatersheds: Upper Old Cow Creek, Sacramento-Deer, Butte Creek, Juniper Lake, and Screwdriver Creek (Pope 2008). Only two incidental observations of individual Cascades frogs have been made outside known breeding populations; one adult frog was observed in the Sacramento-Deer subwatershed in Alder Creek in 2002 (Roby 2002) and one adult was observed in the Shanghai Creek subwatershed on Butt Creek in 1996 (Brown 2000). Within the Rice Creek subwatershed, two Cascade frogs were also found in Crumbaugh Creek (in Lassen Volcanic National Park) in the early 1990s, but this species has not been found there since 1994 (Fellers et al. 2008).

From extensive amphibian surveys conducted on Lassen National Forest (Fellers et al. 2008), it is probable that this species is no longer present in the remaining 10 subwatersheds where it historically occurred (e.g., pre-1970s), as documented from available sources of historical accounts including, but not limited to, Zweifel (1955), Grinnell et al. (1930), various museums (e.g., California State University Chico, Museum of Vertebrate Zoology), Fellers and Drost (1993) and Koo et al. (2004)). According to Fellers et al. (2008), there could be a few populations that went undetected in the surveys conducted, but "it is unlikely that any large *R. cascadae* populations exist in the Lassen area" (the Lassen area referred to is defined as lands within a 50-kilometer radius of Lassen Pea,k so this excludes the northern area with existing populations within Screwdriver Creek subwatershed). Fellers (ibid) concluded "the small size of, and lack of connectivity between, the current populations of *R. cascadae* in the Lassen area greatly reduces their long-term viability, potentially leading to a genetic bottleneck (Young and Clarke 2000)." The existing Cow Creek population (represented by a minimum of two breeding sites) on private lands off Lassen National Forest, however, "…may represent the largest extant population of *R. cascadae* in the Lassen region…" (Stead and Pope 2007).

The area of effect for the Cascades frog conservatively considers all of the following aquatic features; springs, perennial streams, lakes, ponds, wetlands and fens, and their associated RCAs on Lassen National Forest lands above the elevational range for all 18 subwatersheds listed previously within the project area. Additionally, within the Sacramento-Deer and Butte Creek sixth-field subwatersheds, Carter and Colby/Willow CARs are designated for the Cascades frog (USDA Forest Service 2004). Populations are present in both the Carter and Colby/Willow CARs.

Table 177. Survey records of Cascades frog historical or occupied occurrence by 6th field subwatershed within the Lassen National Forest

6th field subwatersed name	Cascades frog	Documented Occurrences
	Historical	Occupied
Big Kimshew Creek	2	
Bull Creek-Butte Creek	1	
Butt Valley Reservoir-Butt Creek	1	
Colby Creek-Butte Creek		2

6th field subwatersed name	Cascades frog	Documented Occurrences
	Historical	Occupied
Cub Creek-Deer Creek	1	2
Deer Creek	3	
Gurnsey Creek		2
Last Chance Creek-West Branch Feather River	1	
Lost Creek-Deer Creek	2	1
Lower Yellow Creek	2	
Nelson Creek		1
Rock Creek-Pit River	1	1
Soldier Creek-Butt Creek	2	
Upper Mill Creek	7	
Upper Old Cow Creek		1
Upper South Cow Creek		1
Upper South Fork Battle Creek	3	
Upper Yellow Creek	1	
Warner Creek	5	1
Willow Creek-North Fork Feather River	5	
Grand Total	37	12

Black Juga (Juga nigrina)

Affected Environment

The black juga is an aquatic mollusk occupying perennial stream and spring habitat in the Lassen, Tahoe, and perhaps Shasta-Trinity National Forests. This species occurs in the upper Sacramento, McCloud and Pit River systems (Frest and Johannes 1995). Recent analyses on anatomy and genetics has established that the black juga is a composite and as presently understood taxonomically, is restricted in California to the upper Sacramento system (USDA Forest Service 2014), Brim Box (2005) reported finding 575 individuals at 22 of 113 survey sites on the Lassen National Forest. In general, this species is located within large tributaries and some springs of Hat Creek, Lost Creek, Deer Creek, Domingo Creek, Davis Spring, Soldier Creek, Beaver Creek, Antelope Creek, North Fork Feather River, Gurnsey Creek, and the Pit River. Brim Box (2005) noted that this species is not restricted to a particular area on the Lassen National Forest. Additionally, this species is fairly common within the region where populations currently exist, however, it appears that the species has been extirpated from many historic locations within tributaries to the upper Sacramento River.

Suitable habitat for this species has been identified as perennial streams and springs with prominent channel substrate being comprised of boulders/cobble, gravel, sand, and in some cases, mud (Brim Box 2002). Black juga habitat is threatened by excessive sedimentation resulting from various land management activities, including mining, logging, road and railroad grade construction, and grazing. Increased sedimentation may result in smothering of suitable channel substrate, increased stress and mortality, and impairment of egg-laying or survival of eggs and young. Livestock utilization in close proximity to suitable habitat may result in reduced dissolved oxygen levels, and elevated water temperature if removal of riparian vegetation and/or increases in channel width-to-depth ratios occur. Additionally, water diversions can result in reduced spring/stream flow, elevated water temperature, increased sedimentation, and lower dissolved oxygen.

Environmental Consequences

Project Design Features and Monitoring

The following project design features and mitigation measures were developed to be used as part of the implementation of the action alternatives. These practices would apply to all alternatives unless specified only for a specific alternative. These features were developed to reduce or eliminate adverse impacts from project activities and are incorporated as an integrated part of each alternative. Project design features are based upon standard practices and operating procedures that have been employed and proved effective in similar circumstances and conditions.

Project design features do not apply to the no-action alternative because no project activities are proposed; no changes would be made to the existing system of OSV trails or areas in the planning area under the no-action alternative. However, continuing current management under the no-action alternative would include the use of standard operating procedures and best management practices for routine OSV trail grooming and maintenance of the current OSV trail and area system.

Forest Service National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide (BMPs, USDA Forest Service 2012) applicable to OSV use would be implemented under all of the action alternatives.

The following describes the minimization measures for watershed resources that are used as a proxy for aquatic resources measures that would be applied to the management of OSV uses on the Lassen National Forest:

Minimizing Damage to Watershed Resources

All Public OSV Use:

1. The objective of minimizing impacts of public OSV use to watershed resources would be addressed by adhering to Best Management Practices related to Over Snow Vehicle Use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook.

Groomed Snow Trails:

1. The objective of minimizing impacts to watershed resources would be addressed by making spill containment equipment available at the facilities where grooming equipment is re-fueled.

    - The objective of minimizing impacts to watershed resources would be addressed by designating equipment maintenance and refueling sites to ensure that they are located on gentle slopes, on uplands, and outside of riparian conservation areas and sensitive terrestrial wildlife habitats.
    - To address the objective of minimizing impacts to watershed resources, all stream crossings and other in-stream structures facilitating OSV passage would be designed and maintained to provide for the passage of flow and sediment, to withstand expected flood flows, and to allow for free movement of resident aquatic life.
    - To address the objective of minimizing impacts to watershed resources, public OSV use of trails and grooming snow trails for OSV use would be prohibited in wetlands unless protected by at least 12 inches of packed snow or 2 inches of frozen soil. If OSV trails must enter wetlands, bridges or raised prisms with diffuse drainage to sustain flow patterns would be used.

- To address the objective of minimizing impacts to watershed resources, crossing bottoms would be set at natural levels of channel beds and wet meadow surfaces.
- To address the objective of minimizing impacts to watershed resources, actions that dewater or reduce water budgets in wetlands would be avoided.

Public, Cross-country OSV Use:

1. The objective of minimizing impacts to watershed resources would be addressed by prohibiting public, cross-country OSV use when and where there is less snow coverage than sufficient to prevent damage to underlying soil and vegetation resources.
2. The objective of minimizing impacts to watershed resources would be addressed because public, cross-country OSV use would be generally dispersed and would not result in high concentration of OSV use on bare soil. Also, travel over bare soil can damage machines so is generally avoided by operators. With adequate snow depths, this plan would result in no soil erosion and therefore would not create water quality impacts to streams or water bodies by introducing sediment in water runoff.
3. The objective of minimizing impacts to watershed resources would be addressed by prohibiting public OSV use on unfrozen lakes, reservoirs, ponds and any other open surface water.
4. The objective of minimizing impacts to watershed resources would be addressed by providing information to the public of the hazards of running OSVs on thin ice and the effects of OSV emissions on air quality and water quality.

Monitoring to Minimize Impacts to Watershed Resources:

1. The objective of minimizing impacts to watershed resources would be addressed by monitoring to determine if implementing protective measures ensures that aquatic resources are adequately protected. Possible protective measures include restricting access to aquatic communities where substantial impacts are observed through the dissemination of educational materials and by using signage, or, if necessary, through the use of barriers or trail re-routes.
    - The objective of minimizing impacts to watershed resources would be addressed by monitoring in consultation with forest biologists to ensure that public OSV use is not damaging sensitive resource locations.
    - The objective of minimizing impacts to watershed resources would be addressed by monitoring water quality in spring snowmelt periodically at specified locations, in consultation with the forest hydrologist and aquatic biologist, to determine potential impacts of public OSV use on water quality. If adverse impacts are observed, changes in management of public OSV use would be considered, or other appropriate protective measures would be taken, in consultation with a forest hydrologist.
    - The objective of minimizing impacts to watershed resources would be addressed by periodically monitoring the effects of public OSV use with sufficient snow coverage over road or trail surfaces.
    - The objective of minimizing impacts to watershed resources would be addressed by periodically monitoring water quality in spring snowmelt periodically at specified locations, in consultation with the forest hydrologist and aquatic biologist, to determine potential impacts of OSV exhaust on water quality. If adverse impacts are observed, changes in management of OSV use would be considered, or other appropriate protective measures taken, in consultation with a forest botanist.

- Sections 208 and 319 of the Federal Clean Water Act (CWA) address nonpoint source pollution and require water quality management plans for nonpoint sources of pollution. The Forest Service in the Pacific Southwest Region (Region 5) has worked with the California water quality agencies to meet CWA requirements. The greatest emphasis in this coordination has been on the management and control of nonpoint sources of water pollution, with sediment, water temperature, and nutrient levels of most concern.
- The State Water Resources Control Board and Regional Water Quality Control Boards entered into agreements with the Forest Service to control nonpoint source discharges by implementing best management practices. These best management practices, which are set forth in the Forest Service Pacific Southwest Region guidance document, "Water Quality Management for Forest System Lands in California, Best Management Practices" (USDA Forest Service 2000), constitute a portion of the State's Nonpoint Source Management Plan and comply with the requirements of Sections 208 and 319 of the CWA.
- The agreements include best management practices related to OSV use, and to road construction and maintenance. The implementation and effectiveness of the best management practices are reviewed annually. In recent years, the Forest Service has emphasized monitoring in national forests to ensure the implemented projects follow approved control measures.
- The Forest Service best management practices are in conformance with the provisions and requirements of the Federal CWA and within the guidelines of the Basin Plans developed for the nine Regional Water Quality Control Boards in California. The best management practices most relevant to the OSV Program pertain to snow removal and monitoring (Volume II, Appendices E and F).
- For the 6-inch or less minimum snow depths allowed on trails (alternatives 2 and 4), operation of OSVs would be monitored periodically when use is allowed at every site where this standard would apply when snow is less than 12 inches deep. Monitoring would be consistent with BMP 4-7 (Volume II, Appendix E) and focus on whether OSVs are impacting trail surfaces, and be reported to the Forest or District hydrologist and soil scientist. If adverse effects are observed to occur on trail surfaces, use should be discontinued.

Effects Common to All Alternatives

Because the alternatives are very similar, with the same activities proposed, and the differences are mainly the spatial extent of OSV use, most of the effects are described in this section. The varying areas of authorized OSV use would result in mostly small differences in degree of potential effects. Therefore, each alternative's effects will mainly summarize the extent of aquatic resources affected, and provide the basis for determinations.

Direct Effects Introduction

Direct effects are caused by the action and occur at the same time and place. A key difference between OSV use and other types of motor vehicle use is that, when properly operated and managed, OSVs do not make direct contact with soil, water, and ground vegetation, whereas most other types of motor vehicles operate directly on the ground (USDA Forest Service 2014).

Direct impacts to fish and amphibians would be extremely rare as amphibians hibernate during the winter, and OSVs would have to travel through water to collide with fish. Due to the rarity of this occurring, the direct impacts to fish and amphibians are considered less than significant.

Indirect Effects Introduction

Indirect effects are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable. Potential indirect impacts include snow compaction and impaired water quality or pollutants entering waterways, which are described below.

Snow Compaction

Snow compaction could indirectly affect aquatic species through delayed snowmelt, affecting the hydrologic regime, and alteration of habitat or riparian vegetation potentially leading to erosion and sediment into waterways.

Widespread snow compaction from cross-country OSV uses can affect melt patterns, and in turn the hydrologic regime. Studies have found delayed snowmelt in areas compacted by OSVs versus areas of uncompacted snow (Keddy et al., 1979; Neumann and Merriam, 1972). During spring snowmelt, these effects can reduce the ability of the snow to slow runoff. It is unknown how much OSV-related snow compaction would affect runoff rate and timing, but some studies suggest up to a two week delay. Because snow compaction from off-trail cross-country use is currently not extensive on a watershed scale, measureable changes in hydrology are not expected (McNamara 2018).

Riparian vegetation important to aquatic species could potentially be affected by snow compaction. Due to snow compaction, early spring growth of some plant species may be retarded or may not occur under an OSV trail; however, the current and proposed OSV trails are underlain by existing roads and trails which are already compacted and/or disturbed and little, if any, additional impacts are expected to the vegetation. Trail grooming on the Lassen National Forest occurs over an existing road and trail network and does not alter landforms or result in significant soil disturbance that would change water flow patterns or quantities of surface water runoff. Trail grooming does not cause substantial impacts to water quality, perennial, intermittent or ephemeral streams, wetlands or other bodies of water (Hydrology report, McNamara 2018).

Cross-country OSV use could affect woody riparian species by bending and breaking of branches by recreationists running over the branches (Neumann and Merriam 1972). This is most likely to occur with lower snow depths such as the beginning of the winter season and before sufficient snow has accumulated to protect vegetation, and during spring snowmelt. Regenerating timber could also be affected by bending and breaking of leaders with inadequate snow depth. However, both the hydrology report (project record) (McNamara 2017) and botany report (project record) (Davidson 2017) concluded that vegetation trampling from OSVs and potential impacts to riparian resources from OSV use would be considered negligible with adequate snowpack coverage.

Disturbance to soil and vegetation by OSV use is reduced as snowpack depths increase. Damage to soil and low-growing vegetation is much more likely when OSV use occurs under low snow conditions (Greller et al. 1974, Fahey and Wardle 1998). Thus, the minimum snow depth requirements of all alternatives are expected to prevent or minimize damage to soil and vegetation (Davidson 2017). On the Lassen National Forest, OSV travel on snow-free areas is prohibited in the current and proposed scenarios. By not allowing cross country OSV use when and where there is less than 12 inches snow depth, the Lassen National Forest minimizes the possibility of direct damage to soils and ground vegetation.

Similarly, the hydrology analysis (McNamara 2018) found that with adequate snow depth, cross-country use of OSVs would have a negligible effect on ground disturbance that could lead to erosion and sedimentation in streams or other water bodies, and a negligible effect on vegetation, especially along streams and other waterbodies. It further states "…off-trail OSV use would be generally

dispersed and would not result in high concentration of OSV use on bare soil. Also, travel over bare soil can damage machines so is generally avoided by operators. With adequate minimum snow levels, this plan would result in no more than incidental soil erosion and therefore would not create water quality impacts to streams or water bodies by introducing sediment in water runoff."

These conclusions are generally attributed to the fact that OSV use on the Lassen National Forest is considerably less than Yellowstone National Park where detailed studies were conducted on OSV use and their potential effects to the aquatic environment and hydrologic regime.

The number of snowmobiles that entered Yellowstone in 2003 and 2004 was 47,799 and 22,423, respectively (Arnold and Koel 2006). The estimated seasonal day use of OSV Program trails across the Lassen National Forest is around 10,000 OSVs. These visitations are spread across multiple trailheads and trail systems and do not all occur in the same location. As a result OSV seasonal use levels at any Lassen National Forest trailhead or trail system are considerably less than OSV use that occurred at Yellowstone National Park, and are considered very low. Since Yellowstone OSV use levels studied had not resulted in impaired water quality, due to much lower use numbers, it follows that the OSV use in the project area from the Lassen National Forest OSV Use Designation would not adversely affect snowmelt water quality.

Snow Compaction Effects Summary

There are no effects to aquatic species from snow compaction along designated OSV trails because aquatic species are not present. Away from the designated OSV trails, dispersed cross-country OSV travel is much less likely to compact snow with enough intensity and repetition to measurably or predictably affect ground vegetation or the hydrologic regime, and therefore, snow compaction is not considered further in this analysis as a reasonably foreseeable source of indirect effects to aquatic species.

Pollutants

Emissions from OSVs, particularly two-stroke engines on OSVs, release pollutants including ammonium, sulfate, benzene, nitrogen oxides, ozone, carbon dioxide, carbon monoxide, aldehydes, polycyclic aromatic hydrocarbons and other toxic compounds into the air. A portion of these compounds may become trapped and stored in the snowpack, to be released during spring runoff. Four-stroke OSV engines produce considerably lower amounts of pollutants.

Some of the airborne pollutants would enter the snowpack and be released during snowmelt. Similar responses can be assumed to occur in aquatic species that ingest these compounds from snowmelt, although the compounds may undergo chemical changes while in the snowpack, confounding the predictability of effects.

Airborne pollutants can enter the snowpack from both local and regional sources, including but not limited to vehicle emissions, dust storms, and smog. The concentrations of basic cations and acidic anions in the snowpack can be altered and, when released quickly during snow melt, can temporarily lower the pH of surface waters in a process known as "episodic acidification" (Blanchard et al. 1988).

Demonstrating that snowpack chemistry can be used as a quantifiable indicator of airborne pollutants from vehicular traffic, a correlation was shown between pollutant levels and vehicle traffic in Yellowstone National Park (Ingersoll et al. 1997). Ammonium and sulfate levels were consistently higher for the in-road snow compared to off-road snow, but nitrate concentrations did not decrease within a distance of 100 meters from the emission source; thus, the nitrate ion may be used to

distinguish between local and regional emission sources (Ingersoll et al. 1997). Studying snow chemistry in Yellowstone National Park, Ingersoll (1998) found that concentrations of ammonium, nitrate, sulfate, benzene, and toluene were positively correlated with OSV use. Concentrations of ammonium were up to three times higher for the in-road snow compared to off-road snow. Concentrations decreased rapidly with distance from roadways.

Arnold and Koel (2006) also examined volatile organic compounds in Yellowstone National Park, and found that the snow in heavily used areas contained higher levels of benzene, ethylbenzene, m- and p-xylene, o-xylene, and toluene compared with a control site only 100 meters from the traveled roadways. Even at the most heavily used area (Old Faithful) they found that the concentrations of volatile organic compounds were considerably below the Environmental Protection Agency's water quality criteria for these compounds.

In situ water quality measurements (temperature, dissolved oxygen, pH, specific conductance, and turbidity) were collected; all were found within acceptable limits. Five volatile organic compounds were detected (benzene, ethylbenzene, m- and p-xylene, o-xylene, and toluene). The concentrations were found below EPA criteria and guidelines for the volatile organic compounds analyzed and were below levels that would adversely impact aquatic ecosystems (Arnold and Koel 2006).

Studying air quality and snow chemistry effects from OSVs in the Snowy Range, Wyoming, Musselman and Korfmacher (2007) found that heavier OSV use resulted in higher levels of nitrogen oxides and carbon monoxide, but ozone and particulate matter were not significantly different. When compared with air quality during the summer, they found that carbon monoxide levels were higher in the winter, but nitrogen oxides and particulate matter were higher in the summer. Air pollutants were well-dispersed and diluted by winds, and air quality was not perceived as being significantly affected by OSV emissions. Pollutant concentrations were generally low in both winter and summer. These results differ from those studies examining air pollution from OSVs in Yellowstone National Park. However, snow chemistry observations did agree with studies from Yellowstone National Park. Compared with off-trail snow, the snow sampled from OSV trails was more acidic with higher amounts of sodium, ammonium, calcium, magnesium, fluoride, and sulfate. OSV activity apparently had no effect on nitrate levels in the snow.

In the winter, overwintering amphibians are typically hibernating. Airborne compounds would only be taken up by respiring species. Airborne pollutants normally disperse quickly in mountain environments that are prone to windy conditions, such as the Sierra Nevada. The levels of OSV exhaust contaminants on the Lassen National Forest (considerably less than those observed in Yellowstone National Park) are not expected to impair water quality (McNamara 2018).

The available research on OSV pollutants (both airborne and in the snowpack) indicate that some effects to aquatic species may occur in the immediate vicinity of heavy use areas. Pollutants that become trapped in the snowpack are also concentrated in areas of heavy OSV use.

Away from the designated OSV trails, dispersed OSV travel is much less likely to contribute harmful contaminants with high enough levels and repetition to measurably or predictably affect aquatic resources, and therefore, is not considered in this analysis as a reasonably foreseeable source of indirect effects.

Based on multi-year studies in Yellowstone National Park, researchers concluded that Yellowstone OSV use levels have not resulted in impaired water quality. Given that OSV use levels on the Lassen NF at OSV trailheads are less than OSV use levels occurring at Yellowstone during the study period,

it is determined that water quality is not impaired by the OSV Program (Hydrology report, McNamara 2018).

There are few studies regarding effects of OSVs on aquatic biota but, Adams (1975) addressed the effects of high levels of lead and hydrocarbons from OSV exhaust on brown trout (*Salvelinus fontinalis*). His study found that that high-level exposure to lead and hydrocarbon can lower activity levels and feeding. The alternatives of the OSV Use Designation project are expected to have negligible effects to water quality and fish, because OSV use on the Lassen National Forest is widely dispersed and does not occur at concentrations that have been shown to cause adverse effects to water quality or aquatic organisms. The results of the Adams Study support this contention and state that the levels of hydrocarbons found in the study are "unrealistic for all but a few small lakes in well populated areas."

Pollutants Effects Summary

The uptake of harmful pollutants is not expected to result in the death of any individual aquatic species on the Lassen National Forest, based on the studies described, and the findings related to water quality impacts. Therefore, the level of effect to TEPS aquatic species from OSV pollutants is expected to be minimal, and would not result in loss of individuals.

Based on findings on studies of OSV-related effects to aquatic species and/or their habitat, negative impacts to special-status fish and amphibians due to impaired water quality are considered less than significant.

In addition, effects are more likely to occur along designated OSV trails compared to areas designated for cross-country OSV use because dispersed OSV travel is much less likely to contribute harmful contaminants with high enough levels and repetition to measurably or predictably affect aquatic resources.

Effects to Aquatic Species

Threatened and Endangered

Chinook salmon (Oncorhynchus tshawytscha) Central Valley Spring Run ESU and Central Valley steelhead (Oncorhynchus (=salmo) mykiss)

Direct and Indirect Effects

Direct effects to *O. tshawytscha and O. mykiss* individuals from OSV use would not occur because OSV use is prohibited over open water.

Pollutants that are trapped and then later released during snowmelt could have some adverse indirect effects if in close proximity to *O. tshawytscha* or *O. mykiss* occupied streams. However, the probability of this occurring and the potential resultant pollutant concentration is expected to be low because of the widely dispersed nature of cross-country OSV use in space and time. Similar conclusions are supported by the hydrology analysis, which determined that pollutant concentrations from OSV use entering waterways would be low enough that water quality would not be impaired.

There are would be no designated OSV trails that would cross occupied *O. tshawytscha* streams. Two crossings exist for *O. mykiss* and are described in table 180.

Chinook salmon (Oncorhynchus tshawytscha) Central Valley Spring Run ESU and Central Valley Steelhead (Oncorhynchus (=salmo) mykiss) Critical Habitat

Direct and Indirect Effects

There are a total of 62.9 miles of steelhead critical habitat and 52.73 miles of Chinook critical habitat within the Lassen National Forest administrative boundary.

Under alternative 1, there are a total of 18.34 miles and 22.73 miles of critical habitat within areas designated for cross-country OSV use for Chinook salmon and steelhead, respectively (table 180).

For alternatives 2, 3, 4, and 5, the total number of miles of critical habitat within areas designated for cross-country OSV use are 9.64, 10.73, 18.34, and 0.85, respectively (table 180).

There would be no crossings of Chinook critical habitat with designated OSV trails for any of the alternatives.

Two crossings exist under alternatives 1,4, and 5 where steelhead critical habitat intersects with designated OSV trails and one crossing under alternative 3 (table 180). The first crossing is on Turner Mtn. Loop (29N48), which is a gravel road in a heavily wooded area. It is a groomed OSV trail that crosses a culvert over Rock Gulch Creek. The area immediately south of the crossing is not designated for OSV use so no OSVs would cross Rock Gulch Creek outside of the groomed trail.

The second crossing is on Mineral Viola Hwy (31N17) and is a culvert over Panther Creek, just below Dry Lake. In the area of this crossing, Panther Creek is a small headwater stream and Dry Lake is a shallow intermittent lake which lacks habitat for steelhead. Along Panther Creek and Dry Lake there is no stream habitat that provides any of the following three primary constituent elements of DCH: spawning, rearing, or migration habitat. The upper extent of habitat known to be currently occupied by steelhead is more than 10 miles downstream of the Lassen National Forest boundary in the South Fork of Battle Creek. OSV use during the winter is not expected to result in habitat disturbance because the minimum snow depth of 12 inches is likely sufficient to prevent contact between OSVs and the soil surface. Based upon these factors discussed in the effects common to all alternatives, no soil disturbance would occur that would contribute to instream sediment increases.

The Lassen OSV Designation project does not involve the construction of any structures that could impede or redirect flood flows, nor any ground surface modifications that could change drainage patterns, impervious surfaces, soil permeability, or other hydrological characteristics such as surface water volumes (McNamara 2018).

Sierra Nevada yellow-legged frog Critical Habitat

Direct and Indirect Effects

Of the total 1,090,392 acres of Sierra Nevada yellow-legged frog critical habitat, approximately 2,518.4 acres are within the Lassen National Forest. Of which, a total of approximately 896 acres lay within areas designated for cross-country OSV use under alternatives 1, 2, 3, and 4. Alternative 5 has 771.8 acres of critical habitat within areas designated for cross-country OSV use.

There would be no designated OSV trails that cross or overlap with Sierra Nevada yellow-legged frog critical habitat for any of the alternatives.

Based upon factors described in the effects section, soil disturbance is not expected to occur that would contribute to instream sediment increases.

The Lassen OSV Designation project does not involve the construction of any structures that could impede or redirect flood flows, nor any ground surface modifications that could change drainage patterns, impervious surfaces, soil permeability, or other hydrological characteristics such as surface water volumes (McNamara 2018).

OSV use during the winter is not expected to result in habitat disturbance because the minimum snow depth of 12 inches is likely sufficient to prevent contact between OSVs and the soil surface.

Sensitive Species

Cascades frog (Rana cascadae)

Direct and Indirect Effects

Direct effects to Cascade frog are unlikely to occur and are considered less than significant because:

- OSV trails to be designated are outside historical or known occurrences of Cascade frog.
- Cascade frog are less active in winter when OSV use is most prevalent and would have to travel through water to collide with Cascade frog.

As documented in the Hydrology section, soil disturbance is not expected to occur that would contribute to pollutants or instream sediment increases.

Pollutants that are trapped and then later released during snowmelt could have some adverse indirect effects if in close proximity to Cascade frog suitable habitat. However, the probability of this occurring and the potential resultant pollutant concentration is expected to be low because of the widely dispersed nature of cross-country OSV use in space and time. Similar conclusions are supported by the hydrology analysis, which determined that pollutant concentrations from OSV use entering waterways would be low enough that water quality would not be impaired.

Compacted snow generally causes delayed snowmelt and increases the transfer of freezing temperatures to the ground due to reduced insulating air spaces (Keddy et al. 1979, Fahey and Wardle 1998, Davenport and Switalski 2006, Eagleston and Rubin 2012, Gage and Cooper 2013).

For Cascades frog, breeding occurs when snow begins to melt. The short delay of snowmelt and colder soil temperatures from OSV-compacted snow would not likely delay or reduce Cascades frog. The effects of snow compaction and OSV emissions are concentrated in areas of heavy use, such as along designated OSV trails. No Cascades frog occurrences are present within 100 feet of existing or proposed designated OSV trails; therefore, it is anticipated that there would be no measurable or predictable indirect effects to the occurrences.

Black Juga (Juga nigrina)

Direct and Indirect Effects

Black Juga would not be directly affected by current or proposed OSV uses because OSVs are not authorized to operate over unfrozen open water where black Juga may be present.

Pollutants that are trapped and then later released during snowmelt may have some adverse effects; however, the extent and direction of specific effects is unknown. Impacts to water quality are assessed in the Hydrology section, which concluded that water quality is not impaired by the Lassen National Forest OSV Project for any of the alternatives. For this reason, it is expected that pollutant

concentrations would be low enough that water quality would not be impaired for aquatic species, and thus, it is likely that *Juga nigrina* response would be discountable.

Cumulative Effects Alternative 1

Cumulative impacts can only occur when the likely impacts resulting from the proposed action or alternatives overlap spatially and temporally with the likely impacts of reasonably foreseeable future actions (FSH 1909.15, Sec. 15.2). It is assumed that the contribution of past actions to the cumulative effects of the proposed action result in current environmental conditions and are therefore used as a proxy for impacts of past actions. By looking at current conditions, residual effects of past human actions and natural events are captured, regardless of which particular action or event contributed those effects. Potential contributions of the proposed action to cumulative effects are therefore considered along with ongoing and reasonably foreseeable future actions.

Present and reasonably foreseeable future actions are listed in appendix H (Volume II) of this RFEIS and include vegetation management activities, maintenance of roads and campgrounds, road re-construction, fuels reduction activities, recreational use, timber harvest, and grazing. Potential effects to aquatic species or their habitat that are most likely to combine with present or reasonably foreseeable future actions, include disturbance to individuals from OSV use; habitat fragmentation or modification; and snow compaction effects on aquatic species habitat that could add sediment or other pollutants to surface waters.

Snow plowing at the established OSV trailheads is an ancillary activity associated with the Lassen National Forest OSV Designation project, and is not analyzed as a part of the proposal. Snow plowing is not expected to affect aquatic resources. Other ongoing and foreseeable future actions include livestock grazing, recreation, timber harvest, fuels reduction, woodcutting activities, wildfire suppression, and other activities.

There are many ongoing and reasonably foreseeable projects identified by the Lassen National Forest that may be ground-disturbing and could add sediment or other pollutants to surface waters within the forest. The Forest Service uses BMPs in compliance with the Clean Water Act to minimize water quality impacts. The Lassen National Forest monitors trails used for OSVs and implements BMPs to control erosion and other effects.

The risks of cumulative effects from this alternative are very low because existing requirements of adequate snow depths for OSV use appear to be sufficient to protect the ground surface. There would continue to be only incidental ground disturbance, low risk of damage to vegetation, and other direct and indirect effects. As a result, there would be no change to cumulative watershed effects or equivalent roaded acres calculations for any watersheds under this alternative (McNamara 2018). There would be negligible effects from exhaust emissions stored in snowpack. Over the long term, potential for increased sediment should be minimized with proper implementation of LRMP standards and guidelines for actions along stream channels and within riparian areas.

This alternative would not implement the recommended project design criteria or mitigation measures, and has the second highest amount of land area designated for OSVs. However, this alternative appears to have adequate snow cover requirements to protect soils, water, and aquatic resources, and to protect vegetation in riparian areas. This alternative would not directly conflict with LRMP standards and guidelines, and would not result in irreversible or irretrievable effects to soil, water, aquatic, or riparian resources.

Cumulative Effects- Alternatives 2 through 5

Alternatives 2, 3, 4, and 5 are discussed together because they have minor differences in terms of potential effects to aquatic species or their habitat among alternatives.

There are many past, ongoing, and reasonably foreseeable projects identified on the Lassen National Forest that may be ground-disturbing and could add sediment or other pollutants to surface waters within the forest. Wildfires are unforeseeable events that may directly impair water quality until vegetation recovers. The Lassen National Forest uses BMPs in compliance with the Clean Water Act to minimize water quality impacts. Projects whose BMP monitoring show results that are not effective are addressed and improved. Because there is a low risk of direct and indirect effects, the risks of cumulative effects from these alternatives are negligible.

As a result of recommended minimum snow depths and avoidance of resource damage standards to the underlying ground for cross-country use, depending on alternative (see table 178), there would continue to be only incidental ground disturbance. As a result, there would be no change to equivalent roaded acres calculations for any watersheds under these alternatives, and no change in detrimental cumulative watershed effects (see Hydrology section). There would be negligible effects from exhaust emissions stored in snowpack, low risk of damage to vegetation or aquatic habitat, and other direct and indirect effects. Alternatives 2 through 5 would implement the recommended project design criteria or mitigation measures. These alternatives would have adequate snow cover to protect soils, water, vegetation and aquatic habitats to prevent resource damage. These alternatives would not directly conflict with LRMP standards and guidelines, and would not result in irreversible or irretrievable effects to soil, water, or vegetation of aquatic resources.

Additionally, a changing climate may result in less high mountain meadow habitat and more frequent droughts in the Sierras, decreasing the quantity and quality of aquatic habitat depending on many factors (for example, year, season, location). This could cumulatively contribute to the direct and indirect effects to aquatic species by decreasing suitable habitat and stressing existing populations. However, it is impossible to quantify changes in habitat or populations in the aquatic analysis area, due to the uncertainty of exactly where, what, and when climatic changes could occur at the scale of the project area.

Threatened and Endangered Species

The effects of present and future projects on threatened and endangered species would likely be minimal because all projects are analyzed and mitigation measures are designed for those species for which viability is a concern, on a project-by-project basis.

Alternatives Comparison

For all alternatives, including the no-action alternative, OSV use would be designated in the project area. A comparison of alternatives based on trails and areas designated for OSV use, and minimum snow depth for OSV use on trails and cross country is shown in table 178. Effects common to all alternatives from OSV use are outlined earlier in this section and include effects to aquatic species and their habitat from OSV exhaust and lubricants, and snow compaction and trampling of vegetation from OSV tracks.

Table 178. Summary comparing current OSV management with the modified proposed action for minimum snow depth (in inches) and OSV trail grooming season on the Lassen National Forest

OSV Management	Alternative 1 Current Management (no action)	Alternative 2 (Proposed Action)	Alternative 3	Alternative 4	Alternative 5
National Forest System (NFS) Lands within the Lassen National Forest (acres)	1,150,020	1,150,020	1,150,020	1,150,020	1,150,020
OSV Use designated:					
Designated OSV Areas (Acres)	964,030	920,260	833,280	955,470	632,400
Approx. Percentage of NFS Land Area Designated (Designated in Alternatives 2 and 3) for Cross-country OSV Use	83.8%	80.1%	72.6%	83.4%	55%
Minimum Snow Depth for Public OSV Use on Snow Trails (Inches)	No minimum	6 inches on snow trails overlying roads and trails 12 inches on trail not overlying roads or trails	6 inches where site review determines there would be no damage to underlying resources	Depth necessary to avoid resource damage	12
Minimum Snow Depth for Snow Trail Grooming to Occur (Inches)	12	12*	18	12	12
OSV Trail Grooming Season	12/26 – 3/31	12/26 – 3/31	12/26 – 3/31	12/26 – 3/31	12/26 – 3/31

*The originally scoped proposed action has been modified to be consistent with the state grooming standard which states, "Begin grooming when the snow depth is at least 12 to 18 inches" (California OSV Program Final EIR, page 2-12).

Table 179. Alternatives comparison of potential effects to Sierra Nevada yellow-legged frog critical habitat

Sierra Nevada yellow-legged frog	Alternative 1 (no action)	Alternative 2 (Proposed Action)	Alternative 3	Alternative 4	Alternative 5
OSV trails crossing Sierra Nevada yellow-legged frog critical habitat	0	0	f0	0	0
Critical habitat within areas designated for cross-country OSV use (acres)	896.0	896.0	896.0	896.0	771.8

Table 180. Alternatives comparison of potential effects to Central Valley Steelhead and Central Valley spring-run Chinook critical habitat

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Notes
Chinook critical habitat						
Critical habitat within areas designated for cross country OSV use (miles)	18.34	9.64	9.63	13.43	0.85	A total of 51.89 miles of critical habitat are within the Lassen National Forest
Number of crossings with a designated OSV trail	0	0	0	0		
Steelhead critical habitat						
Critical habitat within areas designated for cross country OSV use (miles)	22.73 (19.13 Morgan Summit, 3.6 mi Jonesville)	13.14 (Morgan Summit)	12.50 (Morgan Summit)	17.8 (Morgan Summit)	3.3 (Morgan Summit)	A total of 62.9 miles of critical habitat are within the Lassen National Forest
Number of crossings with a designated OSV trail	2	1	1 (upstream of crossing not designated for OSV use for Alt 3)	2	2	First crossing located at intersection of road 29N48 with Rock Gulch Cr. Second crossing located at intersection road 31N17 with Panther Cr. below Dry Lake.

Alternative 1 – No Action

The no-action alternative is required by the NEPA and serves as a baseline to compare effects of action alternatives. Under alternative 1, there would be no changes to the existing system of OSV use on trails and areas within the Lassen National Forest except as prohibited by forest order. In addition, only those seasonal restrictions as specified in the Lassen LRMP and contained in existing forest orders would be continued.

Current management would continue in accordance with the Lassen's Forest Plan.

- The no-action alternative does not meet the purpose and need of complying with the Forest Service 2005 Travel Management Rule's Subpart C procedures.

The following summarizes how the Forest Service currently manages OSV use on the approximately 1,150,020-acre Lassen National Forest:

- Approximately 964,030 acres of National Forest System land open to off-trail cross-country OSV use;
- Minimum snow depth for public OSV use on snow trails is: no minimum;
- Minimum snow depth for OSV snow trail grooming is 12 inches; and
- Minimum snow depth for off-trail, cross-country OSV use is: no minimum.

Alternative 2 – Proposed Action

The proposed action is similar to the current use in terms of effects to aquatic resources. It restricts OSV use to 920,260 acres of NFS lands on Lassen National Forest, and recommends at least 6 inches of snow on OSV trails that allow access to trails, with more snow at higher elevations. It requires a 12-inch snow cover minimum for cross-country OSV use, and 12-inch snow cover before trail grooming can occur.

Alternative 3

Alternative 3 is similar to alternative 2 in terms of effects to aquatic resources. It restricts OSV use to 833,280 acres of NFS lands on Lassen National Forest, and recommends at least 6 inches of snow on OSV trails that allow access to trails, with more snow at higher elevations. It requires a 12-inch snow cover minimum for cross-country OSV use, and 18-inch snow cover before trail grooming can occur.

Alternative 4

Alternative 4 restricts OSV use to 955,470 acres of NFS lands on Lassen National Forest, and recommends a minimum snow depth necessary to avoid resource damage on OSV designated trails. It calls for a "depth necessary to avoid resource damage" minimum for cross-country OSV use and 12-inch snow cover before trail grooming can occur.

Alternative 5

Alternative 5 restricts OSV use to 632,400 acres of NFS lands on Lassen National Forest,, and recommends a 12-inch minimum snow depth on OSV designated trails. It calls for a 12-inch snow cover minimum for cross-country OSV use, and 12-inch snow cover before trail grooming can occur.

Effects to Aquatic Resources

Alternative 1

There are no additional effects to aquatic resources beyond those described in Effect Common to All Alternatives that are specific to alternative 1. This alternative would generally have the greatest potential for direct effects to aquatic resources due to larger areas of designated OSV use.

Alternatives 2, 3, 4 and 5

The effects of alternatives 2, 3, 4, and 5 are similar to alternative 1, except for slightly lower number of acres designated for OSVs, and the snow depth requirement for use of OSV trails. Approximately 920,260 acres, 833,280 acres, 955,470, and 632,400 acres of NFS lands on Lassen National Forest

(table 178) are designated for OSV use for alternatives 2, 3, 4 and 5, respectively. Because direct and indirect effects of this alternative are negligible, having less acreage designated for OSVs would lead to a minimal increase in direct or indirect effects on aquatic species or their habitat.

Threatened and Endangered Species

As described above in Effects Common to All Alternatives, there would be less than significant direct and indirect effects to *O. tshawytscha*, *O. mykiss* and *Rana sierrae* or their critical habitats.

Summary of Environmental Effects

Table 181. Summary comparison of potential environmental effects to aquatic resources

Resource Element	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Threatened and Endangered Fish Species (based on table 180)	Greater potential for effects (issue sufficiently addressed – minor potential effects)	Greater potential than 3, 5 and less than 1 and 4	Greater potential than 5 and less than 1,2, and 4	Greater potential than 2,3,5 and less than 1	Least potential for effects
Threatened and Endangered Aquatic Species (based on table 179)	Greater potential for effects (issue sufficiently addressed – minor potential effects)	Greater potential than 5 and equal to 1,3, and 4	Greater potential than 5 and equal to 1, 2, and 4	Greater potential than 5 and equal to 1, 2, and 3	Least potential for effects
Sensitive Species (Cascade frog)	Greater potential for effects	Greater than 3, 5 and less than 4 or 1	Greater than 5 and less than 1,2 ,and 4	Greater than 2,3, 5 and less than 1	Least potential for effects
Sensitive Species (Black Juga)	Greater potential for effects	Greater than 3, 5 and less than 4 or 1	Greater than 5 and less than 1,2 ,and 4	Greater than 2,3, 5 and less than 1	Least potential for effects

Threatened and Endangered Aquatic Species Determinations

Central Valley spring-run Chinook (Oncorhynchus tshawytsha)

Although occurrences for *O. tshawytscha* are located within the Lassen National Forest OSV Designation project area, proposed activities are not expected to directly affect *O. tshawytscha* because occurrence of *O. tshawytscha* are located in water or open water areas that are prohibited from OSV use.

Direct effects to *O. tshawytscha* from OSV use on designated trails would not occur because there are no crossings of Chinook-occupied streams with designated OSV trails under any of the alternatives.

Indirect effects to *O. tshawytscha* from cross-country OSV use are expected to be minimal because of implementation of a required minimum snow depth, the dispersed nature of cross-country OSV use, and the conclusions of the hydrology analysis that little change is expected to soils, vegetation, or hydrology of aquatic habitats.

Therefore, the Lassen National Forest OSV Designation project may affect, not likely to adversely affect *O. tshawytscha*.

Central Valley spring-run Chinook Critical Habitat

No direct effects to *O. tshawytscha* critical habitat from OSV use on designated trails would occur because there are no crossings of Chinook critical habitat with designated OSV trails under any of the alternatives.

Potential direct or indirect effects to *O. tshawytscha* critical habitat from cross-country OSV use are expected to be minimal because of implementation of a required minimum snow depth, the dispersed nature of cross-country OSV use, and the conclusions of the hydrology analysis that little change is expected to soils, vegetation, or hydrology of aquatic habitats.

Therefore, the Lassen National Forest OSV Designation project may affect, not likely to adversely affect *O. tshawytscha* critical habitat.

Central Valley steelhead (Oncorhynchus (=salmo) mykiss)

Although occurrences for *O. mykiss* are located within the Lassen National Forest OSV Designation project area, proposed activities are not expected to directly affect *O. mykiss* because occurrences of *O. mykiss* are located in water or open water areas that are prohibited from OSV use.

Potential indirect effects to *O. mykiss* from cross-country OSV use are expected to be minimal because of implementation of a required minimum snow depth, the dispersed nature of cross-country OSV use, and the conclusions of the hydrology analysis that little change is expected to soils, vegetation, or hydrology of aquatic habitats.

Therefore, the Lassen National Forest OSV Designation project may affect, not likely to adversely affect *O. mykiss*.

Central Valley steelhead Critical Habitat

Direct effects to *O. mykiss* critical habitat from OSV use on designated trails is expected to be minimal because there are only two crossings of steelhead critical habitat with designated OSV trails under any of the alternatives.

Direct or indirect effects to *O. mykiss* critical habitat from cross-country OSV use are expected to be minimal because of implementation of a required minimum snow depth, the dispersed nature of cross country OSV use, and the conclusions of the hydrology analysis that little change is expected to soils, vegetation, or hydrology of aquatic habitats.

Therefore, the Lassen National Forest OSV Designation project may affect, not likely to adversely affect *O. mykiss* critical habitat.

Sierra Nevada yellow-legged frog

The Lassen National Forest OSV Use Designation project may affect, not likely to adversely affect *R. sierrae.* Though historical occurrences have been documented, surveys have shown no known extant populations exist on the Lassen National Forest. The only (remnant) population of the species last discovered on the forest was in a remote lake (Oliver) and associated pond in 2005, in the Mill Ranch Creek 6th field subwatershed. Three subsequent surveys conducted by the California Department of Fish and Wildlife had no positive detections, thus the population is believed to be extirpated.

Sierra Nevada yellow-legged frog critical habitat

The Lassen National Forest OSV Use Designation project may affect, not likely to adversely affect critical habitat of *R. sierrae.* This determination is based upon conclusions of the aquatics analysis that direct or indirect effects to habitat from cross-country OSV use are expected to be minimal because of implementation of a required minimum snow depth, the dispersed nature of cross-country OSV use, and the conclusions of the hydrology analysis that little change is expected to soils, vegetation, or hydrology of aquatic habitats.

Sensitive Species Determinations

Cascades Frog

Because *Rana cascadae* are not active and/or present during the period of OSV use, the species would not be directly affected. Potential indirect effects are expected to be minor, and all effects would be minimized by the required minimum snow depths proposed. OSV use is not expected to result in a trend toward Federal listing or loss of viability for *Rana cascadae*. Therefore, t the Lassen OSV Designation project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the project area.

Black Juga

Direct impacts to *Juga nigrina* would be extremely rare, as OSVs would have to travel through open water (prohibited from OSV use) to harm the species. Due to the rarity of this occurring, the direct impacts are considered less than significant. Potential indirect effects are undetectable and unlikely to affect the species or alter its habitat, as described above. With slight direct or indirect effects expected, there would be no cumulative effects to this species. The Lassen National Forest OSV Use Designation project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the project area.

Compliance with LRMP and Other Relevant Laws, Regulations, Policies and Plans

With the biological evaluation/biological assessment (project record), the proposed project effects on TESP aquatic species have been evaluated and measures taken to ensure that sensitive species do not become threatened or endangered because of Forest Service actions.

All alternatives would maintain viable populations of all native and desired nonnative species and would be compliant with Forest Service Manual direction. All alternatives would also comply with the Lassen National Forest Land and Resource Management Plan (LRMP) and the Sierra Nevada Forest Plan Amendment because sensitive aquatic species populations would remain viable and their habitats would be maintained.

Chapter 4. Preparers and Contributors

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and other organization and individuals during the development of this environmental impact statement:

Preparers

Name	Title/Discipline	Relevant Experience	Education
Chris Bielecki	Logging Engineer, FS Enterprise Program	16 years in transportation engineering with the U.S. Forest Service	BS, Forestry MF, Forest Engineering
Ann Braun	Content Analyst, FS Enterprise Program	3 years content analysis with TEAMS,12 years information and data analysis, and 10 years Acquisition Management with the U.S. Forest Service	Undergraduate Education in General Studies, and Communication
Tracie Buhl	Fire Management Specialist, FS Enterprise Program	17 years in Fire Management/Natural Resources with the U.S. Forest Service. Seven years conducting air analyses	Undergraduate education in Natural Resources, Fire Science
Tricia Burgoyne	Soil Scientist, FS Enterprise Program	8 years' experience working as a soil scientist for the U.S. Forest Service	BS, Forest Ecology and Management
Bruce Davidson	Botanist, FS Enterprise Program	24 years botany and natural resource management with the U.S. Forest Service and USDI-BLM	BS, Botany
Vickey Eubank	GIS Support Specialist and Project Record, FS Enterprise Program	24 years in GIS management with the U.S. Forest Service	Applied Associate Degree in Science and Business
Linn Gassaway	Heritage Program Manager/Forest Archaeologist, Lassen National Forest		
Patricia Goude	Writer-Editor, FS Enterprise Program	8 years as a writer-editor with the U.S. Forest Service	BA, Technical Journalism
Delilah Jaworski	Social Scientist, FS Enterprise Program	7 years conducting social and economic analyses for the U.S. Forest Service and other Federal land management agencies	MSc, Environment and Development
Steve Kozlowski	Wildlife Biologist, FS Enterprise Program	18 Years as a Wildlife Biologist with the U.S. Forest Service	BS, Wildlife Biology

Name	Title/Discipline	Relevant Experience	Education
Patti Krueger	Regional Threatened and Endangered Species Coordinator	23 years with the Forest Service, 2 years with the Army Corps of Engineers	MS, Biological Sciences BS, Zoology
Bart Lander	Interdisciplinary Team Leader, FS Enterprise Program	14 years leading NEPA interdisciplinary teams with the U.S. Forest Service	BS, Forestry MS, Urban and Regional Planning PhD, Forest Policy and Economics
Katherine Malengo	Wildlife Biologist, FS Enterprise Program	5 years working on U.S. Forest Service interdisciplinary teams as a journey-level biologist	BS, Conservation Biology
Mike McNamara	Hydrologist, FS Enterprise Program	25 years' experience as a U.S. Forest Service Hydrologist	BS, Geology MS, Forest Hydrology
Doug Middlebrook	Wildlife Biologist, FS Enterprise Program	19 years conducting NEPA analysis with the U.S. Forest Service	BS, Wildlife Biology
Anthony Olegario	Fisheries Biologist, FS Enterprise Program	15 years as a U.S. Forest Service Fisheries Biologist	BS, Mechanical Engineering MS, Fisheries Science
Nikki Sandhoff	Economist, FS Enterprise Program	1 year experience in economics with the U.S. Forest Service	MA, Economics
Shannon Smith	Project Manager, Project Liaison Officer-Biological Scientist, FS Enterprise Program	16 years of U.S. Forest Service experience: Cultural Resources-NEPA Project, and Program Management	BA, Anthropology and Geology, MA, Anthropology/Archaeology
Kristi Swisher	Project Manager	26 years as Project Manager, Environmental Specialist, and Wildlife Biologist for FS, FWS, BOR, and FHWA	BS, Zoology
Stephanie Valentine	Outdoor Recreation Planner, FS Enterprise Program	18 years serving as an Outdoor Recreation Planner for Federal agencies, 6 years with the U.S. Forest Service	BS, Outdoor Recreation Management
Beth Ann Waterston	Content Analyst, FS Enterprise Program	15 years in forestry and silviculture with the U.S. Forest Service	BS, Natural Resource Sciences
Cindy White	Public Affairs Specialist, FS Enterprise Program	27 years in public affairs with the U.S. Forest Service	
Frank Yurczyk	Logging Engineer, FS Enterprise Program		

Interdisciplinary Team Consultants

Name	Title	Affiliation
Kim Earll	Forest Environmental Coordinator	Lassen National Forest
Melanie McFarland	Fisheries Biologist	Lassen National Forest
Esther Miranda-Cole	Public Affairs Specialist	Lassen National Forest
Chris O'Brien	Ecosystems and Public Services Staff Officer	Lassen National Forest
Heidi Perry	Public Affairs Officer	Lassen National Forest
Doug Peters	Forest Soils Scientist	Lassen National Forest
Priscilla Peterson	Forest Resource Information (GIS) Specialist	Lassen National Forest
Allison Sanger	Forest Botanist	Lassen National Forest
Carol Thornton	Forest Hydrologist	Lassen National Forest
Suraj Ahuja	N. California Air Quality Specialist	NFS Region 5
Virginia Emly	Regional Geospatial Data Manager	NFS Region 5
Laura Hierholzer	Regional NEPA Coordinator	NFS Region 5
Patti Krueger	Regional Threatened and Endangered Species Coordinator	NFS Region 5
Kathleen E. Mick	Program Manager, Trails Motorized Recreation Travel Management	NFS Region 5
Garrett Villanueva	Regional Trail Program Manager	NFS Region 5

Individuals, Groups and Agencies Consulted

The following individuals, groups, agencies, and email addresses were either contacted directly in the scoping process, or made themselves known to the Forest Service by submitting comments during scoping for the Lassen OSV Designation analysis.

Last Name or Organization	First Name	Organization Representing
Amador	Don	Blue Ribbon Coalition
American Council of Snowmobile Associations		
Andrews	Robert	
Atterbury	Ken	Sierra Club--Yahi Group
Augustine	Justin	Center For Biological Diversity
Ayers	Guy	
Bales	Stan	Recreation Planner, BLM
Brun	D.	
Bungard	James	
Butler	Kevin	
Butler	Marla	
Carrico	Galen	
Casey	Jamie	
Chandler	Scott	
Chicoine	Joe	Sno Riders, Inc.
Condreva	Ken	

Last Name or Organization	First Name	Organization Representing
Crump	Mike	Butte County
Dawes	Kerry	
Dawson	Mike	Director of Trail Operations, Pacific Crest Trail Association
Domish	Dorothy	
Dowdy	Judy	
Dyson	Mike	
Eisen	Hilary	Winter Wildlands Alliance
Erdoes	Jeff	
Felker	Kyle	Sierra Access Coalition
Ferris	Charles	Snowlands Network
Flint	Alison	Wilderness Society
Ford	Arlene	
Gaither	Tom	Lake Almanor Snowmobile Club
Gault	Michelle	Mayor Pro Tem, City of Portola
Giacomini	Pam	Shasta County Supervisor
Gibson	Jim	
Gould	Carl	
Hanson	Lorraine	Snowmobile Club
Hennion	Andrew	
Holabird	Tim	Representing U.S. Congressman Doug LaMalfa
Hotz	Charlie	
Intermountain News		
International Snowmobile Manufacturers Association		
Johnson	Glyne	California State Parks OHV
Jones	Scott	Off-Road Business Association, Inc.
Jury	Darrel	Environmental Studies Department, Feather River College
Keown	Linda	Redding Snow Riders
Keown	Ron	Redding Snow Riders, Inc., Ashpan Snowcat
Knutsen	Dale	
Kooyman	Justin	Pacific Crest Trail Association
Lassen County Times		
Lazzarino	Corky	Sierra Access Coalition
Leflore	Rick	California State Parks, Sacramento, CA
Lister	James H., Esq.	Birch Horton Bittner & Cherot, P.C.
Long	Kelly	State of California Department of Parks and Recreation
Martin	Jennifer	
Mecham	Jeff	
Milligan	Sylvia	Recreation Outdoor Coalition
Moore	Sean	Tehama County CC
Munson	James	Environmental Protection Agency, Region IX

Last Name or Organization	First Name	Organization Representing
Norton	Elizabeth	
Obrien-Feeney	Cailin	Winter Wildlands Alliance
Perreault	Bob	PCCC
Peters	Sarah	Wild Earth Guardians
Puterbaugh	Patricia	Lassen Forest Preservation Group, Sierra Forest Legacy, Yahi Group Sierra Club
Quijada	David	California State Parks
Rathje	Joel	Trails Coordinator, Lassen County
Reed	R.	
Repanich	Nick	Philbrook Community Association
Rowen	Bob	Snowlands Network/Winter Wildlands Alliance
Saxton	Trent, D.C.,M.E.	
Stanley	Jeremiah	
Stanton	Bob	Redding Sno-riders
Story	Frank	Bucks Lake Snowdrifters
Sutherland	Michael	
Szumel	Leo	
Teeter	Doug	Butte County Board Of Supervisors
Thrall	Sherrie	Plumas County Supervisor, PCCC
Trenda	Thomas	
Turnquist	Catherine	
Van Eperen	George	
Vanni	Anna	
Wagner	Bob	
Wagner	M.	
Wilson	Jeremy	Friends of the High Lakes
Wing	Ed	Lake Almanor Snowmobile Club
Wosick	Larry	Lassen County Supervisor

Email Addresses

The following email addresses may include email pseudonyms of individuals, groups, and agencies on the previous list.

advincent@frontiernet.net
almanorlov ers@aol.com
babymud@frontiernet.net
battchief_23@sbcglobal.net
bethvienneau@yahoo.com
bettyoverstreet@hotmail.com
beverlywilcox29@yahoo.com
bikerdude1614@msn.com
bjencor@aol.com
brinkwoman_@hotmail.com
cappelen@ponderosaca.com
catnjer@frontiernet.net
cbayley40@hotmail.com
cdeurloo@frontiernet.net
cedarlodge@frontiernet.net
chesternews@plumasnews.com
Cijones@buttecounty.net
crawdad66@hotmail.com
cwittner@ci.redding.ca.us
debinpa@hotmail.com
delbate@yahoo.com
dgarton@co.tehama.ca.us
director@lassencountychamber.org
dmason@thegrid.net
dmschmidt@co.lassen.ca.us
dngknut@frontiernet.net
doctorpitch@yahoo.com
drudgers@frontiernet.net
dskag5@aol.com
egwing@frontiernet.net
ers2u@sbcglobal.net
fgallegos@pistenbullyusa.com
frollins@frontiernet.net
gaitherkrystal@yahoo.com
glitterandgrins@hotmail.com
greg@kellerlumbersales.com
gretchenjehle@yahoo.com
haynes034@att.net
henise@frontiernet.net
herango@citlink.net
herbieatthelake@frontiernet.net
janbill@frontiernet.net
jandraf@frontiernet.net
jayrdobler@yahoo.com
jefferdoes@att.net
jntpleau@frontiernet.net
jonnsummer@sbcglobal.net
joscelyn@citlink.net
kathy@thedonleys.net
kblubar@aol.com
kevin@krbengineering.com
kimjames@lakealmanorarea.com
ktmoriarty22@gmail.com
Larryorland@yahoo.com
Lsroe@msn.com
mail@plumasnews.com
michael@bamco.com
miketm9@gmail.com
mmkeller@frontiernet.net
mtecho@shasta.com
mtnxtreme1@gmail.com
mvdefehr@charter.net
nataquanews@digitalpath.net
outdoors770@yahoo.com
pcbs@countyofplumas.com
pinegate2@frontiernet.net
pmroarty@frontiernet.net
pnwgarrido@frontiernet.net
prisden@frontiernet.net
rae4travl@gmail.com
randbcar@citlink.net
rbs.masonry@frontiernet.net
rcesarin@frontiernet.net
rdk7@frontier.com
reddingsnowsports@yahoo.com
richross@frontiernet.net
rojanat@msn.com
rstanton@snydercapital.com
rueben.mahnke@lassenhigh.org
scott@duncanplumbing.us
shbertotti@yahoo.com
slspeer@windjammercable.net
smokemyochum@yahoo.com
snowlovers@roadrunner.com
swimsp@comcast.net
tadkins@mjbwelding.com
tchasingfish@sbcglobal.net
tharp@parks.ca.gov
thewebs@frontiernet.net
tjohns@pcso.net
tjremitz@aol.com
triplecbill@yahoo.com
usmcindian@yahoo.com
vdgus@yahoo.com
vickieg5@yahoo.com
vjgmj@aol.com
wealward@gmail.com
ypiokya@frontiernet.net
zigmansmom@yahoo.com

Distribution of the Environmental Impact Statement

This revised final environmental impact statement has been distributed to individuals who specifically requested a copy of the document. In addition, copies have been sent to the following Federal agencies, federally recognized Tribes, State and local governments, and organizations representing a wide range of views.

References Cited

Monitoring

Lieske, Patrick D. and T. Frollie. 2010. Over snow vehicle (OSV) Snow Program Monitoring Report. Report on file. Lassen National Forest.

Adequacy of Snow Depth

Effects of Winter Recreation on Subnivean Fauna. 1999. In Effects of Winter Recreation on Wildlife of the Greater Yellowstone Area: A Literature Review and Assessment. Ollif, T., Legg, K. and B. Kaeding. Greater Yellowstone Coordinating Committee, Yellowstone National Park.

Effects of Snowmobile Traffic on Non-Forest Vegetation and Grasses. 1974. Proceedings of the 1973 Snowmobile and Off the Road Vehicle Symposium; Michigan State University, East Lansing, MI.

Wildlife Resource Consultants. 2004. Winter Recreation Effects on the Subnivean Environment of Five Sierra Nevada Meadows. US Forest Service, Lake Tahoe Basin Management Unit.

Trujillo, E. and N.P. Molotch. 2014. Snowpack regimes of the Western United States. Water Resources Research 50(7): 5611-5623.

Recreation Resources

Adams, John C. and Stephen F. McCool. 2010. Finite Recreation Opportunities: The Forest Service, the Bureau of Land Management, and Off-Road Vehicle Management. Natural Resources Journal. Vol. 49.

California Department of Parks and Recreation. Off Highway Motor Vehicle Recreation Division. 2010. Over Snow Vehicle Program. Final Environmental Impact Report Program Years 2010 – 2020. State Clearinghouse # 2009042113. December 2010.

Code of Federal Regulations. 36 CFR Part 212. Travel Management Regulations

Code of Federal Regulations. 36 CFR Part 294. Roadless Area Conservation. Final Rule.

Gorte, R.W. 2011. Wilderness Laws: Statutory Provisions and Prohibited and Permitted Uses. Congressional Research Service.

Kelson, A.R. and R.J. Lilieholm. 1999. Transboundary Issues in Wilderness Management. Environmental Management. Vol. 23. No 3. P 297-305.

O'Brien, C. 2015. Personal communication with Public Service Staff Officer, Lassen National Forest.

Rolloff, D.B., E.Erickson, and B. Niles. 2009. California Department of Parks and Recreation. Off-Highway Motor Vehicle Recreation Division. 2009 Winter Trailhead Survey. Dept. of Recreation, Parks, and Tourism Administration. College of Health and Human Services. California State University, Sacramento.

Snowlands Network. 2014. Analyzing Snowmobile Impacts to Other Winter Recreation Users in the Sierra Nevada and Southern Cascades. December 2014.

USDA Forest Service. 1982. Comprehensive Management Plan for the Pacific Crest National Scenic Trail. Pacific Northwest Region, Portland, OR.

USDA Forest Service. 1992. Pacific Southwest Region Lassen National Forest. Land and Resource Management Plan.

USDA Forest Service. 2001. Pacific Southwest Region. Sierra Nevada Forest plan amendment: final environmental impact statement. Vallejo, CA. http://www.fs.fed.us/r5/snfpa/library/archives/feis/index.htm.

USDA Forest Service. 2006. Natural Resource Manager. National Visitor Use Monitoring Program. Visitor Use Report. Lassen National Forest. Data collected FY 2005.

USDA Forest Service. 2007. Recreation niche statement. On file at USDA Forest Service, Lassen National Forest, Supervisor‘s Office, 2550 Riverside Drive, Susanville, CA 96130.

USDA Forest Service. 2009. Final Environmental Impact Statement. Motorized Travel Management. Lassen National Forest. Butte, Lassen, Modoc, Plumas, Shasta, Tehama and Siskiyou Counties, California. Pacific Southwest Region. R5-MB-207.

USDA Forest Service. 2010. Natural Resource Manager. National Visitor Use Monitoring Program. Visitor Use Report. Lassen National Forest. Data Collected in 2010.

USDA Forest Service. 2012. National Best Management Practices for Water Quality Management on National Forest System Lands. FS-990a.

USDA Forest Service. 2014. Lassen National Forest. Region 5 Five-Forest Over Snow Vehicle Program NEPA Project. Need for Change and Proposed Action Worksheet.

USDA Forest Service. 2015. Natural Resource Manager. National Visitor Use Monitoring Program. Visitor Use Report. Lassen National Forest. Data Collected in 2015.

USDI National Park Service website. http://www.nps.gov/lavo/planyourvisit/winter_activities.htm. Accessed November 4, 2015.

Transportation Resources

California Department of Parks and Recreation. Off Highway Motor Vehicle Recreation Division. 2010. Over Snow Vehicle Program. Final Environmental Impact Report Program Years 2010 – 2020. State Clearinghouse # 2009042113. December 2010.

CA. 2012. Off-Highway Vehicle Law Enforcement Information (Quickbook). California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, Sacramento, CA.

USDA Forest Service. 1992. Lassen National Forest Land and Resource Management Plan. USDA Forest Service, Lassen National Forest, Susanville, CA.

USDA Forest Service. 2014. Forest Service Directive System, Forest Service Manuals and Handbooks, 7700 Series: Travel Management. USDA Forest Service. Available: http://www.fs.fed.us/im/directives/, accessed March 14, 2014.

USDA Forest Service. 2015. Forest Service Directive System, Forest Service Manuals and Handbooks, 7700 Series: Travel Management. USDA Forest Service. Available at http://www.fs.fed.us/im/directives/, accessed October 31, 2015.

USDA Forest Service. 2015. Forest transportation atlas – GIS Spatial and INFRA Tabular Data, Lassen National Forest. USDA Forest Service, Lassen National Forest, Susanville, CA.

Noise

California Department of Parks and Recreation. Off Highway Motor Vehicle Recreation Division. 2010. Over Snow Vehicle Program. Final Environmental Impact Report Program Years 2010 – 2020. State Clearinghouse # 2009042113. December 2010.

Harrison, R.T., R.N. Clark, and G.H. Stankey. 1980. Predicting impact of noise on recreationists. ED&T Project No. 2688: Noise Pollution Prediction Method. USDA Forest Service, Equipment Development Center, San Dimas, CA.

USDA Forest Service. 2009. Pacific Southwest Region. Sierra Nevada Forest plan amendment: final environmental impact statement. Vallejo, CA. http://www.fs.fed.us/r5/snfpa/library/archives/feis/index.htm. May 2009.

Soils

Baker, E. and E. Buthmann. 2005. Snowmobiling in the Adirondack Park: Environmental and Social Impacts. St. Lawrence University, Department of Biology, Canton, New York.

Cacek, C.C. 1989. The relationship of mass wasting to timber harvest activities in the Lightning Creek basin. Master Thesis, Eastern Washington University. pp. ii-iv.

Gage, E. and D.J. Cooper. 2009. Winter recreation impacts to wetlands: a technical review. Report for Arapaho-Roosevelt National Forests, White River National Forest and Black Hills National Forest. Department of Forest, Rangeland and Watershed Stewardship. Colorado State University, Fort Collins, Colorado 80523.

Jurgensen, M.F., A.E. Harvey, R.T. Graham, D.S. Page-Dumrose, J.R. Tonn, M.J. Larson, and T.B. Jain. 1997. Impacts of timber harvests on soil organic matter, nitrogen, productivity and health of inland northwest forests. Forest Science 43: 234-251.

Keller, T., C. Pielmeier, C. Rixen, F. Gadient, D. Gustafsson, and M. Stahli. 2004. Impact of artificial snow and ski-slope grooming on snowpack properties and soil thermal regime in a sub-alpine ski area. Annals of Glaciology 38: 314-318.

Kliewer, G.F. 1994. Soil survey of the Lassen National Forest area, California. USDA Forest Service, Pacific Southwest Region.

Olliff, T., K. Legg, and B. Kaeding. 1999. Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment. Report to the Greater Yellowstone Coordinating Committee. Yellowstone National Park.

Page-Dumroese, D.S., M. Jurgensen, and T. Terry. 2010. Maintaining soil productivity during forest or biomass-to-energy thinning harvests in the Western United States. Western Journal of Applied Forestry 25 (1): 5-11.

State of California, Department of Water Resources. 2007. Climate change in California. http://www.water.ca.gov/climatechange/docs/062807factsheet.pdf.

USDA Forest Service and Soil Conservation Service. 1967. Soil Survey: Tehama County California. 130 pp.

USDA Forest Service. 1992. Lassen National Forest Land and Resource Management Plan. Susanville, California.

USDA Forest Service. 1995. Forest Service Handbook, R-5 Supplement 2509.18-95-1. Soil Management Handbook. San Francisco, California. 10 pp.

USDA Forest Service. 2006. Forest Service Handbook, R-2 2509.25-10. Watershed Conservation Practices Handbook; Management Measures and Design Criteria. Denver, Colorado. 29 pp.

USDA Forest Service. 2012. National Best Management Practices for Water Quality Management on National Forest System Lands. Volume 1: National Core BMP Technical Guide. FS-990a. 177 pp.

Air Quality

Air Resources Board. 2015. Annual Monitoring Network Report for Twenty Five District in California. June 2015, Volume 1. California Environmental Protection Agency. Air Resources Board

Bishop, G.A., D.A. Burgard, T.R. Dalton, and D.H. Stedman. 2006. In-use Emission Measurements of Snowmobiles and Snowcoaches in Yellowstone National Park. University of Denver, Department of Chemistry and BioChemistry. Denver, CO.

BRP. 2011. BRP SKI-DOO Snowmobiles: 10 Models BAT Certified for Yellowstone and Grand Teton National Parks. Valcourt, Quebec. www.brp.com

California Air Resources Board. 2015. California Ambient Air Quality Standards. Online at: http://www.arb.ca.gov/desig/desig.htm

California Department of Parks and Recreation. Off Highway Motor Vehicle Recreation Division. 1997. California Snowmobile Trail Grooming. State of California, Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, Sacramento, October 1997.

Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.). 2014. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Environmental Protection Agency (EPA). 2010. Exhaust Emission Factors for Non-road Engine modeling- Spark-Ignition NR-010f. Assessment of Standards Division, Office of Transportation and Air Quality. US. EPA.

Environmental Protection Agency. 2013. http://www.arb.ca.gov/ei/maps/statemap/dismap.htm

Environmental Protection Agency. 2015. AIR Data. Available online at: http://www.epa.gov/air/data/geosel.html

Environmental Protection Agency. 2015(3). Office of Transportation and Emission Standards for nearly all types of non-road engines, vehicles and equipment. FAQs.

Jehl, Douglas 2002. Air Pollution Regulations Extended to Snowmobiles. The New York Times. Available online at: http://www.nytimes.com/2002/09/14/us/air-pollution-regulations-extended-to-snowmobiles.html

Lopina, Cassie, Air Pollution Specialist, California Air Resources Board. Personal email communications. 2015.

Millner, J. 2015. Snowmobiles in Yellowstone National Park: An American right, or wrong? Geoscience Education Web Development Team, Montana State University.

Musselman, R.C. and J.L. Korfmacher. 2007. Air quality at a snowmobile staging area and snow chemistry on and off trail in a Rocky Mountain subalpine forest, Snowy Range, Wyoming.

Raap, Kim. 2014. Facts and Myths about Snowmobiling and Winter Trails. American Council of Snowmobile Associations.

Ray, J.D. 2005. Results from the Yellowstone National Park winter air quality study 2004–2005. USDI, National Park Service, Air Resources Division, Denver, CO. 64.241. 25.110/yell/pdfs/winteruse/winteraqstudy04–05.pdf.

Snow Goer Staff. 2006. 2006 Snowmobile Emissions. Snow Goer Magazine.

USDI NPS. 2000. Air quality concerns related to snowmobile usage in National Parks. USDI, National Park Service, Air Resources Division, Denver, CO. http://www2.nature. nps.gov/air/Pubs/pdf/yell/Snowmobile_Report.pdf).

USDI NPS. 2013. U.S. Department of the Interior, National Park Service. Yellowstone National Park Winter Use Plan. Supplemental Environmental Impact Statement. Wyoming, Montana, Idaho

USDA Forest Service. 1992. Lassen National Forest's Land and Resource Management Plan (LRMP). USDA-Forest Service, PSW Region, Lassen National Forest, California.

USDA Forest Service. 2018. Over-snow Vehicle Use Designation. Revised Final Environmental Impact Statement. Lassen National Forest, Susanville, CA.

U.S Government Publishing Office. 2015. Electronic Code of Federal Regulations. Accessed November 2015 at: http://www.ecfr.gov/cgi-bin/text-idx?SID=debdc659dece22de01aab5b6a8745c76&mc=true&node=se40.33.1051_1103&rgn=div8

Valentine, Stephanie. 2018. Five Forest Over Snow Vehicle, Lassen Recreation Report. USDA Forest Service. FS Enterprise Program.

Wakefield, Jeff. 2016. Snowmobiling could be hard hit by climate change, new study says. University of Vermont. Science News.

Wobus, Cameron; Small, Eric, Hosterman, Heather; Mills, David; Stein, Justin; Rissing, Matthew; Jones, Russell; Duckworth, Michael; Hall, Ronald; Kolian, Michael; Creason, Jared; Martinich, Jeremy. 2017. Projected climate change impacts on skiing and snowmobiling: A case study of the United States. Global Environmental Change, volume 45. P14.

Other Agencies and Individuals Consulted

Cassandra Lopina, Air Pollution Specialist, California Air Resources Board.

Jeremy Avise, Ph.D., Manager/Senior Air Quality Modeler, California Air Resources Board.

Socioeconomic Conditions

Allen, S.D., D.A. Wickwar, F.P. Clark, R.R. Dow, R. Potts, and S.A. Snyder. 2009. Values, Beliefs, and Attitudes Technical Guide for Forest Service Land and Resource Management, Planning, and Decisionmaking. General Technical Report PNW-GTR-788. U.S. Forest Service, Pacific Northwest Research Station: Portland, OR. 120 pp.

Switalski, Adam. 2014. Snowmobile Best Management Practices for Forest Service Travel Planning. Winter Wildlands Alliance: Boise, ID. 20 pp.

U.S. Census Bureau. 2015a. American Community Survey, 2009-2013 5-year Estimates. Accessed July 23, 2015 <http://factfinder.census.gov>.

U.S. Census Bureau. 2015b. County Business Patterns 2013. Accessed July 23, 2015 from EPS <http://www.headwaterseconomics.org/tools/economic-profile-system>.

U.S. Department of Agriculture, Economic Research Service (USDA ERS). 2013. Rural-Urban Continuum Codes. Accessed July 23, 2015 < http://www.ers.usda.gov/data-products/rural-urban-continuum-codes/.aspx>.

U.S. Department of Agriculture, Forest Service (USDA Forest Service). 2015a. Ecosystem Management Coordination, National Forest Recreation Economic Contributions. Accessed July 23, 2015 <http://www.fs.fed.us/emc/economics/recreation-contributions>.

U.S. Department of Agriculture, Forest Service (USDA Forest Service). 2015b. National Visitor Use Monitoring for the Lassen National Forest, Data Collected FY 2010. Accessed July 20, 2015 <http://www.fs.fed.us/recreation/programs/nvum/>.

White, E.M and D.J. Stynes. 2010. Updated Spending Profiles for National Forest Recreation Visitors by Activity. Accessed July 23, 2015 <http://www.fsl.orst.edu/lulcd/Publicationsalpha_files/White_Stynes_NVUM2010b.pdf>.

Hydrologic Resources

Adams, E.S. 1975: Effects of lead and hydrocarbons from snowmobile exhaust on brook trout (Salvelinus fontinalis). Trans Amer. Fisheries Soc. 104(2): 363-373.

Arnold, J.L., and T.M. Koel. 2006. Effects of Snowmobile Emissions on the Chemistry of Snowmelt Runoff in Yellowstone National Park. Yellowstone National Park, Center for Resources – Fisheries and Aquatic Sciences Section. http://www.nps.gov/yell/parkmgmt/upload/snwmbil_snwmlt_rpt.pdf

California Department of Parks and Recreation. 2010. Over-snow vehicle program final environmental impact report, program years 2010-2020. California Department of Parks and Recreation, Off-highway Motor Vehicle Recreation Division. 156 pp.

California Environmental Protection Agency, State Water Resources Control Board, Lahontan Regional Water Quality Control Board (California EPA LRWQCB 2010) website. 2010. https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

Hagemann, M., and M. Van Mouwerik. 1999. Potential water quality concerns related to snowmachine usage. Internal memo. USDI, National Park Service, Water Resources Division

Ingersoll, G.P. 1999. Effects of snowmobile use on snowpack chemistry in Yellowstone National Park, 1998. U.S. Geological Survey Water Resources Investigations Report 99-4148. 24 pp.

Jones, J.A. and G.E. Grant. 1996. Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon. Water Resources Research 32(4):959-974.

Keddy, P.A., A.J. Spavold, and C.J. Keddy. 1979: Snowmobile impact on old field and marsh vegetation in Nova Scotia, Canada: an experimental study. Environmental Management 3(5): 409-415.

McDaniel, M.R., and B.K. Zielinska, 2015: Polycyclic Aromatic Hydrocarbons in the Snowpack and Surface Water in Blackwood Canyon, Lake Tahoe, CA, as Related to Snowmobile Activity. Polycyclic Aromatic Compounds, 35(1), 102-119.

Neumann P.W., and H.G. Merriam. 1972: Ecological effects of snowmobiles. Canadian Field Naturalist, volume 86: 207-212.

Olliff, T., K. Legg, and B. Kaeding. 1999. Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment. Report to the Greater Yellowstone Coordinating Committee. Yellowstone National Park.

Snow Mobile Forum. 2008. Available online at http://www.snowmobileforum.com/general-sled-chat/25036-whats-minimum-amount-snow-you-should.html. Accessed 2015.

U.S. Army Corps of Engineers. 1987. Wetlands Delineation Manual. Wetlands Research Program Technical Report Y-87-1 (online edtion) by Environmental Laboratory.

U.S. Department of Agriculture Forest Service (USDA Forest Service). 2000. Water quality management for forest system lands in California: best management practices. Pacific Southwest Region, Vallejo, CA. 138 pp.

USDA Forest Service. 2001. Sierra Nevada Forest plan amendment: final environmental impact statement. Vallejo, CA. Available online at http://www.fs.fed.us/r5/snfpa/library/archives/feis/index.htm (accessed May 14, 2009).

USDA Forest Service. 2004. Sierra Nevada Forest plan amendment: final supplemental environmental impact statement; record of decision. Vallejo, CA. Available online at: http://www.fs.fed.us/r5/snfpa/final-seis/index.html (accessed May 14, 2009).

Ziemer, R.R. 1981. Storm flow response to road building and partial cutting in small streams of Northern California. Water Resources Research. 17(4): 907-917.

Listed and Sensitive Botanical Species

Arnold, J. L., and Koel, T. M. 2007. Effects of Snowmobile Emission on the Chemistry of Snowmelt Runoff in Yellowstone National Park. Final Report. Fisheries and Aquatic Sciences Section, Center for Resources, Yellowstone National Park, Wyoming. YCR-2006-1.

Bazzaz, F. A. and K. Garbutt. 1998. The Response of Annuals in Competitive Neighborhoods: Effects of Elevated CO2. Ecology 69(4): 937-946.

Blanchard, C., H. Michaels, A. Bradman, and J. Harte. 1988. Episodic Acidification of a Low-alkalinity Pond in Colorado. Energy and Resources Group, Berkeley, California. ERG-88-1. 15 p.

California Department of Fish and Game, California Natural Diversity Database (CDFG CNDDB). 2017. GIS rare plant and animal occurrence data available by subscription. Sacramento, California. (February 2017).

Davenport, J. and T. A. Switalski. 2006. Environmental impacts of transport related to tourism and leisure activities. Chapter 14 in J. Davenport and J. A. Davenport (eds.) The ecology of transportation: managing mobility for the environment. Springer, Dordrecht. Netherlands.

Davidson, B. 2017. Botany Specialist Report for Lassen OSV Designation project. Unpublished report. USDA Forest Service, Lassen National Forest, Susanville, California.

Eagleston, H. and C. Rubin. 2013. Non-motorized winter recreation impacts to snowmelt erosion, Tronsen Basin, Eastern Cascades, Washington. Environmental Management 51: 167-181.

Fahey, B. and K. Wardle. 1998. Likely impacts of snow grooming and related activities in the West Otago ski fields. Science for Conservation: 85. New Zealand Department of Conservation.

Falkengren-Grerup, U. 1986. Soil acidification and vegetation changes in deciduous forest in southern Sweden. Oecologia 70:339-347.

Gage, E. and D. J. Cooper. 2013. Evaluating snow compaction effects to fen wetlands on Rabbit Ears and Buffalo Pass of the Routt national Forest. Prepared for the Arapaho-Roosevelt National Forests, the White River National Forest, and the Black Hills National Forest.

Greller, A. M., Goldstein, M., Marcus, L. 1974. Snowmobile impact on three alpine tundra plant communities. Environmental Conservation 1(2): 101–110.

Ingersoll, G., J. Turk, C. McClure, S. Lawlor, D. Clow, and A. Mast. 1997. Snowpack chemistry as an indicator of pollutant emission levels from motorized winter vehicles in Yellowstone National Park, Proceedings of 65th Annual Meeting of Western Snow Conference, May 4-8, 1997, Banff, Alberta.

Ingersoll, G. 1998. Effects of snowmobile use on snowpack chemistry in Yellowstone National Park, USGS, Department of Interior, Water-Resources Investigation Report 99-4148.

Keddy, P. A., A. J. Spavold, and C. J. Keddy. 1979; Snowmobile Impact on Old Field and March Vegetation in Nova Scotia Canada: An Experimental Study. Environmental Management 3(5): 409-415.

McNamara, M. 2017. Hydrology Report for Lassen National Forest Over-Snow Vehicle Use Designation Final Environmental Impact Statement. Unpublished report. USDA Forest Service, Lassen National Forest, Susanville, California.

Mooney, H.A., M. Kueppers, G. Koch, J. Gorham, C. Chu, and W.E. Winner. 1988. Compensating effects to growth of carbon partitioning changes in response to SO2-induced photosynthetic reduction in radish. Oecologia, Vol. 75, No. 4, p. 502–506.

Musselman, R. C., and Korfmacher, J. L. 2007. Air quality at a snowmobile staging area and snow chemistry on and off trail in a Rocky Mountain subalpine forest, Snowy Range, Wyoming. Environmental monitoring and assessment 133(1-3), 321-334.

Neumann, P. W., and H. G. Merriam. 1972. Ecological effects of snowmobiles. Canadian Field Naturalist 86:207-212.

Sanger, A. 2010. Biological Assessment for Orcuttia tenuis and Tuctoria greenei for the Motorized Travel Management Project. Lassen National Forest. January 21, 2010.

Sanger, Allison (Lassen National Forest Botanist). 2015. Personal communications with Bruce Davidson, Botanist, US Forest Service TEAMS Enterprise Unit, between March and October, 2015.

Stangl, J. T. 1999. Effects of Winter Recreation on Vegetation. Pages 119-121 in Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment. Report to the Greater Yellowstone Coordinating Committee. Olliff, T., K. Legg, and B. Kaeding, editors. Yellowstone National Park, Wyoming. 315 p.

U.S. Department of Agriculture (USDA Forest Service). 1992. Lassen National Forest Land and Resource Management Plan. Lassen National Forest. Susanville, California.

USDA Forest Service. 1999. Executive Order 13112. Presidential Documents, Invasive Species, President William Clinton. Federal Register Vol. 64, No. 25, February 8, 1999.

USDA Forest Service. 2005. Forest Service Manual 2670-2671. Threatened, Endangered and Sensitive Plants and Animals. Chapter 2670. National Headquarters, Washington, DC. Effective: September 23, 2005.

USDA Forest Service. 2010. Summary of the Decision for Motorized Travel Management – Prohibition of Cross-country Travel and Route Designation. Lassen National Forest. Susanville, California. June, 2010.

USDA Forest Service. 2011. Forest Service Manual 2900 – Invasive Species Management. Chapter – Zero Code. National Headquarters, Washington DC. Effective: December 5, 2011.

USDA Forest Service. 2014. Use by Over-snow Vehicles (Travel Management Rule). Federal Register, June 18, 2014. 79(117): 34678-34681.

USDA Forest Service (USDA FS); USDI Bureau of Land Management (USDI BLM). 1989. Species management guide for Orcuttia tenuis. Unpublished document. On file with: USDA Forest Service, Lassen National Forest, Supervisor’s Office, 2550 Riverside Drive, Susanville, CA 96130.

USDA Forest Service (USDA FS); USDI Bureau of Land Management (USDI BLM). 2012. Conservation Strategy for Orcuttia tenuis on Federal Lands of the Southern Cascades and Modoc Plateau. Lassen National Forest, Susanville, CA; Modoc National Forest, Alturas, CA; and BLM Alturas Field Office, Alturas, CA.

USDI Fish and Wildlife Service (USFWS). 1997. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Three Plants and Threatened Status for Five Plants From Vernal Pools in the Central Valley of California. Federal Register, March 26, 1997. 62(58): 14338-14352.

USDI Fish and Wildlife Service (USFWS). 2003a. Recovery Plan for Fritillaria gentneri (Gentner's fritillary). U. S. Fish and Wildlife Service, Region 1. Portland, Oregon.

USDI Fish and Wildlife Service (USFWS). 2003b. Endangered and Threatened Wildlife and Plants: Final Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon; Final Rule. Federal Register, August 6, 2003. 68(151): 46683-46867.

USDI Fish and Wildlife Service (USFWS). 2005. Recovery plan for vernal pool ecosystems of California and Southern Oregon. Portland, OR. 606 p.

USDI Fish and Wildlife Service (USFWS). 2018a. Lassen National Forest Over-Snow Vehicle Use Designation Project Official Species List. Klamath Falls Fish and Wildlife Office. Klamath Falls, Oregon. February 20, 2018.

USDI Fish and Wildlife Service (USFWS). 2018b. Lassen National Forest Over-Snow Vehicle Use Designation Project Official Species List. Sacramento Fish and Wildlife Office. Sacramento, California. February 20, 2018.

USDI Fish and Wildlife Service (USFWS). 2018c. Lassen National Forest Over-Snow Vehicle Use Designation Project Official Species List. Yreka Fish and Wildlife Office. Yreka, California. February 20, 2018.

USDI Fish and Wildlife Service (USFWS). 2018d. Lassen National Forest Over-Snow Vehicle Use Designation Project Official Species List. Nevada Fish and Wildlife Office. Reno, Nevada. February 20, 2018.

Wanek, W.J. 1971. Snowmobile impacts on vegetation, temperatures, and soil microbes. Pp. 116–129 in Chubb, M (Ed.), Proceedings of the 1971 snowmobile and off-road vehicle research symposium, Michigan State University Department of Parks and Recreation Resources Technical Report No.8, Michigan State University, East Lansing.

Winner, W.E., and C.J. Atkison. 1986. Absorption of Air Pollution by Plants, and Consequences for Growth. Trends in Ecology and Evolution. Vol. 1, p. 15–18.

Winter Wildlands Alliance (WWA). 2009. Seeing the Forest and the Trees – Assessing Snowmobile Damage in National Forests. A Report by Winter Wildlands Alliance. November, 2009. 3p.

Other Botanical Species

Arnold, J. L., and Koel, T. M. 2007. Effects of Snowmobile Emission on the Chemistry of Snowmelt Runoff in Yellowstone National Park. Final Report. Fisheries and Aquatic Sciences Section, Center for Resources, Yellowstone National Park, Wyoming. YCR-2006-1.

Bazzaz, F. A. and K. Garbutt. 1998. The Response of Annuals in Competitive Neighborhoods: Effects of Elevated CO2. Ecology 69(4): 937-946.

Blanchard, C., H. Michaels, A. Bradman, and J. Harte. 1988. Episodic Acidification of a Low-alkalinity Pond in Colorado. Energy and Resources Group, Berkeley, California. ERG-88-1. 15 p.

California Department of Fish and Game, California Natural Diversity Database (CDFG CNDDB). 2017. GIS rare plant and animal occurrence data available by subscription. Sacramento, California. (February 2017).

Castellano, M.A., J.E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476.

Castellano, M.A., E. Cazares, B. Fondrick, and T. Dreisbach. 2003. Handbook to Additional Fungal Species of Special Concern in the Northwest Forest Plan. General Technical Report PNW-GTR-572.

Davenport, J. and T. A. Switalski. 2006. Environmental impacts of transport related to tourism and leisure activities. Chapter 14 in J. Davenport and J. A. Davenport (eds.) The ecology of transportation: managing mobility for the environment. Springer, Dordrecht. Netherlands.

Eagleston, H. and C. Rubin. 2013. Non-motorized winter recreation impacts to snowmelt erosion, Tronsen Basin, Eastern Cascades, Washington. Environmental Management 51: 167-181.

Fahey, B. and K. Wardle. 1998. Likely impacts of snow grooming and related activities in the West Otago ski fields. Science for Conservation: 85. New Zealand Department of Conservation.

Falkengren-Grerup, U. 1986. Soil acidification and vegetation changes in deciduous forest in southern Sweden. Oecologia 70:339-347.

Gage, E. and D. J. Cooper. 2013. Evaluating snow compaction effects to fen wetlands on Rabbit Ears and Buffalo Pass of the Routt national Forest. Prepared for the Arapaho-Roosevelt National Forests, the White River National Forest, and the Black Hills National Forest.

Greller, A. M., Goldstein, M., Marcus, L. 1974. Snowmobile impact on three alpine tundra plant communities. Environmental Conservation 1(2): 101–110.

Ingersoll, G., J. Turk, C. McClure, S. Lawlor, D. Clow, and A. Mast. 1997. Snowpack chemistry as an indicator of pollutant emission levels from motorized winter vehicles in Yellowstone National Park, Proceedings of 65th Annual Meeting of Western Snow Conference, May 4-8, 1997, Banff, Alberta.

Ingersoll, G. 1998. Effects of snowmobile use on snowpack chemistry in Yellowstone National Park, USGS, Department of Interior, Water-Resources Investigation Report 99-4148.

Keddy, P.A., A.J. Spavold, and C.J. Keddy. 1979; Snowmobile Impact on Old Field and March Vegetation in Nova Scotia Canada: An Experimental Study. Environmental Management 3(5): 409-415.

McNamara, M. 2017. Hydrology Report for Lassen National Forest Over-Snow Vehicle Use Designation Final Environmental Impact Statement. Unpublished report. USDA Forest Service, Lassen National Forest, Susanville, California.

Mooney, H.A., M. Kueppers, G. Koch, J. Gorham, C. Chu, and W.E. Winner. 1988. Compensating effects to growth of carbon partitioning changes in response to SO2-induced photosynthetic reduction in radish. Oecologia, Vol. 75, No. 4, p. 502–506.

Musselman, R.C., and J.L. Korfmacher. 2007. Air quality at a snowmobile staging area and snow chemistry on and off trail in a Rocky Mountain subalpine forest, Snowy Range, Wyoming. Environmental monitoring and assessment 133(1-3), 321-334.

Neumann, P.W., and H.G. Merriam. 1972. Ecological effects of snowmobiles. Canadian Field Naturalist 86:207-212.

Ouren, D.S., C. Haas, C.P. Melcher, S.C. Stewart, P.D. Ponds, N.R. Sexton, L. Burris, T. Fancher, and Z.H. Bowen. 2007. Environmental effects of off-highway vehicles on Bureau of Land Management lands: A literature synthesis, annotated bibliographies, extensive bibliographies, and internet resources. Open-File Report 2007-1353. U.S. Geological Survey. Reston, Virginia.

Sanger, A. (Lassen National Forest Botanist). 2015. Personal communications with Bruce Davidson, Botanist, US Forest Service TEAMS Enterprise Unit, between March and October, 2015.

Stangl, J.T. 1999. Effects of Winter Recreation on Vegetation. Pages 119-121 in Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment. Report to the Greater Yellowstone Coordinating Committee. Olliff, T., K. Legg, and B. Kaeding, editors. Yellowstone National Park, Wyoming. 315 p.

Taylor, K., J. Mangold, and L.J. Rew. 2011. Weed Seed Dispersal by Vehicles. Montana State University Extension. MT201105AG. June, 2011.

U.S. Department of Agriculture (USDA Forest Service). 1992. Lassen National Forest Land and Resource Management Plan. Lassen National Forest. Susanville, California.

USDA Forest Service. 1999. Executive Order 13112. Presidential Documents, Invasive Species, President William Clinton. Federal Register Vol. 64, No. 25, February 8, 1999.

USDA Forest Service. 2004. Sierra Nevada Forest plan amendment: final supplemental environmental impact statement; record of decision. Vallejo, CA. Available online at: http://www.fs.fed.us/r5/snfpa/final-seis/index.html (accessed May 14, 2009).

USDA Forest Service. 2005. Forest Service Manual 2670-2671. Threatened, Endangered and Sensitive Plants and Animals. Chapter 2670. National Headquarters, Washington, DC. Effective: September 23, 2005.

USDA Forest Service. 2011. Forest Service Manual 2900 – Invasive Species Management. Chapter – Zero Code. National Headquarters, Washington DC. Effective: December 5, 2011.

USDA Forest Service. 2014. Use by Over-snow Vehicles (Travel Management Rule). Federal Register, June 18, 2014. 79(117): 34678-34681.

USDA Forest Service (USDA FS); USDI Bureau of Land Management (USDI BLM). 1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. Portland, Oregon. April, 1994.

USDA Forest Service (USDA FS); USDI Bureau of Land Management (USDI BLM). 2001. Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures, Standards and Guidelines. Portland, Oregon. January, 2001.

Von der Lippe, M. and I. Kowarik. 2007. Long-distance dispersal of plants by vehicles as a driver of plant invasions. Conservation Biology. 21(4): 986-996.

Wanek, W.J. 1971. Snowmobile impacts on vegetation, temperatures, and soil microbes. Pp. 116–129 in Chubb, M (Ed.), Proceedings of the 1971 snowmobile and off-road vehicle research symposium, Michigan State University Department of Parks and Recreation Resources Technical Report No.8, Michigan State University, East Lansing.

Winner, W.E., and C.J. Atkison. 1986. Absorption of Air Pollution by Plants, and Consequences for Growth. Trends in Ecology and Evolution. Vol. 1, p. 15–18.

Winter Wildlands Alliance (WWA). 2009. Seeing the Forest and the Trees – Assessing Snowmobile Damage in National Forests. A Report by Winter Wildlands Alliance. November, 2009. 3 p.

Cultural Resources

Belnap, Jayne. 1995. Surface Disturbances: Their Role in Accelerating Desertification. Environmental Monitoring and Assessment 37:39-57.

Belnap, Jayne. 2002. Impacts of Off-Road Vehicles on Nitrogen Cycles in Biological Soil Crusts: Resistance in Different U.S. Deserts. Journal of Arid Environments 52:155-165

Bevill, R., and E. Nilsson. 1999. The archaeology of the Tower House Site, CA-SHA-192/479/H, Shasta County, California : 2-Sha-299, P.M. 8.5/9.0, Report Submitted to California Dept. of Transportation, Environmental Branch, Headquarters, Sacramento, Calif.

Chatters, J.C, and J.E. Cleland. 1995. Chapter 27 - Conclusions: Environment, Population and Human Adaptation on the Middle Pit River. In Prehistory of the Middle Pit River, Northeastern California: Archaeological Investigations at Lake Britton, Pit 3, 4 & 5 Project, Volume I, edited by J. H. Cleland. Report submitted to Pacific Gas and Electric Company, San Francisco.

Cook, S.F. 1978. Historical Demography. In California, edited by Robert F. Heizer, pp. 91-98. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institute Washington, D.C.

Denali National Park and Preserve. 2003. Denali National Park and Preserve, Draft Backcountry Management Plan, General Management Plan Amendment, and Environmental Impact Statement.

Dregne, Harold E. 1982.Soil and Soil Formation in Arid Regions.In Environmental Effects of Off-Road Vehicles, Impacts and Management in Arid Regions, pp. 15-30, edited by Robert H. Webb and Howard G. Wilshire. Springer-Verlag, New York.

Dixon, R.B. and A.L. Kroeber.1919. Linguistic Families of California. University of California Publications in American Archaeology and Ethnology 16(3):47-118 Berkeley.

Elston, R.G. 1971. A Contribution to Washo Archaeology. Nevada Archaeological Survey Research Paper 2.

Elston, R.G., J.O. Davis, A. Leventhal, and C. Covington. 1977 The Archeology of the Tahoe Reach of the Truckee River. Report on file, Archaeological Survey. University of Nevada, Reno.

Garth, T.R. 1978. Atsugewi Handbook of North American Indians, Volume 8, California, pp. 236-243. Washington D.C.: Smithsonian Institution.

Greller, A., M. Goldstein, and L. Marcus. 1974. Snowmobile Impact on Three Alpine Tundra Plant Communities. Environmental Conservation. 1. 101 - 110.

Hildebrandt, W.R., and J.H. King. 2002 Projectile Point Variability along the Northern California-Great Basin Interface: Results from the Tuscarora-Alturas Projects. In Boundary Lands: Archaeological Investigations along the California-Great Basin Interface, edited by K. R. McGuire, pp. 5-28. Carson City, Nevada, Nevada Department of Cultural Affairs, Division of Museums and History.

Hildebrandt, W.R., and P. J. Mikkelsen. 1995. Projectile Point Typology. In Archaeological Investigations PGT-PG&E Pipeline Expansion Project Idaho, Washington, Oregon, and California, Vol. V, edited by R. U. Bryson, C. E. Skinner, and R. M. Pettigrew, pp. 1-1 to 1-40. Report submitted to Pacific Gas Transmission Company, Portland.

Jacobsen, W.H. 1966. Washo Linguistic Studies. In the Current Status of Anthropological Research in the Great Basin: 1964. Social Sciences and Humanities Publication, No. 1, pp. 113-136. Desert Research Institute Reno Nevada.

King, T. 2003. Places That Count: Traditional Cultural Properties in Cultural Resources Management. Altamira Press, Lanham, Maryland. 335 pp.

King, J., K. McGuire, K. Carpenter, M. Maniery, C. Baker, H. McCarthy, and H. Scotten. 2004. Class I Cultural Resources Overview and Research Design for the Alturas, Eagle Lake, and Surprise Resource Areas. Far Western Anthropological Research Group, Inc., Davis, California.

Kowta, M. 1988. The Archaeology and Prehistory of Plumas and Butte Counties, California: An Introduction and Interpretive Model. California Archaeological Site Inventory, Northeast Information Center, CSU Chico.

Layton, T.N. 1970. High Rock Archaeology: An Interpretation of the Prehistory of the Northwestern Great Basin. Unpublished Ph.D. dissertation, Department of Anthropology, Harvard University, Cambridge.

Lyneis, Margaret, David L. Weide, and Elizabeth von Till Warren. 1980. Impacts: Damage to Cultural Resources in the California Desert. United States Bureau of Land Management, Riverside, California.

Marshall, M.P. and H.J. Walt. 1984. Rio Abajo: Prehistory and history of a Rio Grande province. Santa Fe, New Mexico: Historic Preservation Division. Cited in U.S. Army Corps of Engineers. 1988. Site impacts in the Rio Abajo district central Rio Grande River Valley, New Mexico. In: Archeological Sites Protection and Preservation Notebook Technical Notes ASPPN I-7. Vicksburg: U.S. Army Engineer Waterways Experimental Station, Environmental Laboratory; 10.

Miller, W.R. 1966. Anthropological Linguistics in the Great Basin. In the Current Status of Anthropological Research in the Great Basin: 1964. Social Science and Humanities Publications No. 1, pp. 75-112. Desert Research Institute, Reno, Nevada.

Moratto, M.J. 1972. Paleo-demography in the Western Sierra Nevada, California. Paper presented at the annual meeting of the Society for American Archaeology.

National Park Service. 1995. How to Apply the National Register Criteria for Evaluation. National Park Service Bulletin 15, Washington D.C. 54 pp.

National Park Service. 1998. Director's Order (DO) 28: Cultural Resource Management Guidelines.

Olmsted, D.L. 1964. A History of Palaihnihan Phonology. University of California Publications in Linguistics 35. Berkeley.

Owen, K. 1984 Historic Overview. In Cultural Resources Study for the Pit 3, 4, and 5 Project, Shasta County, California. Report on file, Pacific Gas and Electric Company, San Francisco, California.

Parker, P.L. and T.F. King. 1992. Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Park Service Bulletin 38, Washington D.C. 22 pp.

Pippin, L.C. and E.M. Hattori. 1980. An Analysis of Prehistoric Artifacts from Lassen National Forest, California. Social Sciences Center, Desert Research Institute, University of Nevada System.

Riddell, F.A. 1978. Maidu and Konkow. Handbook of California Indian Volume 8 California pp. 370-386. Washington D.C. Smithsonian Institute.

Sampson, Michael P. 2007. The Effects of Off-Highway Vehicles on Archaeological Sites and Selected Natural Resources of Red Rock Canyon State Park, California State Parks, https://www.parks.ca.gov/?page_id=24576

Sapir, E. 1917. The Position of Yana in the Hokan Stock. University of California Publications in American Archaeology and Ethnology 13(1):1-34. Berkeley.

Schiffman, L. 2005. Archaeology, Off-Road Vehicles, and the BLM. Archaeology (online edition)

Shipley, W.F. 1978. Native Languages of California. Handbook of California Indians, Volume 8 California pp 80-90. Washington D.C.: Smithsonian Institute.

Sowl, K. and R. Poetter. 2004. Impact Analysis of Off-Road Vehicle Use for Subsistence Purposes on Refuge Lands and Resources Adjacent to the King Cove Access Project. Report on file, Izembeck National Wildlife Refuge, April 16. Electronic document available at: http://izembek.fws.gov/impanalysis.pdf.

Stewart, O.C. 1966. Tribal Distributions and Boundaries in the Great Basin. In the Current Status of Anthropological Research in the Great Basin: 1964. Social Sciences and Humanities Publication No. 1, pp. 167-237, Desert Research Institute, Reno, Nevada.

U.S. Army Corps of Engineers. 1988. Site impacts in the Rio Abajo district central Rio Grande River Valley, New Mexico. In: Archeological Sites Protection and Preservation Notebook Technical Notes ASPPN I-7. Vicksburg: U.S. Army Engineer Waterways Experimental Station, Environmental Laboratory; 10

Webb, Robert H., H. Craig Ragland, William H. Godwin and Dennis Jenkins. 1978. Environmental Effects of Soil Property Changes with Off-Road Vehicle Use. Environmental Management 2(3):219-233

Wheeler-Voegelin, E. 1974 Pit River Indians of California. American Indian Ethnohistory: California Indians 3:6-184. Garland, New York.

Listed and Sensitive Wildlife Species

Allen, A.W. 1987. The relationship between habitat and furbearers. Pages 164-179, In: Novak, M., J.A. Baker, and M.E. Obbard, eds. Wildland furbearer management and conservation in North America. Ontario Ministry of Natural Resources.

Altenbach, J. S. 1995. Entering mines to survey bats effectively and safely. Inactive mines as bat habitat: guidelines for research, survey, monitoring, and mine management in Nevada. Biological Resources Research Center, University of Nevada, Reno, Nevada, USA, pp 57-61.

Altenbach, J.S., and E.D. Pierson. 1995. The importance of mines to bats: an overview. pp. 7-18, in B.R. Riddle, ed. Inactive mines as bat habitat: guidelines for research, survey, monitoring and mine management in Nevada, Biological Resources Research Center, University of Nevada, Reno.

Andrew, J.M. and J.A. Mosher. 1982. Bald Eagle nest-site selection and nesting habitat in Maryland. Journal of Wildlife Management 46(2):382–390.

Anthony, R.G., R.L. Knight, G.T. Allen, B.R. McClelland, and J.I. Hodges. 1982. Habitat use by nesting and roosting bald eagles in the Pacific Northwest. U.S. Fish & Wildlife Publications, p.34.

Arthur, S.M. and W.B. Krohn. 1991. Activity patterns, movements, and reproductive ecology of fishers in southcentral Maine. Journal of Mammalogy 72(2), pp.379-385.

Aubry, K.B. 1997. The Sierra Nevada red fox (*Vulpes vulpes necator*). In: Harris, J.E.; and C.V. Ogan, eds. Mesocarnivores of northern California: biology, management and survey techniques. 1997 August 12-17; Humboldt State University, Arcata, CA. The Wildlife Society, California North Coast Chapter; 47-53.

Aubry, K.B. and D.B. Houston. 1992. Distribution and status of the fisher (*Martes pennanti*) in Washington. Northwestern Naturalist 73:69-79.

Baker, J.K. 1962. The manner and efficiency of raptor depredations on bats. Condor 64(6):500-504.

Baker, M.D., M.J. Lacki, and G.A. Falxa. 2008. Habitat use of pallid bats in coniferous forests of northern California. Northwest Science 82: 269-275.

Ballard, W.B., J.S. Whitman, and C.L. Gardner. 1987. Ecology of an exploited wolf population in south-central Alaska. Wildl. Mono. 98. 54 pp.

Banci, V. 1994. Wolverine. Pgs. 99-127 In: Ruggiero, L.F., Aubry, K.B., Buskirk, S.W. [et al.], tech. eds. 1994. American marten, fisher, lynx and wolverine in the western United States: the scientific basis for conserving forest carnivores. Gen. Tech. Rep. RM-254. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Research Station. 184 pp.

Barbour, R.W., and W.H. Davis. 1969. Bats of America. University of Kentucky Press, Lexington, KY. 286 pp.

Beck, A.J., and R.L. Rudd. 1960. Nursery colonies in the pallid bat. Journal of Mammalogy, 41:266-267.

Beck, T.W. and J. Winter. 2000. Survey protocol for the great gray owl in the Sierra Nevada of California. USDA Forest Service, Pacific Southwest Region, Vallejo, CA. 38 pp.

Bias, M.A. and R.J. Gutierrez. 1992. Habitat associations of California spotted owls in the central Sierra Nevada. The Journal of Wildlife Management 56(3):584-595.

Blakesley, J.A., M.E. Seamans, M.M. Conner, A.B. Franklin, G.C. White, R.J. Gutiérrez, J.E. Hines, J.D. Nichols, T.E. Munton, D.W.H. Shaw, J.J. Keane, G.N. Steger, and T.L. McDonald. 2010. Population dynamics of spotted owls in the Sierra Nevada, California. Wildlife Monographs. 174: 1–36.

Bombay, H.L. 1999. Scale perspectives in habitat selection and reproductive success for Willow Flycatchers (*Empidonax traillii*) in the central Sierra Nevada, California. Master's thesis, California State University, Sacramento. Pages 98-126.

Bond, M.L., R.J. Gutierrez, A.B. Franklin, W.S. LaHaye, C.A. May, and M.E. Seamans. 2002. Short-term effects of wildfires on spotted owl survival, site fidelity, mate fidelity, and reproductive success. Wildlife Society Bulletin. 30(4):1022-1028.

Bond, M.L., M.E. Seamans, and R.J. Gutierrez. 2004. Modeling nesting habitat selection of California spotted owls (*Strix occidentalis occidentalis*) in the central Sierra Nevada using standard forest inventory metrics. Forest Science 50(6):773-780.

Bond, M.L., D.E. Lee, R.B. Siegel, and J.P. Ward. 2009. Habitat use and selection by California spotted owls in a postfire landscape. Journal of Wildlife Management. 73(7):1116-1124.

Brown, P.E., R. Berry, and C. Brown. 1994. Foraging behavior of Townsend's big-eared bats (*Plecotus townsendii*) on Santa Cruz Island. Pages 367-369 in W.L. Halvorson and G.J. Maender, editors. Fourth California islands symposium: update on the status of resources. Santa Barbara Museum of Natural History, Santa Barbara, CA.

Brown, P.E., R.D. Berry, and C. Brown. 1995. The California leaf-nosed bat (Macrotus californicus) and American Girl Mining joint venture - impacts and solutions. pp. 54-56 In: Proceedings VI: Issues and techonology in the management of impacted wildlife. Thorne Ecological Institute, Boulder, CO.

Buehler, D.A., T.J. Mersmann, J.D. Fraser, and J.K. Seegar. 1991. Effects of human activity on bald eagle distribution on the northern Chesapeake Bay. The Journal of Wildlife Management 55(2):282-290.

Bull, E.L. and T.W. Heater. 2000. Resting and denning sites of American marten in northeastern Oregon. Northwest Science 74(3):179–185.

Bunnell, K.D., J.T. Flinders, and M.L. Wolfe. 2006. Potential impacts of coyotes and snowmobiles on lynx conservation in the intermountain west. Wildlife Society Bulletin, 34(3), pp. 828-838.

Burt, W.H. 1934. The mammals of southern Nevada. Trans. San Diego Soc. Nat. Hist.7:375-428.

Buskirk, S.W. and R.A. Powell. 1994. Habitat ecology of fishers and American martens. In: Ruggiero, L.F., Aubry, K.B., Buskirk, S.W. [et al.], tech. eds. 1994. American marten, fisher, lynx and wolverine in the western United States: the scientific basis for conserving forest carnivores. Gen. Tech. Rep. RM-254. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Research Station. 184 p.

Buskirk, S. and L. Ruggiero. 1994. American marten. In: L.F. Ruggiero, et al., technical editors. 1994. The scientific basis for conserving forest carnivores: American marten, fisher, lynx and wolverine in the Western United States. General Technical Report RM-254. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. Ft. Collins, CO. 184 pp.

Buskirk, S. W. and W. J. Zielinski. 2003. Small and mid-sized carnivores. Pages 207-249 In: C. Zabel and B. Anthony, editors. Mammal community dynamics: management and conservation in the coniferous forests of western North America, Cambridge University Press, Cambridge, UK.

Cahalane, V.H. 1939. Mammals of the Chiricahua Mountains, Cochise County, Arizona. Journal of Mammalogy, 20(4):418-440.

Cain, J.W. and M.L. Morrison. 2003. Reproductive ecology of dusky flycatchers in montane meadows of the central Sierra Nevada. Western North American Naturalist 63(4):507-512.

Call, M. W. 1978. Nesting habits and survey techniques for common western raptors. U. S. Dep. Inter., Bur. Land Manage, Portland, OR. Tech. Note No. 316. 115pp.

California Department of Fish and Game (CDFG). 1987. Sierra Nevada red fox: Five-year status report. Sacramento: California Department of Fish and Game. 6 pp. In USDI Fish and Wildlife Service. 2015b. http://www.dfg.ca.gov/biogeodata/cwhr/wildlife_habitats.asp#guide_pub Retrieved Mar 6, 2015.

California Department of Fish and Wildlife. 1999. Yellow-billed cuckoo. 2 pp.

California Department of Fish and Wildlife. California Interagency Wildlife Task Group. 2014. CWHR Version 9.0 personal computer program. Sacramento, California.

California Department of Fish and Wildlife (CDFW). 2015. CDFW News, CDFW reminds hunters of wolf pack in Siskiyou County. 2 pp.

California Department of Fish and Wildlife (CDFW). 2017. CWFW confirms presence of wolf pack in Lassen County, collars adult wolves. California Department of Fish and Wildlife News. Accessed

at: https://cdfgnews.wordpress.com/2017/07/05/cdfw-confirms-presence-of-wolf-pack-in-lassen-county-collars-adult-wolf/.

California Department of Fish and Wildlife (CDFW). 2018a. Wolf activity map. Accessed at: https://www.wildlife.ca.gov/conservation/mammals/gray-wolf.

California Department of Fish and Wildlife (CDFW). 2018b. Gray wolf quarterly update October 1, 2017 – December 31, 2017. Accessed at: https://www.wildlife.ca.gov/conservation/mammals/gray-wolf.

California Department of Parks and Recreation. Off Highway Motor Vehicle Recreation Division. 2010. Over Snow Vehicle Program. Final Environmental Impact Report Program Years 2010 – 2020. State Clearinghouse # 2009042113. December 2010.

Call, D.R., R.J. Gutierrez, and J. Verner. 1992. Foraging habitat and home-range characteristics of California spotted owls in the Sierra Nevada. Condor 94:880-888.

Cameron, S.A., J.D. Lozier, J.P. Strange, J.B. Koch, N. Cordes, L.F. Solter, and T.L. Griswold. 2011. Patterns of widespread decline in North American bumble bees. Proceedings of the National Academy of Sciences 108:662-667.

Canfield, J.E., L.J. Lyon, J.M. Hillis, and M.J. Thompson. 1999. Ungulates – effects of recreation on Rocky Mountain wildlife, a review for Montana (Chapter 6). Montana Chapter Wildlife Society. 25 pp.

Chandler, S.K., J.D. Fraser, D.A. Buehler, and J.K. Seegar. 1995. Perch trees and shoreline development as predictors of bald eagle distribution on Chesapeake Bay. The Journal of Wildlife Management 59(2):325-332.

Chatfield, A.H. 2005. Habitat selection by a California spotted owl population: a landscape scale analysis using resource selection functions. Dept. Fisheries, Wildlife, and Conservation Biology, University of Minnesota, St. Paul, Minnesota. 59 pp.

Chung-MacCoubrey, A. L. 1996. Bat species composition and roost use in pinyon-juniper woodlands of New Mexico. Pp. 118–123 in Bats and forests symposium (Barclay R. M. R., Brigham R. M., eds.). British Columbia Ministry of Forests, Victoria, Canada.

Clark B. S., Leslie D. M. Jr., Carter T. S. 1993. Foraging activity of adult female Ozark big-eared bats (Plecotus townsendii ingens) in summer. Journal of Mammalogy 74:422–427

Clark, D. R., and R. L. Hothem. 1991. Mammal mortality at Arizona, California and Nevada gold mines using cyanide extraction. Calif. Fish and Game, 77:61-69.

Clark, D. A. 2007. Demography and habitat selection of Northern Spotted Owls in post-fire landscapes of southwestern Oregon. Thesis. Oregon State University, Corvallis, Oregon.

Clark, D. A., R. G. Anthony, and L. S. Andrews. 2011. Survival rates of northern spotted owls in post-fire landscapes of southwest Oregon. Journal of Raptor Research 45:38–47.

Cleve, C., J. Perrine, B. Holzman, E. Hines. 2011. Addressing biased occurrence data in predicting potential Sierra Nevada red fox habitat in survey prioritization. Inter-Research 14:179-191.

Cockrum, E.L. and B.F. Musgrove. 1964. Additional records of the Mexican big-eared bat, *Plecotus phyllotis* (Allen), from Arizona. Journal of Mammalogy 45(3):472-474.

Cockrum, E.L. and E. Ordway. 1959. Bats of the Chiricahua Mountains, Cochise County, Arizona. American Museum novitates; no. 1938.

Commissaris, L.R. 1961. The Mexican big-eared bat in Arizona. J. Mammal. 42, 61–65.

Conner, M.M., J.J. Keane, C.V. Gallagher, G. Jehle, T.E. Munton, P.A. Shaklee, and R.A. Gerrard. 2013. Realized population change for long-term monitoring: California spotted owl case study. The Journal of Wildlife Management, 77(7):1449-1458.

Copeland, J.P., K.S. McKelvey, K.B. Aubry, A. Landa, J. Persson, R.M. Inman, J. Krebs, E. Lofroth, H. Golden, J.R. Squires, and A. Magoun. 2010. The bioclimatic envelope of the wolverine (*Gulo gulo*): do climatic constraints limit its geographic distribution? Canadian Journal of Zoology, 88(3):233-246.

Copeland, J.P., J.M. Peek, C.R. Groves, W.E. Melquist, K.S. McKelvey, G.W. McDaniel, C.D. Long, and C.E. Harris. 2007. Seasonal habitat associations of the wolverine in Central Idaho. Journal of Wildlife Management 71:2201-2212.

Cordero, A.M. and W.B. Miller. 1995. Reproductive anatomy of *Vespericola shasta* (Berry 1921) (Gastropoda: Pulmonata: Polygyridae), and descriptions of two new species of Vespericola from northern California. Veliger 38(4):304-311.

Cross S.P. and D. Clayton. 1995. Roosting habits of bats in southern Oregon. Second Annual Conference of the Wildlife Society, 12–17 September 1995, Portland, Oregon.

Crump, D.E. 2001. Western pond turtle (*Clemmys marmorata pallida*) nesting behavior and habitat use. Master's Thesis. Paper 2210. http://scholarworks.sjsu.edu/etd_thesis/2210.

Cryan, P. 1997. Distribution and roosting habits of bats in the southern Black Hills, South Dakota. Unpublished Master's Thesis, University of New Mexico, Albuquerque, NM. 96 pp.

Dalquest, W.W. 1947. Notes on the natural history of the bat *Corynorhinus rafinesquii* in California. Journal of Mammalogy 28(1):17-30.

Dalton V. M., Brack V. W., McTeer P. M. 1986. Food habits of the big-eared bat, Plecotus townsendii virginianus, in Virginia. Virginia Journal of Science 37:248–254.

Davis, C.J. 1998. Western pond turtle (*Clemmys marmorata pallida*) winter habitat use and behavior. Unpubl. Master's thesis, San Jose State University, San Jose, California. http://scholarworks.sjsu.edu/etd_thesis/1694 .

Delaney, D. K., and T. G. Grubb. 2003. Effects of off-highway vehicles on northern spotted owls: 2002 results. Report to California Department of Parks and Recreation, Off-Highway Vehicle Recreation Division, Contract No. 4391Z9-0-0055. United States Army Engineer Research and Development Center/Construction Engineering Research Laboratory, Champaign, Illinois, USA.

Delaney, D. K., T. G. Grubb, P. Beier, L. L. Pater, and M. H. Reiser. 1999. Effects of helicopter noise on Mexican spotted owls. Journal of Wildlife Management 63:60–76.

Detrich, P.J. and B. Woodbridge. 1994. Territory fidelity, mate fidelity, and movements of color-marked northern goshawks in the southern Cascades of California. Studies in Avian Biology 16:130-132.

Dobkin D. S., Gettinger R. G., Gerdes M. G. 1995. Springtime movements, roost use, and foraging activity of Townsend's big-eared bat (Plecotus townsendii) in central Oregon. Great Basin Naturalist 55:315–321.

Dorrance, M.J., P.J. Savage, and D.E. Huff. 1975. Effects of Snowmobiles on White-Tailed Deer. Journal of Wildlife Management 39:563-569.

Dunk, J.R, J.J. Keane, A.E. Bowles, T. Narahashi, D.L. Hansen, S. Vigallon, and J.J.V.G Hawley. 2011. Experimental effects of recreation on northern goshawks – final report submitted to the USDA Forest Service Region 5 Office. 71 pages.

Easterla, D.A. 1966. Yuma myotis and fringed myotis in southern Utah. Journal of Mammalogy, 47(2):350-351.

Easterla, D.A. and J. Baccus. 1973. A collection of bats from the Fronteriza Mountains, Coahuila, Mexico. The Southwestern Naturalist 17:424-427.

Esmoil, B. J., and S. H. Anderson. 1995. Wildlife mortality associated with oil pits in Wyoming. Prairie Naturalist, 27:81-88.

Evans, E., R. Thorp, S. Jepsen, and S.H. Black. 2008. Status Review of Three Formerly Common Species of Bumble Bee in the Subgenus Bombus: *Bombus affinis* (the rusty patched bumble bee), *B. terricola* (the yellowbanded bumble bee), and *B. occidentalis* (the western bumble bee). The Xerces society, Portland, OR.

Fellers, G.M., and E.D. Pierson. 2002. Habitat use and foraging behavior of Townsend's big-eared bat (*Corynorhinus townsendii*) in coastal California. Journal of Mammalogy 83:167-177.

Findley, J.S., and N.C. Negus. 1953. Notes on the mammals of the gothic region, Gunnison County, Colorado. Journal of Mammalogy, 34(2):235-239.

Flickinger, E. L., and C. M. Bunck. 1987. Number of oil-killed birds and fate of bird carcasses at crude oil pits in Texas. Southwestern Nat., 32:377-381.

Forsman, E.D. 1976. A preliminary investigation of the spotted owl in Oregon. M.S. Thesis. Oregon State Univ. Corvallis. 127pp.

Forsman, E.D., E.C. Meslow, and H.M. Wight. 1984. Distribution and biology of the spotted owl in Oregon. Wildlife Monographs. 87:1–64.

Franklin, J.F., and C.T. Dyrness. 1988. Natural vegetation of Oregon and Washington. Oregon State University Press, Corvallis, Oregon, USA.

Fraser, J.D., L.D. Frenzel, and J.E. Mathisen. 1985. The impact of human activities on breeding bald eagles in north-central Minnesota. The Journal of Wildlife Management 49(3):585-592.

Freddy, D.J., W.M. Bronaugh, and M.C. Fowler. 1986. Responses of mule deer to disturbance by persons on foot and snowmobiles. Wildlife Society Bulletin 14(1):63-68.

Frost, D. R., and R. M. Timm. 1992. Phylogeny of plecotine bats (Chiroptera: "Vespertilionidae"): proposal of a logically consistent taxonomy. Am. Mus. Novitates 3034:1-16.

Gaines, D. and S.A. Laymon. 1984. Decline, status and preservation of the Yellow-billed Cuckoo in California. Western Birds 15(2):49-80.

Gaines, W.L., P.H. Singleton, and R.C. Ross. 2003. Assessing the Cumulative Effects of Linear Recreation Routes on Wildlife Habitats on the Okanogan and Wenatchee National Forests. Gen. Tech. Rep. PNW-GTR-586. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 79 pp. http://www.fs.fed.us/pnw/pubs/gtr586.pdf.

Gancz, A.Y., I.K. Barker, R. Lindsay, A. Dibernardo, K. McKeever, and B. Hunter. 2004. West Nile virus outbreak in North American owls, Ontario, 2002. Emerging Infectious Diseases. 10: 2135–2142.

Genter, D.L. 1986. Wintering bats of the Upper Snake River plain: occurrence in lava-tube caves. Great Basin Naturalist 46(2):241-244.

Germano, D.J. 2010. Ecology of western pond turtles (*Actinemys marmorata*) at sewage-treatment facilities in the San Joaquin Valley, California. The Southwestern Naturalist 55(1):89-97.

Germano, D.J. and G.B. Rathbun. 2008. Growth, population structure, and reproduction of western pond turtles (*Actinemys marmorata*) on the central coast of California. Chelonian Conservation and Biology 7(2):188-194.

Gilbert, J.H., J.L. Wright, D.J. Lauten, and J.R. Probst. 1997. Den and rest-site characteristics of American marten and fisher in northern Wisconsin. Pp. 135-145 in G. Proulx, H.N. Bryant, and P.M. Woodard, eds. Martes: Taxonomy, ecology, techniques, and management. Provincial Museum of Alberta, Edmonton, Alberta, Canada.

Glenn, E. M., R. G. Anthony, and E. D. Forsman. 2010. Population trends in northern spotted owls: associations with climate in the Pacific Northwest. Biological Conservation 143:2543–2552

Glenn, E.M., R.G. Anthony, E.D. Forsman, and G.S. Olson. 2011. Reproduction of northern spotted owls: the role of local weather and climate. J. Wildlife Management 75(6):1279-1294.

Goldade, C. M., J. A. Dechant, D. H. Johnson, A. L. Zimmerman, B. E. Jamison, J. O. Church, and B. R. Euliss. 2002. Effects of management practices on wetland birds: Yellow Rail. Northern Prairie Wildlife Research Center, Jamestown, ND. 21 pp.

Graham, R.E. 1966. Observations on the roosting habits of the big-eared bat, *Plecotus townsendii*. California limestone caves. Cave Notes, 8(3):17-22.

Graham, Russell T.; Rodriguez, Ronald L.; Paulin, Kathleen M.; Player, Rodney L.; Heap, Arlene P.; Williams, Richard. 1999. The northern goshawk in Utah: habitat assessment and management recommendations. Gen. Tech. Rep. RMRS-GTR-22. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 48 p.

Green, G.A., H.L. Bombay, and M.L. Morrison. 2003. Conservation assessment of the willow flycatcher in the Sierra Nevada. Foster Wheeler Environmental Corporation and the University of California. 67 pp.

Grinnell, J. and A.H. Miller. 1944. The distribution of the birds of California. Pacific Coast Avifauna. 27: 203-205 in USDI Fish and Wildlife Service 2015b.

Grinnell, J., J.S. Dixon, and J.M. Linsdale. 1937. Furbearing mammals of California. Univ. of Calif. Press, Berkeley. 777 pp.

Grubb, T.G. and R.M. King. 1991. Assessing human disturbance of breeding bald eagles with classification tree models. The Journal of Wildlife Management 55(3):500-511.

Grubb, T.G., A.E. Gatto, L.L. Pater, and D.K. Delaney. 2012. Response of nesting northern goshawks to logging truck noise, Kaibab National Forest, Final Report. USDA Forest Service, Southwest Region. 31 pp.

Gutierrez R.J. and G.F. Barrowclough. 2005. Redefining the distributional boundaries of the northern and California spotted owls: implications for conservation. Condor 107:182-187.

Gutierrez, R.J., A.B. Franklin, and P.C. Carlson. 1995a. Population ecology of the northern spotted owl (*Strix occidentalis caurina*) in northwestern California: annual results, 1994. Annual Progress Report (Contract #53-91S8-4-FW20) to Region 5, USDA Forest Service. Contractor: Humbolt State University, Arcata, CA.

Gutierrez R.J., A.B. Franklin, and W.S. LaHaye. 1995b. Spotted owl (*Strix occidentalis*). The birds of North America, number 179. The American Ornithologists' Union, Washington D.C. USA, and the Academy of Natural Sciences, Philadelphia, Pennsylvania. Availalble online: http://bna.birds.cornell.edu/bna/species/179/articles/introduction

Gutierrez, R.J., M.Z. Peery, D.J. Tempel, and W.J. Berigan. 2012. Population ecology of the California spotted owl in the central Sierra Nevada: annual results 2011. USDA Forest Service, Region 5. 39 pp.

Hall, E.R. 1946. Mammals of Nevada. Univ. California Press, Berkeley, 710 pp.

Hall, E.R. 1981. The mammals of North America. John Wiley & Sons, New York, 2nd ed.

Halofsky, J.E., D.L. Peterson, K.A. O'Halloran, and C.H. Hoffman, eds. 2011. Adapting to climate change at Olympic National Forest and Olympic National Park. Gen. Tech. Rep. PNW-GTR-844. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 130 p.

Handley, C.O., 1959. A revision of the American bats of the genera Euderma and Plecotus. Proc. U.S. Nat. Mus. 110: 95–246.

Hargis, C.D., C. McCarthy, and R.D. Perloff. 1994. Home ranges and habitats of Northern Goshawks in eastern California. Stud. Avian Biol. 16:66–74.

Hatfield, R. 2012. Records of western and Franklin's bumble bees in the western United States. Database records provided by the Xerces Society, Portland, OR on 2/29/12.

Hayward, L.S., A.E. Bowles, J.C. Ha, and S.K. Wasser. 2011. Impacts of acute and long-term vehicle exposure on physiology and reproductive success of the northern spotted owl. Ecosphere. 2(6): article 65.

Heinrich, B. 1979. Resource heterogeneity and patterns of movement in foraging bumble-bees. Oecologia 40, 235–245.

Hermanson, J.W., and T.J. O'Shea. 1983. *Antrozous pallidus*. American Society of Mammalogists, Mammalian Species 213:1-8.

Hirshfeld, J.R. and M.J. O'Farrell. 1976. Comparisons of differential warming rates and tissue temperatures in some species of desert bats. Comparative Biochemistry and Physiology Part A: Physiology, 55(1):83-87.

Hoffmeister, D.F. and W.W. Goodpaster. 1954. Mammals of the Huachuca Mountains, southeastern Arizona. Illinois Biol. Monogr. 24:1-52.

Hopwood, J., M. Vaughan, M. Shepherd, D. Biddinger, E. Mader, S. Hoffman Black and C. Mazzacano. 2012. Are Neonicotinoids Killing Bees? A Review of Research into the Effects of Neonicotinoid Insecticides on Bees, with Recommendations for Action. Xerces Society, Portland, OR. Available at http://www.xerces.org/wp-content/uploads/2012/03/Are-Neonicotinoids-Killing-Bees_Xerces-Society1.pdf

Hornocker, M.G. and H.S. Hash. 1981. Ecology of the wolverine in northwestern Montana. Canadian Journal of Zoology, 59(7):1286-1301.

Howell, A.B. 1920. Some Californian experiences with bat roosts. Journal of Mammalogy 1(4):169-177.

Humphrey, S.R., and T.H. Kunz. 1976. Ecology of a Pleistocene relict, the western big-eared bat (*Plecotus townsendii*), in the southern great plains. Journal of Mammalogy 57(3):470-494.

Irwin, L. L., L. A. Clark, D. C. Rock, and S. L. Rock. 2007. Modeling foraging habitat of California spotted owls. Journal of Wildlife Management 71:1183–1191.

Jenness, J.S., P. Beier, and J.L. Gainey. 2004. Associations between forest fire and Mexican spotted owls. Forest Science 50(6): 765-772.

Johnston, D. S., and M. B. Fenton. 2001. Individual and population-level variability in diets of pallid bats (Antrozous pallidus). Journal of Mammalogy 82:362–373.

Johnston, D.S. and J.R. Gworek. 2006. Pallid bat (*Antrozous pallidus*) habitat use in a coniferous forest in northeastern California. Bat Research News 47:114.

Johnston, D.S., B. Hepburn, J. Krauel, T. Stewart, and D. Rambaldini. 2006. Winter ecology of pallid bats in central coastal California. Bat Research News 47:115.

Johnston, D.J., G. Tatarian, and E.D. Pierson. 2004. California bat mitigation: techniques, solutions, and effectiveness. Contract Report #2394-01 for California Department of Transportation, Sacramento, CA, 125 pp.

Jones, C. 1965. Ecological distribution and activity periods of bats of the Mogollon Mountains area of New Mexico and adjacent Arizona. Tulane Studies in Zoology 12(4):93-100.

Jones, C., and R.D. Suttkus. 1972. Notes on netting bats for eleven years in western New Mexico. Southwestern Naturalist 16(3/4):261-266.

Kalinowski, R.S., M.D. Johnson, and A. Rich. 2014. Habitat relationships of great gray owl prey in meadows of the Sierra Nevada mountains. Wildlife Society Bulletin 38(3):547-556.

Kapnick, S. and A. Hall. 2010. Observed climate–snowpack relationships in California and their implications for the future. J Climate 23:3446–3456.

Keane, J.J. 1999. Ecology of the northern goshawk in the Sierra Nevada, California. Doctoral dissertation from the University of California, Davis, CA. 124 pp.

Keane, J. 2013. California spotted owl: Scientific consideration for forest planning. Chapter 7.2 in Science Synthesis to Support Land and Resource Management Plan Revision in the Sierra Nevada and Southern Cascades. Pacific Southwest Research Station.

Keane, J.J. 2014. California spotted owl: scientific considerations for forest planning. In: Long, J.W.; Quinn-Davidson, L.; Skinner, C.N., eds. Science synthesis to support socioecological resilience in the Sierra Nevada and southern Cascade Range. Gen. Tech. Rep. PSW-GTR-247.

Kelly, G.M. 1977. Fisher (*Martes pennanti*) biology in the White Mountain National Forest and adjacent areas. Dissertation, University of Massachusetts, Amherst, USA.

Kirk, T.A. and W.J. Zielinski. 2009. Developing and testing a landscape habitat suitability model for the American marten (*Martes americana*) in the Cascades mountains of California. Landscape Ecology 24:759–773.

Kirk, T.A. and W.J. Zielinski. 2010. Functional habitat connectivity of the American marten (Martes Americana) in Northeastern California using least-cost corridor modeling. 43 pp.

Klos, P.Z., T.E. Link, and J.T. Abatzoglou. 2014. Extent of the rain-snow transition zone in the western U.S. under historic and projected climate. Geophysical Research Letters 41.

Knight, R.L., and S.K. Knight. 1984. Responses of wintering bald eagles to boating activity. Journal of Wildlife Management 48:999-1004.

Knight, R.L. and S.K. Skagen. 1988. Agonistic Asymmetries and the Foraging Ecology of Bald Eagles. Ecology 69(4):1188-1194.

Koch, J., J. Strange, and P. Williams. 2012. Bumble Bees of the Western United States. U.S. Forest Service and the Pollinator Partnership, Washington, D.C. 144 pp.

Kolbe, J.A., J.R. Squires, D.H. Pletcher, L.F. Ruggiero. 2007. The Effect of Snowmobile Trails on Coyote Movements Within Lynx Home Ranges. Journal of Wildlife Management 71(5):1409-1419.

Koronkiewicz, T. J., M. K. Sogge, C. Van Riper III, and E. H. Paxton .2006. Territoriality, site fidelity, and survivorship of Willow Flycatchers wintering in Costa Rica. Condor 108: 558–570.

Kunz, T.H., and R.A. Martin. 1982. *Plecotus townsendii*. American Society of Mammalogists, Mammalian Species 175:1-6.

Lacki, M. J., et al. 1994. Observations on Seasonal Cycle, Population Patterns and Roost Selection in Summer Colonies of Plecotus townsendii virginianus in Kentucky. The American Midland Naturalist 131(1): 34-42

Lande, R. and G.F. Barrowclough. 1987. Effective population size, genetic variation, and their use in population management. In: Soule M editor: Viable populations for conservation. New York: Cambridge Univ Press. Pages 86–123 in USDI Fish and Wildlife Service 2015b.

Lawler, J.J., H.D. Safford, and E.H. Girvetz. 2012. Martens and fishers in a changing climate in K.B. Aubry (ed). Biology and Conservation of Martens, Sables, and Fishers: A New Synthesis. Cornell University Press, Ithaca, NY.

Lee, D.E., M.L. Bond, and R.B. Siegel. 2012. Dynamics of breeding-season site occupancy of the California spotted owl in burned forests. Condor 114:792–802.

Levi, T. and C.C. Wilmers. 2012. Wolves-coyotes-foxes: a cascade among carnivores. Ecology 93(4):921-929.

Lewis, S.E. 1994. Night roosting ecology of pallid bats (*Antrozous pallidus*) in Oregon. American Midland Naturalist 132(2):219-226.

Lewis, S.E. 1996. Low roost-site fidelity in pallid bats: associated factors and effect on group stability. Behavioral Ecology and Sociobiology 39(5):335-344.

Lofroth, E.C., C.M. Raley, J.M. Higley, R.L. Truex, J.S. Yaeger, J.C. Lewis, P.J. Happe, L.L. Finley, R.H. Naney, L.J. Hale, A.L. Krause, S.A. Livingston, A.M. Myers, and R.N. Brown. 2010. Conservation of Fishers (*Martes pennanti*) in South-Central British Columbia, Western Washington, Western Oregon, and California–Volumes I-III.

Lovich, J. and K. Meyer. 2002. The western pond turtle (*Clemmys marmorata*) in the Mojave River, California, USA: highly adapted survivor or tenuous relict? Journal of Zoology London 256: 537-545.

Lubcke, G. and D. Wilson, D. 2007. Variation in shell morphology of the western pond turtle (Actynemys marmorata Baird and Girard) from three aquatic habitats in Northern California. J. Herpetol. 41, 107–114.

MacKenzie, D.I., Seamans, M.E., Guitierrez, R.J. and J.D. Nichols. 2012. Investigating the population dynamics of California spotted owls without marked individuals. Journal of Ornithology, 152:597–604.

Magoun, A.J. and J.P. Copeland. 1998. Characteristics of wolverine reproductive den sites. The Journal of Wildlife Management, pages1313-1320.

Manley, P.N., J.P. Stumpf, W.B. Davis, D. Craig, K. Mick. 2004. Pilot test of programmatic approach to monitoring winter conditions and trends of wildlife populations and habitats in off-highway vehicle use areas; first winter pilot test, winter 2002-2003, final report. March 20 2004. 38 pp.

Manlick, P.J., J.E. Woodford, B. Zuckerberg, and J.N. Pauli. 2017. Niche compression intensifies competition between reintroduced American martens (Martes Americana) and fishers (Pekania pennanti). Journal of Mammalogy 98(3):690-702.

Manning, R. and J. Jones. 1988. A new subspecies of fringed myotis, Myotis thysanodes, from the northwestern coast of the United States. Occasional Papers, The Museum, Texas Tech University 123:1-6.

Marcot B. G. 1984. Winter use of some northwestern California caves by western big-eared bats and long-eared Myotis. Murrelet 65:46.

Mathewson, H.A., H.L. Loffland, and M.L. Morrison. 2011. Demographic Analysis for Willow Flycatcher Monitoring in the Central Sierra Nevada, 1997–2010: Final Report. Texas A & M University.

Mazurek, M.J. 2004. A maternity roost of Townsend's big-eared bats (*Corynorhinus townsendii*) in coast redwood basal hollows in northwest California. Northwestern Naturalist 85: 60-62.

McNab, W.H., and P.E. Avers. 1994. Ecological subregions of the United States: section descriptions. USDA Forest Service, Washington, D.C., USA. Available online at: https://www.fs.fed.us/land/pubs/ecoregions/.

McNamara, M. 2016. Over-snow Vehicle Use Designation Environmental Impact Statement Hydrology Report.

Meidinger, D., and J. Pojar. 1991. Ecosystems of British Columbia. British Columbia Ministry of Forests, Victoria, British Columbia, Canada.

Miller, G.S. 1989. Dispersal of juvenile northern spotted owls in western Oregon. M.S. Thesis, Oregon State Univ. Corvallis. 139 pp.

Miller, J.D. and A.E. Thode. 2007. Quantifying burn severity in a heterogeneous landscape with a relative version of the delta Normalized Burned Ratio (dNBR). Remote Sensing of Environment 109:66-80.

Mohr, C. E. 1972. The status of threatened species of cave-dwelling bats. Bulletin of the National Speleological Society, 34(2), 33-45.

Moriarty, K. 2011. Decline in American marten occupancy rates at Sagehen Experimental Forest, California. The Journal of Wildlife Management 75(*):1774-1787.

Moriarty, K. 2014. Habitat use and movement behavior of Pacific Marten (Martes caurina) in response to forest management practices in Lassen National Forest, California. Ph.D. dissertation, Oregon State University. 145 pp.

Moriarty, K., W.J. Zielinski, A.G. Gonzales, T.E. Dawson, K.M. Boatner, C.A. Wilson, F.V. Schlexer, K.L. Pilgrim, J.P. Copeland, and M.K. Schwartz. 2009. Wolverine confirmation in California after nearly a century: native or long-distance immigrant? Northwest Science 83(2):154-162.

Moriarty, K.M., C.W. Epps. M.G. Betts, D.J. Hance, J.D. Bailey, W.J. Zielinski. 2015. Experimental evidence that simplified forest structure interacts with snow cover to influence functional connectivity for Pacific martens. Landscape Ecology 30(10:1865-1877.

Morrison, M.L., R.J. Young, J.S. Rosmos, and R. Golightly. 2011. Restoring forest raptors: Influence of human disturbance and forest condition on northern goshawks. Restoration Ecology 19(2):273-279.

Murphy, D.D., and C.M. Knopp. 2000. Lake Tahoe watershed assessment. General Technical Report-Pacific Southwest Research Station, USDA Forest Service.

Musser, G.G. and S.D. Durrani. 1960. Notes on *Myotis thysanodes* in Utah. Journal of Mammalogy 41(3):393-394.

NatureServe. 2017. Martes caurina. NatureServe Explorer. 7 pp. Accessed online at: http://explorer.natureserve.org/index.htm.

Navo, K. 1995. Guidelines for external surveys of mines for bat roosts. Pp. 49-54, In: Inactive mines as bat habitat: guidelines for research, survey, monitoring and mine management in Nevada. (B. R. Riddle, ed.). Biol. Resources Res. Ctr., Univ.of Nevada, Reno, NV.

O'Farrell. M.J., and W.G. Bradley. 1970. Activity patterns of bats over a desert spring. Journal of Mammalogy 51(1):18-26.

O'Farrell, M.J., W.G. Bradley, and G.W. Jones. 1967. Fall and winter bat activity at a desert spring in southern Nevada. Southwestern Naturalist 12:163-171.

O'Farrell, M.J. and E.H. Studier. 1980. *Myotis thysanodes*. Mammalian Species 137:1-5.

Olliff, T., K. Legg, and B. Kaeding, editors. 1999. Effects of winter recreation on wildlife of the Greater Yellowstone Area: a literature review and assessment. Report to the Greater Yellowstone Coordinating Committee. Yellowstone National Park, Wyoming. 315 pages.

Oregon Department of Fish and Wildlife (ODFW). 2015. Biological status review for the Gray Wolf (*Canis lupus*) in Oregon and evaluation of criteria to remove the Gray Wolf from the List of Endangered Species under the Oregon Endangered Species Act. Retrieved March 31, 2015, from http://www.dfw.state.or.us/agency/commission/minutes/15/04_April/Exhibit%20F_Attachment%202_%20Wolf%20Status%20Review.pdf. 76 pp.

O'Shea, T.J. and T.A. Vaughn. 1977. Nocturnal and seasonal activities of the pallid bat, Antrozous pallidus. Journal of Mammalogy 58(3): 269-284.

Paradiso, J. L., and A. M. Greenhall. 1967. Longevity records for American bats. American Midland Naturalist 78: 251-252.

Pearson, O.P., M.R. Koford, and A.K. Pearson. 1952. Reproduction of the lump-nosed bat (*Corynorhinus rafinesquei*) in California. Journal of Mammalogy 33(3):273-320.

Peery M.Z., Gutiérrez R.J., Kirby R., LeDee O.E., and W. LaHaye. 2012. Climate change and spotted owls: potentially contrasting responses in the Southwestern United States. Global Change Biology 18: 865–880.

Perkins, J.M., and C. Levesque. 1987. Distribution, status, and habitat affinities of Townsend's big-eared bat (*Plecotus townsendii*) in Oregon. Unpublished report 86-5-01. Oregon Department of Fish and Wildlife, Portland, Oregon, USA.

Perkins, J.M., J.R. Peterson, and A.J. Perkins. 1994. Roost selection in hibernating *Plecotus townsendii*. Bat Research News 35:110.

Perkins, J. M. and T. Schommer. 1991. Survey protocol and interim species strategy for Plecotus townsendii in the Blue Mountains of Oregon and Washington. Unpublished report, Wallawa-Whitman National Forest, Baker, Oregon.

Perrine, J. 2005. Ecology of red fox (*Vulpes vulpes*) in the Lassen Peak region of California, USA. Ph.D. dissertation, University of California, Berkeley, California, USA.

Perrine, J., L. Campbell, and G. Green. 2010. Sierra Nevada red fox (*Vulpes vulpes necator*): A conservation assessment. U.S. Forest Service, Region 5. Vallejo, CA. Report R5-FR-010.

Peterson, A. 1986. Habitat suitability index models: bald eagle (breeding season) (No. 82/10.126). US Fish and Wildlife Service.

Piaggio, A.J., K.E.G. Miller, M.D. Matocq, and S.L. Perkins. 2009. Eight polymorphic microsatellite loci developed and characterized from Townsend's big-eared bat, Corynorhinus townsendii. Molecular Ecology Resources 9(1): 258-260.

Piaggio, A.J., K.W. Navo, and C.W. Stihler. 2009. Intraspecific comparison of population structure, genetic diversity, and dispersal among three subspecies of Townsend's big-eared bats, Corynorhinus townsendii, C. t. pallescens, and the endangered C. t. virginianus. Conservation genetics 10(1): 143-159.

Piaggio, A.J. and S.L. Perkins. 2005. Molecular phylogeny of North American long-eared bats (Vespertilionidae: Corynorhinus); inter- and intraspeciWc relationships inferred from mitochondrial and nuclear DNA sequences. Molecular Phylogenetics and Evolution 37:762-775.

Pierson, E. D. 1989. Help for Townsend's big-eared bats in California. Bats, 7:5-8.

Pierson, E.D., W.E. Rainey, D.M. Koontz. 1991. Bats and mines: experimental mitigation for Townsend’s big-eared bat at the McLaughlin Mine in California. 12 pp.

Pierson, E.D. and G.M. Fellers. 1998. Distribution and ecology of the big-eared bat, *Corynorhinus townsendii* in California. Biological Resources Division, U.S. Geological Survey, Species at Risk Report, 92 pp.

Pierson, E.D., and P.A. Heady. 1996. Bat surveys of Giant Forest Village and vicinity, Sequoia National Park. Report for National Park Service, Denver Service Center, Denver, CO. 27 pp.

Pierson, E.D. and W.E. Rainey. 1994. Distribution, status, and management of Townsend’s big-eared bat (*Corynorhinus townsendii*) in California. BMCP Technical Report Number 96-7. California Department of Fish and Game. 36 pp.

Pierson, E.D. and W.E. Rainey. 1998. The distribution, status and management of Townsend’s big-eared bat (*Corynorhinus townsendii*) in California. Calif. Dept. of Fish and Game, Bird and Mammal Conservation Program Rep. 96-7. 36 pp.

Pierson, E.D., W.E. Rainey, and C. Corben. 2001. Seasonal patterns of bat distribution along an altitudinal gradient in the Sierra Nevada. Report to California State University at Sacramento Foundation, Yosemite Association, and Yosemite Fund, 70 pp.

Pierson, E.D., P.W. Collins, W.E. Rainey, P.A. Heady, and C.J. Corben. 2002. Distribution, status and habitat associations of bat species on Vandenberg Air Force Base, Santa Barbara County, California, Santa Barbara Museum of Natural History Technical Reports No. 1:49-65.

Pierson, E.D., W.E. Rainey, P.A. Heady and W.F. Frick. 2004. Bat surveys for State Route 104 Bridge over Dry Creek, Amador County: replacement project. Contract Report for California Department of Transportation, Stockton, CA. 53 pp.

Postovit, H.R., and B.C. Postovit. 1987. Impacts and mitigation techniques. Pages 183-208 in Natl. Wildl. Fed. Raptor Manage. Tech. Manual, Sci. Tech. Ser. No. 10 Potvin, F., L. Belanger, and K. Lowell. 2000. Marten habitat selection in a clearcut boreal landscape. Conservation Biology 14:844–857.

Powell, R.A. 1993. The fisher: life history, ecology and behavior. Second edition. University of Minnesota Press, Minneapolis, Minnesota, USA.

Powell, R.A., and W.J. Zielinski. 1994. The fisher. Pages 38-73 in L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, L.J. Lyon, and W.J. Zielinski, eds. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States (General Technical Report RM-254). USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.

Powell, R.A., R.C. Swiers, A.N. Facka, S. Matthews, and D. Clifford. 2014. Understanding a fisher reintroduction in northern California from 2 perspectives. Annual Report for 2013. USFWS, Yreka; CDFW, Redding; Sierra Pacific Industries, Anderson, California. 35 pp.

Purcell, K.L., C.M. Thompson, and W.J. Zielinski. 2012. Fishers and American martens. Pp. 47-60 In Managing Sierra Nevada forests (M. North, editor). USDA Forest Service, Pacific Southwest Research Station Albany, CA. General Technical Report PSW-GTR-237.

Rabe, M.J., T.E. Morrell, H. Green, J.C. deVos, Jr., and C.R. Miller. 1998. Characteristics of ponderosa pine snag roosts used by reproductive bats in northern Arizona. Journal of Wildlife Management 62(2):612-621.

Rainey, W. E. 1995. Tools for low-disturbance monitoring of bat activity. pp. 62-71, In: Inactive mines as bat habitat: guidelines for research, survey, monitoring and mine management in Nevada. (B. R. Riddle, ed.). Biological Research Center, Univ. Nevada, Reno.

Rainey, W.E. and E.D. Pierson. 1996. Cantara spill effects on bat populations of the upper Sacramento River, 1991-1995. Report to California Department of Fish and Game, Redding, CA, (Contract # FG2099R1). 98 pp.

Rainey, W.E., E.D. Pierson, M. Colberg, and J.H. Barclay. 1992. Bats in hollow redwoods: seasonal use and role in nutrient transfer into old growth communities. Bat Research News 33(4):71.

Rao S., W.P. Stephen, C. Kimoto, and S.L. DeBano. 2011. The status of the ‘red-listed’ Bombus occidentalis (Hymenoptera: Apiformes) in northeastern Oregon. Northwest Science 85: 64–67.

Raphael, M.G., and L.L.J. Jones. 1997. Characteristics of resting and denning sites of American martens in central Oregon and western Washington. Pages 146-165 In G. Proulx, H. N. Bryant, and P M. Woodard (editors) Martes: Taxonomy, Ecology, Techniques, and Management. Provincial Museum of Alberta, Edmonton, Alberta, Canada.

Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce, Jr., G. Goodwin, R. Smith, and E.L. Fisher. 1992. Management recommendations for the Northern Goshawk in the Southwestern United States. USDA Forest Service General Technical Report RM-217.

Reynolds, R. T., R. T. Graham, and D. A. Boyce, Jr 2006. An ecosystem-based conservation strategy for the northern goshawk. Studies in Avian Biology 31: 299-311.

Roberts, S. and M. North. 2012. California Spotted Owls. Chapter 5 in PSW-GTR-237 Managing Sierra Nevada Forests, USDA Forest Service, Pacific Southwest Research Station.

Roberts, S.L., J.W. van Wagtendonk, A.K. Miles, and D.A. Kelt. 2011. Effects of fire on spotted owl site occupancy in a late-successional forest. Biological Conservation 144:610-619.

Roest, A.I. 1951. Mammals of the Oregon Caves area, Josephine County. Journal of Mammalogy 32:345-351.

Rosenberg, D.K., and Anthony, R.G. 1992. Characteristics of northern flying squirrel populations in young second- and old-growth forests in western Oregon. Can. J. Zool. 70: 161–166.

Rosenberg, D.K., C.J. Zabel, and B.R. Noon. 1994. Northern spotted owls: influence of prey base – a comment. Ecology 75(5):1512-1515.

Ruggiero, L.F., D.E. Pearson, S.E. Henry. 1998. Characteristics of American marten den sites in Wyoming. Journal of Wildlife Management 62(2):663–673.

Rustigian-Romsos, H.L. and W.D. Spencer. 2010. Predicting habitat suitability for the American marten on the Lassen National Forest, final report. Produced by Conservation Biology Institute. 33pp.

Sacks B., H. Wittmer, and M. Statham. 2010. The Native Sacramento Valley red fox. Report to the California Department of Fish and Game, May 30, 2010, 49pp.

Sacks, B.N., C.B. Quinn, and P.B. Alden. 2015. Sierra Nevada red fox monitoring: phase 1.Report to the U.S. Forest Service, Pacific Southwest Region. Agreement No. 12-CS-11052007-021. 37 pp In USDI Fish and Wildlife Service 2015b.

Sakai, H.F., and Noon, B.R. 1993. Dusky-footed woodrat abundance in different-aged stands in northwestern California. J. Wildl. Manage. 57: 373-381.

Sample B. E., Whitmore R. C. 1993. Food habits of the endangered Virginia big-eared bat in West Virginia. Journal of Mammalogy 74:428–435

Sanders, S. and M.A. Flett. 1989. Ecology of a Sierra Nevada population of willow flycatcher (*Empidonax traillii*), 1986-1987. State of California, The Resources Agency, Department of Fish and Game, Wildlife Management Division. 27 pp.

Schempf, P.F. and M. White. 1977. Status of six furbearer populations in the mountains of northern California. U.S. Department of Agriculture, Forest Service. California Region. December.

Schroeder, M.A., C.L. Aldridge, A.D. Apa, J.R. Bohne, C.E. Braun, S.D. Bunnell, J.W. Connelly, P.A. Deibert, S.C. Gardner, M.A. Hilliard, G.D. Kobriger, S.M. McAdam, C.W. McCarthy, J.J. McCarthy, D.L. Mitchell, E.V. Rickerson, and S.J. Stiver. 2004. Distribution of sage-grouse in North America. The Condor 106:363-376.

Scott, N.J., G.B. Rathbun, T.G. Murphy, and M.B. Harker. 2008. Reproduction of pacific pond turtles (*Actinemys marmorata*) in coastal streams of central California. Herpetological Conservation and Biology 3(2):143-148.

Seamans, M.E., J.C. Corcoran, and A.G. Rex. 2004. Southernmost record of a Spotted Owl X Barred Owl hybrid in the Sierra Nevada.Western Birds 35:173–174.

Seamans, M. E. and R.J. Gutiérrez. 2007. Habitat selection in a changing environment; the relationship between habitat alteration and spotted owl territory occupancy and breeding dispersal. Condor 109: 566–576.

Sherwin, R. E., D. Stricklan, and D. S. Rogers. 2000. Roosting affinities of Townsend's big-eared bat (Corynorhinus townsendii) in northern Utah. Journal of Mammalogy 81:939-947.

Shoemaker, L.G., and M.J. Lacki. 1993 . [ABS]. Selection of lepidopteran prey by Plecotus townsendii virginianus in the Daniel Boone National Forest of Kentucky. Bat Research News, 34(4):128.

Shuford, W.D., and T. Gardali, editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Siegel, R.B. R.L. Wilkerson, and D. DeSante. 2008. Extirpation of the willow flycatcher from Yosemite National Park. Western Birds 39:8-21.

Simmons, N.B. 2005. Chiroptera. Pages 312-529, in Mammal Species of the World: a taxonomic and geographic reference. D.E. Wilson and D.M. Reeder, Editors. Volume I. Johns Hopkins University Press, Baltimore, 743 pp.

Slauson, K.M., R.L. Truex, and W.J. Zielinski. 2008. Determining the gender of American martens and fishers at track plate stations. Northwest Science 82(3):185-198.

Slauson, K.M., Zielinski, W.J., and M.K. Schwartz. 2017. Ski areas affect Pacific marten movement, habitat use, and density. Journal of Wildlife Management 81(5): 982-904.

Solis, D.M., Jr., and R.J. Gutiérrez. 1990. Summer habitat ecology of Northern Spotted Owls in northwestern California. Condor 92: 739–748.

Spencer, W.D., R.H. Barrett, and W.J. Zielinski. 1983. Marten habitat preferences in the northern Sierra Nevada. Journal of Wildlife Management 47(4):1181-1186.Spencer, W. and H. Rustigian-Romsos. 2012. Decision support maps and recommendations for conserving rare carnivores in the interior mountains of California. Conservation Biology Institute. 36 pp. + Appendices.

Spencer, W.D., R.H. Barrett, and W.J. Zielinski. 1983. Marten habitat preferences in the northern Sierra Nevada. Journal of Wildlife Management 47(4):1181-1186.

Spencer, W., S. Sawyer, H. Romsos, W. Zielinski, R. Sweitzer, C. Thompson, K. Purcell, D. Clifford, L. Cline, H. Safford, S. Brittling, and J. Tucker. 2015. Southern Sierra Nevada fisher conservation strategy. Unpublished report produced by Conservation Biology Institute. 117 pp.

Squires, J.R. and R.T. Reynolds. 1997. Northern Goshawk (*Accipiter gentilis*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/298.

Stalmaster, M.V. and J.L. Kaiser. 1998. Effects of recreational activity on wintering bald eagles. Wildlife Monographs 137:1-46.

Stalmaster, M.V., and J.R. Newman. 1978. Behavioral responses of wintering bald eagles to human activity. J. Wildl. Mgmt. 42:506-13.

Statham, M.J., A.C. Rich, S.K. Lisius, and B.N. Sacks. 2012. Discovery of a remnant population of Sierra Nevada red fox (*Vulpes vulpes necator*). Northwest Science 86(2):122–132. http://www.bioone.org/doi/full/10.3955/046.086.0204

Stebbings, R. E. 1966. Bats Under Stress. Studies in speleology 1(4): 168-173.

Stefani, R.A., H.L. Bombay, and T.M. Benson. 2001. Willow Flycatcher. Pages 143- 195 in USDA Forest Service, Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement, vol. 3, Ch. 3, Part 4.4. USDA Forest Service, Pacific Southwest and Intermountain Regions, Sacramento, CA.

Stihler, C.W and J.S. Hall. 1993. Endangered bat populations in West Virginia caves gated or fenced to reduce human disturbance. Bat Research News 34(4). [ABS].

Studier, E.H. and M.J. O'Farrell. 1972. Biology of Myotis thysanodes and M. lucifugus (Chiroptera: Vespertilionidae) – I. thermoregulation. Comparative Biochemistry and Physiology 41A: 567-595.Szewczak, J.M., S.M. Szewczak, M.L. Morrison, and L.S. Hall. 1998. Bats of the White and Inyo mountains of California-Nevada. Great Basin Naturalist 58(1):66-75.

Tempel, D.J. and R.J. Gutierrez. 2003. Fecal corticosterone levels in California spotted owls exposed to low-intensity chainsaw sound. Wildlife Society Bulletin 31(3):698-702.

Tempel, D.J. and R.J. Gutiérrez. 2004. Factors related to fecal corticosterone levels in California spotted owls: implications for assessing chronic stress. Conservation Biology 18(2):538-547.

Thiel, R.P. 1985. Relationship between road densities and wolf habitat suitability in Wisconsin. American Midland Naturalist 113(2): 404-407.

Thorp, R.W., and M.D. Shepherd. 2005. Profile: Subgenus Bombus. In Shepherd, M.D., D.M. Vaughan, and S.H. Black (eds). Red List of Pollinator Insects of North America. The Xerces Society for Invertebrate Conservation, Portland, OR.

Thorp, R. 2015. Personal communication between R. Thorp (Distinguished Professor Emeritus, Department of Entomology and Nematology, University of California Davis) and Katherine Malengo regarding hibernation habitat for western bumble bee (*Bombus occidentalis*). October 19, 2015.

Tipton, V. M. 1983. Evidence of movement of a maternity colony of *Plecotus townsendii virginianus* throughout the summer. Virginia Journal of Science, 35, 90.

Tommasi, D., A. Miro, H.A. Higo, and M.L. Winston. 2004. Bee diversity and abundance in an urban setting. The Canadian Entomologist 136:851–869.

Tumlison, R., and M. E. Douglas. 1992. Parsimony analysis and the phylogeny of the plecotine bats (Chiroptera: Vespertilionidae). Journal of Mammalogy 73(2):276-285.

U. S. Department of Agriculture Forest Service (USDA Forest Service). 1992. Land and Resource Management Plan Lassen National Forest. Pacific Southwest Region.

USDA Forest Service. 1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl.

USDA Forest Service. 2001. Sierra Nevada Forest plan amendment: final environmental impact statement. Department of Agriculture, Forest Service, Pacific Southwest Region. 2001. Vallejo, CA. http://www.fs.usda.gov/detail/r5/landmanagement/planning/?cid=stelprdb5415847 .

USDA Forest Service. 2004. Sierra Nevada Forest plan amendment: final supplemental environmental impact statement; record of decision. Vallejo, CA. Available online at: http://www.fs.fed.us/r5/snfpa/final-seis/index.html (accessed May 14, 2009).

USDA Forest Service. 2009. Final environmental impact statement – motorized travel management – Lassen National Forest, Butte, Lassen, Modoc, Plumas, Shasta, Tehama, and Siskiyou Counties, California. R5-MB-207. 677 pp.

USDA Forest Service. 2010. Biological Assessment and Evaluation for Wildlife Species, Motorized Travel Management Final Environmental Impact Statement. Lassen National Forest.

USDA Forest Service. 2011. Motor vehicle use map, Lassen National Forest. 1 p.

USDA Forest Service. 2014a. Lassen National Forest personal fuelwood and Christmas tree cutting map. November 14, 2014 to December 31, 2015. 1 p.

USDA Forest Service. 2014b. Pacific Southwest Region, sensitive animal species by forest. Updated 10/10/2014.

USDI Bureau of Land Management (BLM). 1999. Field guide to survey and manage terrestrial mollusk species from the northwest forest plan. Bureau of Land Management, Oregon State Office. 126 pp.

USDI Fish and Wildlife Service. 1984. Valley elderberry longhorn beetle recovery plan. U.S. Fish and Wildlife Service, Portland, OR. 62 pp.

USDI Fish and Wildlife Service (USFWS). 1986. Pacific bald eagle recovery plan. Portland, OR. 172 pp.

USDI Fish and Wildlife Service. 1987. Northern Rocky Mountain wolf recovery plan. U.S. Fish and Wildlife Service, Denver, CO. 119 pp.

USDI Fish and Wildlife Service. 1998. Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act.

USDI Fish and Wildlife Service. 2006. 50 CFR Part 17. Endangered and Threatened Wildlife and Plants; 12-month finding for a petition to list the California spotted owl (*Stirx occidentalis occidentalis*) as threatened or endangered. Federal Register. Vol 71, No 100, May 24, 2006.

USDI Fish and Wildlife Service. 2007. Bald eagle management guidelines and conservation measures.

USDI Fish and Wildlife Service. 2009a. Giant garter snake species account. 2 pp.

USDI Fish and Wildlife Service. 2009b. Regulatory and Scientific Basis for U.S. Fish and Wildlife Service Guidance for Evaluation of Take for Northern Spotted Owls on Private Timberlands in California's Northern Interior Region. Unpublished report.

USDI Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; designation of revised critical habitat for the northern spotted owl; final rule. Federal Register 77(233):71876-72068.

USDI Fish and Wildlife Service. 2013. Endangered and Threatened Wildlife and Plants; Threatened Status for the Distinct Population Segment of the North American Wolverine Occurring in the Contiguous United States. Federal Register 78(23):7864-7890.

USDI Fish and Wildlife Service. 2014a Endangered and Threatened Wildlife and Plants; Threatened Species Status for West Coast Distinct Population Segment of Fisher; Proposed Rule. Federal Register 79(194):60419-60443.

USDI Fish and Wildlife Service. 2014b. Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule To Remove the Valley Elderberry Longhorn Beetle From the Federal List of Endangered and Threatened Wildlife; Proposed Rule. Federal Register 79(180):55874-55917.

USDI Fish and Wildlife Service. 2015a. Greater sandhill crane – Ruby Lake. 2 pp.

USDI Fish and Wildlife Service. 2015b. Species report: Sierra Nevada red fox (*Vulpes vulpes necator*). Accessed online at: https://www.fws.gov/sacramento/outreach/2015/10-07/docs/20150814_SNRF_SpeciesReport.pdf. 78 pp.

USDI Fish and Wildlife Service. 2015c. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a petition to list Sierra Nevada red fox as an endangered or threatened species. 163 pp.

USDI Fish and Wildlife Service. 2016a. Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule to List the West Coast Distinct Population segment of Fisher. Federal Register 81(74):22710-22808.

USDI Fish and Wildlife Service. 2016b. Email correspondence between Katherine Fitzgerald, Endangered Species Biologist, U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office, Lacey, WA, and Tom Rickman, Wildlife Biologist, Eagle Lake Ranger District, describing the fisher habitat model developed for the USFWS status assessment of the West Coast DPS of fisher, including use constraints. April 18, 2016. 1 page.

USDI Fish and Wildlife Service. 2018a. Lassen National Forest over-snow vehicle use designation updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project. Klamath Falls Fish and Wildlife Office. 17 pp.

USDI Fish and Wildlife Service. 2018b. Lassen National Forest over-snow vehicle use designation updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project. Nevada Fish and Wildlife Office. 23 pp.

USDI Fish and Wildlife Service. 2018c. Lassen National Forest over-snow vehicle use designation updated list of threatened and endangered species that may occur in your proposed project

location, and/or may be affected by your proposed project. Sacramento Fish and Wildlife Office. 8 pp.

USDI Fish and Wildlife Service. 2018d. Lassen National Forest over-snow vehicle use designation updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project. Yreka Fish and Wildlife Office. 23 pp.

USDI National Park Service. 2013. Yellowstone National Park Winter Use Plan /Supplemental Environmental Impact Statement Wyoming, Montana, Idaho. Chapter 3, Pages 90-91.

Van Riper III, C., J.J. Fontaine, and J.W. van Wagtendonk. 2013. Great gray owls (*Strix nebulosa*) in Yosemite National Park: on the importance of food, forest structure, and human disturbance. Natural Areas Journal 33(3):286-295.

van Zyll de Jong, C. G. 1985. Handbook of Canadian mammals, volume 2: bats. National Museum of Natural Sciences, National Museums of Canada, Ottawa, Ontario, Canada.

Vander Haegen, W. M., S. L. Clark, K. M. Perillo, D. P. Anderson, and H. L. Allen. 2009. Survival and causes of mortality of head-started western pond turtles on Pierce National Wildlife Refuge, Washington. Journal of Wildlife Management 73:1402-1406.

Vaughan, T.A., and T.J. O'Shea. 1976. Roosting ecology of the pallid bat, *Antrozous pallidus*. Journal of Mammalogy 57(1):19-42.

Verner, J., K.S. McKelvey, B.R. Noon, R.J. Gutiérrez, G.I. Gould, and T.W. Beck. 1992. The California spotted owl: a technical assessment of its current status. Gen. Tech. Rep. PSW-GTR-133. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 285 pp.

Ward, J.P., R.J. Gutierrez, and B.R. Noon. 1998. Habitat selection by Northern Spotted Owls: the consequences of prey selection and distribution. Condor 100: 79–92.

Wasser, S.K., K. Bevis, G. King, and E. Hanson. 1997. Noninvasive physiological measures of disturbance in the Northern Spotted Owl. Conservation Biology 11(4):1019-1022.

Weathers, W.W., P.J. Hodum, and J.A. Blakesley. 2001. Thermal ecology and ecological energetics of California spotted owls. Condor 103: 678-690.

Weir, R. D. and F. B. Corbould. 2007. Factors affecting diurnal activity of fishers in north-central British Columbia. Journal of Mammalogy 88:1508–1514.

Weller, T.J. and C.J. Zabel. 2001. Characteristics of fringed myotis day roosts in northern California. Journal of Wildlife Management 66(3):489-497.

Wengert, G.M., M.W. Gabriel, S.M. Matthews, J.M. Higley, R.A. Sweitzer, C.M. Thompson, K.L. Purcell, R.H. Barrett, L.W. Woods, R.E. Green, S.M. Keller, P.M. Gaffney, M. Jones, and B.N. Sacks. 2014. Using DNA to describe and quantify interspecific killing of fishers in California. Journal of Wildlife Management 78(4):603-611.

White, P.J., J.J. Borkowski, T. Davis, R.A. Garrott, D.P. Reinhart, and D.C. McClure. 2009. Chapter 26: Wildlife Responses to Park Visitors in Winter. In Terrestrial Ecology: The Ecology of Large Mammals in Central Yellowstone—Sixteen Years of Integrated Field Studies, vol. 3, edited by R.A. Garrott, P.J. White, and F.G.R. Watson, 581–601. Elsevier. San Diego, California.

Whitaker J.O. Jr., C. Maser, and L.E. Keller. 1977. Food habits of bats of western Oregon. Northwest Scientist 51:46–55.

Whitaker J.O. Jr., C. Maser, S.P. Cross. 1981. Food habits of eastern Oregon bats, based on stomach and scat analyses. Northwest Scientist 55:281–292.

Whittington, J., C.C. St. Clair, and G. Mercer. 2005. Spatial responses of wolves to roads and trails in mountain valleys. Ecological Applications 15(2):543-553.

Williams, P.J., R.J. Gutierrez, and S.A. Whitmore. 2011. Home range and habitat selection of spotted owls in the central Sierra Nevada. Journal of Wildlife Management 75(2):333-343.

Wilson, D.E. 1982. Wolverine. Pages 644-652 in J.A. Chapman and G.A. Feldhamer, editors. Wild mammals of North America. Biology, management and economics. Johns Hopkins University Press, Baltimore, Maryland.

Witmer, G.W., S.K. Martin, and R.D. Sayler. 1998. Forest carnivore conservation and management in the interior Columbia basin: issues and environmental correlates. Gen. Tech. Rep. PNW-GTR-420. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 51 pp.

Woodbridge, B., and C.D. Hargis. 2006. Northern Goshawk inventory and monitoring technical guide. USDA Forest Service, WO GTR-71. 63 pp.

Woodbridge, B., and P. J. Detrich. 1994. Territory occupancy and habitat patch size of Northern Goshawks in the southern Cascades of California. Studies in Avian Biology 16:83–87.

Wu, J.X., R.B. Siegel, H.L. Loffland, M.W. Tingley, S.L. Stock, K.N. Roberts, J.J. Keane, J.R. Medley, R. Bridgman, and C. Stermer. 2015. Diversity of Great Gray Owl Nest Sites and Nesting Habitats in California. Journal of Wildlife Management 79(6):937-947.

Younk, J.V. and M.J. Bechard. 1994. Breeding ecology of the northern goshawk in high-elevation aspen forests of northern Nevada. pp. 119-121 In W.M. Block, M.L. Morrison, and M.H. Reiser [eds.]. The Northern Goshawk: ecology and management: proceedings of a symposium of the Cooper Ornithological Society, Sacramento, California, 14-15 April 1993. Studies in Avian Biology No.16. Cooper Ornithological Society, Camarillo, CA.

Zielinski, W. 2015. Personal communication between William (Bill) Zielinski (Research Ecologist, PSW Redwood Sciences Lab) March 26, 2015, with Katherine Malengo regarding potential impacts of OSV use on martens and marten den sites in the Sierra Nevada of California.

Zielinski, W.J. 2014. The forest carnivores: marten and fisher. In: Long, J.W.; Quinn-Davidson, L.; Skinner, C.N., eds. Science synthesis to support socioecological resilience in the Sierra Nevada and southern Cascade Range. Gen. Tech. Rep. PSW-GTR-247. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station: 393-435. Chap. 7.1.

Zielinski, W.J., K.M. Moriarty, J. Baldwin, T.A. Kirk, K.M. Slauson, H.L. Rustigian-Romsos, W.D. Spencer. 2015. Effects of season on occupancy and implications for habitat modeling: the Pacific marten *Martes caurina*. Wildlife Biology 21:56-67.

Zielinski, W.J., K.M. Slauson, and A.E. Bowles. 2007. The Effect of Off-Highway Vehicle Use on the American Marten in California, USA. Final Report to the USDA Forest Service, Pacific

Southwest Region, and California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division. Sacramento.

Zielinski, W.J., K.M. Slauson, and A.E. Bowles, 2008. Effects of off-highway vehicle use on the American marten. Journal of Wildlife Management 72(7):1558-1571.

Zielinski, W.J., R.L. Truex, F.V. Schlexer, L.A. Campbell, and C. Carroll. 2005. Historical and contemporary distribution of carnivores in forests of the Sierra Nevada, California, USA. Journal of Biogeography 32:1385-1407.

Zielinski, W.J., J.M. Tucker, and K.M. Rennie. 2017. Niche overlap of competing carnivores implications of climate change at geographic range margins. Biological Conservation 209(2017): 533-535.

Migratory Birds

California Department of Parks and Recreation. 2010. Over-snow vehicle program final environmental impact report, program years 2010-2020. California Department of Parks and Recreation, Off-highway Motor Vehicle Recreation Division. 156 pp.

CalPIF (California Partners in Flight). 2002. Version 2.0. The oak woodland bird conservation plan: a strategy for protecting and managing oak woodland habitats and associated birds in California (S. Zack, lead author). Point Reyes Bird Observatory, Stinson Beach, CA. http://www.prbo.org/calpif/plans.html.

CalPIF (California Partners in Flight). 2004. Version 2.0. The Coastal Scrub and Chaparral Bird Conservation Plan: a Strategy for Protecting and Managing Coastal Scrub and Chaparral Habitats and Associated Birds in California (J. Lovio, lead author). PRBO Conservation Science, Stinson Beach, CA. http://www.prbo.org/calpif/plans.html.

CDFW (California Department of Fish and Wildlife). 2017. Species Explorer website. Accessed 03/29/2017 at: https://nrm.dfg.ca.gov/taxaquery/Default.aspx.

Gyug, L.W., R.C. Dobbs, T.E. Martin and C.J. Conway. 2012. Williamson's sapsucker (*Sphyrapicus thyroideus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/wilsap.

Hayward, L.S., A.E. Bowles, J.C. Ha, and S.K. Wasser. 2011. Impacts of acute and long-term vehicle exposure on physiology and reproductive success of the northern spotted owl. Ecosphere. 2(6): article 65.

Johnson, R.E. 2002. Black rosy-finch (*Leucosticte atrata*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/bkrfin.

Mellen-McLean, K., B. Wales, and B. Bresson. 2013. A conservation assessment for the white-headed woodpecker (*Picoidees albolarvatus*). USDA Forest Service, Region 6, USDI Bureau of Land Management, Oregon and Washington. 41 pp.

Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, M.S.W. Bradstreet, G.S. Butcher, D.W. Demarest, E.H. Dunn, W.C. Hunter, E.E. Iñigo-Elias, J.A. Kennedy, A.M. Martell, A.O. Panjabi, D.N.

Pashley, K.V. Rosenberg, C.M. Rustay, J.S. Wendt, and T.C. Will. 2004. Partners in Flight North American Landbird Conservation Plan. Cornell Lab of Ornithology. Ithaca, NY.

Shuford, W.D. and T. Gardali, editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento. Accessed online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=10382.

Tempel, D.J. and R.J. Gutierrez. 2003. Fecal corticosterone levels in California spotted owls exposed to low-intensity chainsaw sound. Wildlife Society Bulletin 31(3):698-702.

USDA Forest Service. 1992. Land and resource management plan, Lassen National Forest. Pacific Southwest Region.

USDA Forest Service. 2000. Landbird strategic plan, FS-648. Washington, D.C.

USDA Forest Service, USDI Fish and Wildlife Service. 2008. Memorandum of Understanding between the U.S. Department of Agriculture Forest Service and the U.S. Fish and Wildlife Service to promote the conservation of migratory birds. FS Agreement #08-MU-1113-2400-264. Washington, D.C.

USDI Fish and Wildlife Service. 2007. Bald eagle management guidelines and conservation measures.

USDI Fish and Wildlife Service. 2008. Birds of conservation concern. Division of Migratory Bird Management, Arlington, Virginia. 87 pp.

Management Indicator Wildlife Species

CDFG (California Department of Fish and Game). 2005. California Department of Fish and Game and California Interagency Wildlife Task Group. California Wildlife Habitat Relationships (CWHR) version 8.1. personal computer program. Sacramento, California. On-Line version. http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.asp. (Accessed: January 3, 2008).

California Department of Parks and Recreation. 2010. Over-snow vehicle program final environmental impact report, program years 2010-2020. California Department of Parks and Recreation, Off-highway Motor Vehicle Recreation Division. 156 pp.

Frazier J.W., K.B. Roby, J.A. Boberg, K. Kenfield, J.B. Reiner, D.L. Azuma, J.L. Furnish, B.P. Staab, S.L. Grant. 2005. Stream Condition Inventory Technical Guide. USDA Forest Service, Pacific Southwest Region - Ecosystem Conservation Staff. Vallejo, CA. 111 pp.

Hawkins, C.P. 2003. Development, evaluation, and application of a RIVPACS-type predictive model for assessing the biological condition of streams in Region 5 (California) national forests. Completion Report. Western center for Monitoring and Assessment of Fresh Water Ecosystems. Utah State University. Logan, Utah, 23 pp.

Mayer, K.E., and W.F. Laudenslayer, eds. 1988. A Guide to Wildlife Habitats of California. California Department of Forestry and Fire Protection, Sacramento, CA. 166 pp. http://www.dfg.ca.gov/biogeodata/cwhr/wildlife_habitats.asp

USDA Forest Service. 2001. Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement. Forest Service, Pacific Southwest Region. January 2001. http://www.fs.fed.us/r5/snfpa/library/archives/feis/index.htm

USDA Forest Service. 2006a. Draft - MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination, May 25, 2006. Pacific Southwest Region. 3 pp.

USDA Forest Service. 2007a. Record of Decision, Sierra Nevada Forests Management Indicator Species Amendment. U.S. Forest Service, Pacific Southwest Region. December, 2007. 18 pp.

USDA Forest Service. 1992. Land and resource management plan, Lassen National Forest. Pacific Southwest Region.

USDA Forest Service. 2010a. Sierra Nevada Forests Bioregional Management Indicator Species (MIS) Report: Life history and analysis of Management Indicator Species of the 10 Sierra Nevada National Forests: Eldorado, Inyo, Lassen, Modoc, Plumas, Sequoia, Sierra, Stanislaus, and Tahoe National Forests and the Lake Tahoe Basin Management Unit. Pacific Southwest Region, Vallejo, CA. December 2010. 132 pp.

Survey and Manage Wildlife Species

Bureau of Land Management. 1999. Field guide to survey and manage terrestrial mollusk species from the northwest forest plan. Bureau of Land Management, Oregon State Office. 126 pp.

NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org.

USDA Forest Service (USDA FS); USDI Bureau of Land Management (USDI BLM). 2001. Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures, Standards and Guidelines. Portland, Oregon. January, 2001.

Fisheries and Aquatic Resources

Adams, E.S. 1975: Effects of lead and hydrocarbons from snowmobile exhaust on brook trout (Salvelinus fontinalis). Trans Amer. Fisheries Soc. 104(2): 363-373.

Arnold, J. L., and T.M. Koel. 2007. Effects of Snowmobile Emission on the Chemistry of Snowmelt Runoff in Yellowstone National Park. Final Report. Fisheries and Aquatic Sciences Section, Center for Resources, Yellowstone National Park, Wyoming. YCR-2006-1.

Bradford, D.F. 1983. Winterkill, oxygen relations, and energy metabolism of a submerged dormant amphibian, *Rana muscosa*. Ecology 64(5):1171–1183.

Bradford, D.F. 1984. Temperature modulation in a high-elevation amphibian, *Rana muscosa*. Copeia 1984(4):966–976.

Brim Box, J. 2002. A survey of the aquatic mollusk species of the Lassen National Forest, Final Report submitted to the USDA/FS, June 21, 2002. Contract FSA 01-IA-11050650-020. Susanville, CA.

Brim Box, J., S. Chappell, M. McFarland, and J. Furnish. 2005. The aquatic mollusk fauna of the Lassen National Forest in northeastern California. USFS PSW Regional Office Report, Vallejo, CA. 117 pp.

Brown, H. 2000. Personal communication. Fisheries Biologist (formerly), Lassen National Forest, Almanor Ranger District, 900 E. Hwy 36, PO Box 767, Chester, CA 96020.

California Department of Parks and Recreation. Off Highway Motor Vehicle Recreation Division. 2010. Over Snow Vehicle Program. Final Environmental Impact Report Program Years 2010 – 2020. State Clearinghouse # 2009042113. December 2010.

Davenport, J. and T.A. Switalski. 2006. Environmental impacts of transport related to tourism and leisure activities. Chapter 14 in J. Davenport and J. A. Davenport (eds.) The ecology of transportation: managing mobility for the environment. Springer, Dordrecht. Netherlands.

Davidson, B. 2017. Botany Report for Lassen National Forest Over-Snow Vehicle Use Designation Draft Environmental Impact Statement. Unpublished report. USDA Forest Service, Lassen National Forest, Susanville, California.

Eagleston, H. and C. Rubin. 2013. Non-motorized winter recreation impacts to snowmelt erosion, Tronsen Basin, Eastern Cascades, Washington. Environmental Management 51: 167-181.

Fahey, B. and K. Wardle. 1998. Likely impacts of snow grooming and related activities in the West Otago ski fields. Science for Conservation: 85. New Zealand Department of Conservation.

Fellers, G.M. and C.A. Drost. 1993. Disappearance of the Cascades frog *Rana cascadae* at the southern end of its range, California, USA. Biological Conservation 65: 177-181.

Fellers, G.M. 1995. Aquatic amphibian surveys, Lassen National Forest. Point Reyes, CA: U.S. Geological Survey, Biological Resources Division, Point Reyes National Seashore.

Fellers, G.M. 1998. 1996-97 aquatic amphibian surveys, Lassen National Forest. Point Reyes, CA: U.S. Geological Survey, Biological Resources Division, Point Reyes National Seashore.

Fellers, G.M., K.L. Pope, J.E. Stead, M. Koo and H. Welsh, Jr. 2008. Turning population trend monitoring into active conservation: can we save the Cascades frog (Rana cascadae) in the Lassen region of California? Herpetological Conservation and Biology. 3(1): 28-39.

Frest, T.J. and E. J. Johannes. 1995. Freshwater Mollusks of the Upper Sacramento System, California, with Particular Reference to the Cantara Spill. 1994 Yearly report to California Department of Fish and Game. Deixis Consultants, Seattle, Washington.

Gage, E. and D.J. Cooper. 2013. Evaluating snow compaction effects to fen wetlands on Rabbit Ears and Buffalo Pass of the Routt National Forest. Prepared for the Arapaho-Roosevelt National Forests, the White River National Forest, and the Black Hills National Forest.

Garwood, J.M. 2009. Spatial ecology of the Cascades frog: identifying dispersal, migration, and resource uses at multiple spatial scales. Arcata, CA: Humboldt State University. 97 p. M.S. thesis.

Greller, A.M., M. Goldstein, and L. Marcus. 1974. Snowmobile impact on three alpine tundra plant communities. Environmental Conservation 1(2): 101–110.

Grinnell, J., J. Dixon, and J.M. Linsdale. 1930. Vertebrate natural history of a section of northern California through the Lassen Peak region. University of California Press, Berkeley, California.

Ingersoll, G., J. Turk, C. McClure, S. Lawlor, D. Clow, and A. Mast. 1997. Snowpack chemistry as an indicator of pollutant emission levels from motorized winter vehicles in Yellowstone National Park, Proceedings of 65th Annual Meeting of Western Snow Conference, May 4-8, 1997, Banff, Alberta.

Ingersoll, G. 1998. Effects of snowmobile use on snowpack chemistry in Yellowstone National Park, USGS, Department of Interior, Water-Resources Investigation Report 99-4148.

Ingersoll, G.P. 1999: Effects of snowmobile use on snowpack chemistry in Yellowstone National Park, 1998. US Geological Survey Water Resources Investigations Repot 99-4148. 24 pp.

Interagency Cooperation – Endangered Species Act of 1973, as amended, 50 C.F.R. § 402.02 (2008).

Interagency Cooperation – Endangered Species Act, Title 16 U.S. Code, Pts. 1536. 2004 ed.

Keddy, P.A., A.J. Spavold, and C.J. Keddy. 1979; Snowmobile Impact on Old Field and March Vegetation in Nova Scotia Canada: An Experimental Study. Environmental Management 3(5): 409-415.

Koo, M.S., J.V. Vindum, and M. McFarland. 2004. Results of 02-CS-11050650-029, the 2003 California Academy of Sciences survey: amphibians and reptiles of the Lassen National Forest. San Francisco, CA: California Academy of Sciences, Department of Herpetology. 172 pp.

Matthews, K.R. and C. Miaud. 2007. A skeletochronological study of the age structure, growth, and longevity of the mountain yellow-legged frog, *Rana muscosa*, in the Sierra Nevada, California. Copeia 2007:986–993.

Matthews, K.R. and K.L. Pope. 1999. A telemetric study of the movement patterns and habitat use of *Rana muscosa*, the mountain yellow-legged frog, in a high-elevation basin in Kings Canyon National Park, California. Journal of Herpetology 33(4):615–624.

Matthews, K.R. and H.K. Preisler. 2010. Site fidelity of the declining amphibian *Rana sierrae* (Sierra Nevada yellow-legged frog). Canadian Journal of Fisheries and Aquatic Sciences 67:243–255.

McNamara, M. 2018. Hydrology Report for Lassen National Forest Over-Snow Vehicle Use Designation Draft Environmental Impact Statement. Unpublished report. USDA Forest Service, Lassen National Forest, Susanville, California.

Mullally, D. P. and J. D. Cunningham. 1956. Ecological relations of Rana muscosa at high elevations in the Sierra Nevada. Herpetological 12:189–198.

Musselman, R.C., and J.L. Korfmacher. 2007. Air quality at a snowmobile staging area and snow chemistry on and off trail in a Rocky Mountain subalpine forest, Snowy Range, Wyoming. Environmental monitoring and assessment 133(1-3), 321-334.

National Oceanic and Atmospheric Administration website. NOAA Fisheries, West Coast Region. Map of critical habitat, Central Valley Spring-run Chinook Salmon. http://www.westcoast.fisheries.noaa.gov/publications/gis_maps/maps/salmon_steelhead/critical_habitat/chin/chinook_cvsr.pdf

Neumann, P.W., and H.G. Merriam. 1972. Ecological effects of snowmobiles. Canadian Field Naturalist 86:207-212.

Pope, K. 2008. Population monitoring of remnant populations of Cascades frog (*Rana cascadae*) in the Lassen region of California. Final report to the Lassen National Forest. Unpublished document. U.S. Department of Agriculture, Pacific Southwest Research Station, Redwood Sciences Laboratory.

Pope, K., C. Brown, M. Hayes, G. Green, and D. Macfarlane, , tech. coords. 2014. Cascades frog conservation assessment. Gen. Tech. Rep. PSW-GTR-244. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 116 pp. Available online at: https://www.fs.fed.us/psw/publications/documents/psw_gtr244/

Pope, K.L. and K.R. Matthews. 2001. Movement ecology and seasonal distribution of mountain yellow-legged frogs, *Rana muscosa*, in a high-elevation Sierra Nevada basin. Copeia 2001:787–793.

Roby, K. 2002. Personal communication. Fisheries biologist (formerly). Lassen National Forest, Almanor Ranger District, 900 E. Hwy 36, PO Box 767, Chester, CA 96020.

Stead, J.E. and K.L. Pope. 2007. Cascades frog Breeding and Aquatic Leeches in the Mt. Lassen Region, California. Final Report: Submitted to the USDA Forest Service, Lassen National Forest. 19 pp.

Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. 2nd edition, revised. Houghton Mifflin, Boston. 336 pp.

U.S. Department of Agriculture Forest Service (USDA Forest Service). 1992. Lassen National Forest Land and Resource Management Plan. Lassen National Forest. Susanville, California.

USDA Forest Service. 1999. Executive Order 13112. Presidential Documents, Invasive Species, President William Clinton. Federal Register Vol. 64, No. 25, February 8, 1999.

USDA Forest Service. 2000. Water quality management for forest system lands in California: best management practices. Pacific Southwest Region, Vallejo, CA. 138 pp.

USDA Forest Service. 2001b. Sierra Nevada Forest Plan Amendment, Final Environmental Impact Statement.

USDA Forest Service. 2001c. Sierra Nevada Forest Plan Amendment. Final Environmental Impact Statement, Record of Decision, Pacific Southwest Region, Jan 2001

USDA Forest Service. 2004. Record of Decision for Sierra Nevada Forest Plan Amendment.

USDA Forest Service. 2005. Forest Service Manual 2670-2671. Threatened, Endangered and Sensitive Plants and Animals. Chapter 2670. National Headquarters, Washington, DC. Effective: September 23, 2005.

USDA Forest Service. 2010. Existing Environment for Federally-listed (non-anadromous) and Forest Service Sensitive Aquatic Species, Part D: Federally-listed (non-anadromous) Aquatic Species**.** Unpublished internal document. Lassen National Forest. Version 4.29.10.

USDA Forest Service. 2012. National Best Management Practices for Water Quality Management on National Forest System Lands. Volume 1: National Core BMP Technical Guide. FS-990a. 177 pp.

USDA Forest Service. 2014. Use by Over-snow Vehicles (Travel Management Rule). Federal Register, June 18, 2014. 79(117): 34678-34681.

USDI Fish and Wildlife Service. 2007a. Conservancy Fairy Shrimp (*Branchinecta conservatio*) Five-year Review: Summary and Evaluation. Sacramento Fish and Wildlife Office, Sacramento, CA. 32 pp.

USDI Fish and Wildlife Service. 2007b Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) Five-year Review: Summary and Evaluation. Sacramento Fish and Wildlife Office, Sacramento, CA. 76 pp.

USDI Fish and Wildlife Service. 2007c. Vernal Pool Tadpole Fairy Shrimp (*Lepidurus packardi*) Five-year Review: Summary and Evaluation. Sacramento Fish and Wildlife Office, Sacramento, CA. 50 pp.

USDI Fish and Wildlife Service (USFWS). 2015a. Lassen National Forest Over-Snow Vehicle Use Designation Project Official Species List. Klamath Falls Fish and Wildlife Office. Klamath Falls, Oregon. September 29, 2015.

USDI Fish and Wildlife Service (USFWS). 2015b. Lassen National Forest Over-Snow Vehicle Use Designation Project Official Species List. Sacramento Fish and Wildlife Office. Sacramento, California. September 29, 2015.

USDI Fish and Wildlife Service (USFWS). 2015c. Lassen National Forest Over-Snow Vehicle Use Designation Project Official Species List. Yreka Fish and Wildlife Office. Yreka, California. September 29, 2015.

USDI Fish and Wildlife Service (USFWS). 2015d. Lassen National Forest Over-Snow Vehicle Use Designation Project Official Species List. Nevada Fish and Wildlife Office. Reno, Nevada. September 29, 2015.

Vredenburg, V.T., R. Bingham, and R.A. Knapp. 2007. Concordant molecular and phenotypic data delineate new taxonomy and conservation priorities for the endangered mountain yellow-legged frog. Journal of Zoology 271:361–374.

Winter Wildlands Alliance (WWA). 2009. Seeing the Forest and the Trees – Assessing Snowmobile Damage in National Forests. A Report by Winter Wildlands Alliance. November, 2009. 3 pp.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, editors. 1988. California's Wildlife. Vol. I-III. California Department of Fish and Game, Sacramento, California.

Zweifel, R.G. 1955. Ecology, distribution, and systematics of frogs of the Rana boylei group. University of California Publications on Zoology 54:207-29

Index

Appendix A. Scoping Comment Categories

Subject	Approximate Percentage of Comments
Wildlife	20%
Watersheds (soil and water)	8%
Transportation	1%
Socioeconomics	6%
Recreation	36%
Noise	7%
National Forest Management Act	<1%
National Environmental Policy Act	4%
Fisheries	1%
Climate Change	<1%
Botany	7%
Air Quality	8%
Total	**100%**

Public Scoping Classification Code Definitions

Identification of Issues	Description	Classification Code
Significant (or Key) Issues (Write an issue statement)	A point of disagreement, debate, or dispute over a proposed action based on environmental effects that can often be resolved by developing an alternative to the proposed action, modifying the proposed action in some way, and/or developing site-specific non-routine mitigation measures or design features. OR The issue cannot be adequately addressed with standard mitigation and is not resolved by existing management guidance or direction. An issue should describe a specific action and the environmental effect(s) expected to result from that action – "Cause-effect." Key issues are those most relevant to the analysis (significant issues should only be used when referring to significant environmental effects (SEE), which are addressed in an EIS. For an EA, if you have SEE, you will need to do an EIS.)	1.1 Or 2.1
Alternatives (Don't need to write an issue statement but should address these comments)	A new alternative suggested by the public or another agency or group or a new alternative component suggested. OR Suggestions for changes to the alternatives or the proposed action.	3.1
Nonsignificant (Non-Key) Issues: A point of disagreement, debate or dispute over a proposed action based on environmental effects that falls into one of these categories. (Don't write an IS; however, need to identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (1506.3), narrowing the discussion of these issues in the statement to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere (40 CFR 1501.7(a)(3)), and FSH 1509.15 (12.41)).	Already decided by law, regulation or policy	4.1
	Irrelevant to the decision to be made	4.2
	Conjectural in nature or not supported by scientific evidence	4.3
	Impacts are limited in extent, duration, and intensity due to project design or limited nature of impact	4.4
	Can be addressed through implementation of routine or standard project design features or mitigation measures	4.5
	Outside the scope of the proposed action	4.6
Suggestion/comment or procedural concern (Don't need to write an issue statement but should briefly address these comments)	General concerns, questions, or suggestions not specifically related to the proposed action's effects.	5.1
Document specific comments and/or document corrections (Don't need to write an issue statement but should briefly address these comments)	If we need to identify the document specific comments, we would need to set up "categories" that are specific to the resource or by some categories identified in the coding structure. Document specific comments especially if the proposed action is specific. Also includes document corrections or factual information corrections.	6.1

Appendix B. Forest Plan Direction and 36 CFR §212.55

OHV Management Practices Emphasized and Permitted in each Forest Plan Management Prescription (1992 Forest Plan)

Forestwide Standards and Guidelines

Recreation

Provide diverse opportunities of winter sports.

1. Continue to implement the preferred alternative of the 1989 Winter OHV Management Plan, for the construction of trailheads and trail networks for winter recreation.

2. Cooperate with the State of California to identify locations where snow removal is needed to accommodate safe, off-highway parking for dispersed winter use.

3. Designate and mark trails needed for additional dispersed winter recreation.

5. Accommodate snowmobile use over most of the Forest where not in conflict with other uses or resources. Due to the dispersed nature of the activities, do not provide regular patrols. Provide first aid services only as Forest personnel happen to be available.

6. Minimize user conflicts by specifying allowable winter use on certain roads and trails (for example cross-country ski trails, snowmobile-only trails or winter 4-wheel drive only.

7. Prohibit snow removal on designated snowmobile and cross-country ski trails between specified dates (Forest Plan, pages 4-25-26).

Restricted Off-Highway Vehicle Use: This practice involves control of off-highway vehicle use. Use can be seasonally prohibited or restricted to designated routes (Forest Plan, Appendix E, page E-4).

Management Prescription	Description	OHV Management Practices		Other Relevant Direction
		Emphasized	Permitted	
A (page 4-40)	Non-Timber Wildlife	None	Restricted Off-Highway Vehicle Use	Seasonally close roads where necessary to protect wildlife during critical periods Manage recreation according to the specified Recreation Opportunity Spectrum classes (See Forest Standards and Guidelines)
B (page 4-42)	Range/ Wildlife	None	Restricted Off-Highway Vehicle Use	Manage recreation according to the specified Recreation Opportunity Spectrum class, which is primarily Roaded Natural
C (page 4-44)	Firewood	None	Restricted Off-Highway Vehicle Use	Manage recreation according to Recreation Opportunity Spectrum class of Roaded Natural (see Forest Standards and Guidelines)
D (page 4-45)	Developed Recreation	Restricted Off-Highway Vehicle Use		
E (page 4-48)	Early Successional	Restricted Off-Highway Vehicle Use		Close roads to motorized vehicles as appropriate to meet the needs of deer, black bear, and other emphasized species listed in the Management Area direction. Manage recreation according to the Recreation Opportunity Spectrum class of Roaded Natural (see Forest Standards and Guidelines)
F (page 4-50)	Riparian/ Fish	None	Restricted Off-Highway Vehicle Use	Confine off-highway vehicles, except over-snow vehicles, to designated roads, trails, and stream crossings in riparian areas.
G (page 4-54)	Old Growth/ Goshawk	Restricted Off-Highway Vehicle Use		Manage recreation according to the Recreation Opportunity Spectrum classes of Semi-Primitive Non-Motorized, Semi-Primitive Motorized, or Roaded Natural (see Forest Standards and Guidelines).
K (page 4-56)	Rocky/ Sparse Timber	None	Restricted Off-Highway Vehicle Use	Manage recreation according to the Recreation Opportunity Spectrum classes of Semi-Primitive Nan-Motorized and Roaded Natural (see Forest Standards and Guidelines)
L (page 4-58)	Late Successional	None	Restricted Off-Highway Vehicle Use	Manage recreation according to the Recreation Opportunity Spectrum classes of semi- Primitive Non-Motorized, Semi-Primitive Motorized, or Roaded Natural (see Forest Standards and Guidelines)

Management Prescription	Description	OHV Management Practices		Other Relevant Direction
		Emphasized	Permitted	
M (page 4-60)	Semi-Primitive Motorized	Restricted Off-Highway Vehicle Use		Design motorized routes to take advantage of recreation and scenic opportunities, insure successful rehabilitation of soil and vegetation, and provide motorized recreation challenges. Close specific areas or travel routes seasonally or year-round as needed to facilitate management of adjacent areas, prevent damage to other resources, prevent use conflicts, and avoid unnecessary costs Monitor and limit visitor use through a quota permit system when other resources are damaged or recreation experiences are reduced
N (page 4-63)	Semi-Primitive Non-Motorized	Restricted Off-Highway Vehicle Use		Design trails to take advantage of recreation attributes such as vistas, streams, lakes, and areas of geologic interest. Monitor and limit visitor use when other resources are damaged or recreation experiences are reduced. Prohibit motorized recreation, including four-wheel driving, motorcycling, and snowmobiling.
R (page 4-66)	Range	None	Restricted Off-Highway Vehicle Use	Manage recreation according to the specified Recreation Opportunity Spectrum class, which is primarily Roaded Natural (see Forest Standards and Guidelines).
S (page 4-68)	Special Areas-Research Natural Areas	None		Prohibit motorized vehicles within Research Natural Areas. Manage recreation according to the designated Recreation Opportunity Spectrum classes (see Forest Standards and Guidelines).
	Special Areas - Other Special Areas	None	Restricted Off-Highway Vehicle Use	
T (page 4-71)	Timber	None	Restricted Off-Highway Vehicle Use	None
V (page 4-73)	View/ Timber	None	Restricted Off-Highway Vehicle Use	Manage recreation according to the Recreation Opportunity Spectrum (ROS) class of Roaded Natural or Rural (see Forest Standards and Guidelines).
W (page 4-76)	Wilderness	None		Prohibit motorized vehicles except where authorized for emergencies or for other purposes, based on environmental analysis.
Z (page 4-79)	Minimal Management	None		None

Sierra Nevada Forest Plan Amendment

Forest-wide Standards and Guidelines

Standards and guidelines described in this section apply to all land allocations (other than wilderness areas and wild and scenic river areas) unless stated otherwise (2004 Record of Decision, page 49).

Wheeled Vehicles

Prohibit wheeled vehicle travel off of designated routes, trails, and limited off-highway vehicle (OHV) use areas. Unless otherwise restricted by current forest plans or other specific area standards and guidelines, cross-country travel by over-snow vehicles would continue (2004 Record of Decision, page 59).

36 CFR §212.55: Criteria for designation of roads, trails, and areas.

(a) General criteria for designation of National Forest System roads, National Forest System trails, and areas on National Forest System lands. In designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use, the responsible official shall consider effects on National Forest System natural and cultural resources, public safety, provision of recreational opportunities, access needs, conflicts among uses of National Forest System lands, the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration.

(b) Specific criteria for designation of trails and areas. In addition to the criteria in paragraph (a) of this section, in designating National Forest System trails and areas on National Forest System lands, the responsible official shall consider effects on the following, with the objective of minimizing:

> (1) Damage to soil, watershed, vegetation, and other forest resources; (2) Harassment of wildlife and significant disruption of wildlife habitats; (3) Conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands; and (4) Conflicts among different classes of motor vehicle uses of National Forest System lands or neighboring Federal lands.

In addition, the responsible official shall consider:

> (5) Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.

(c) Specific criteria for designation of roads. In addition to the criteria in paragraph (a) of this section, in designating National Forest System roads, the responsible official shall consider: (1) Speed, volume, composition, and distribution of traffic on roads; and (2) Compatibility of vehicle class with road geometry and road surfacing.

(d) Rights of access. In making designations pursuant to this subpart, the responsible official shall recognize: (1) Valid existing rights; and (2) The rights of use of National Forest System roads and National Forest System trails under § 212.6(b).

(e) Wilderness areas and primitive areas. National Forest System roads, National Forest System trails, and areas on National Forest System lands in wilderness areas or primitive areas shall not be designated for motor vehicle use pursuant to this section, unless, in the case of wilderness areas, motor vehicle use is authorized by the applicable enabling legislation for those areas.

Appendix C. Mitigations to Address the Minimization Criteria in the Travel Regulations for Areas Designated for OSV Use

The mitigations listed would not apply to the no-action alternative because no project activities are proposed; no changes would be made to the existing system of OSV trails or areas in the planning area under the no-action alternative. However, continuing current management under the no-action alternative would include the use of standard operating procedures and best management practices for routine maintenance of the current OSV areas.

Ashpan OSV Area

General and Specific Criteria for OSV Designated Areas (36 CFR 212.55(b))

Table 182. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources in the Ashpan OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the area be located in a watershed that is of concern?	No	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. To prevent substantial impacts to soil resources, areas designated for public, cross-country OSV use would be clearly delineated and marked in the field, where practical. Areas would be protected from substantial impacts to resources resulting from overuse by closing or managing designated OSV areas to mitigate adverse effects to soil, water quality, and riparian resources, by changing season-of-use periods as necessary to allow rehabilitation of an area, particularly hill-climb areas. OSV use would be prohibited on open water.
	Would the area contain sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to sensitive riparian areas. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area drain into a 303(d)-listed waterbody?	No	N/A
Minimize impacts on vegetation.	Would TES plant be known to occur in this area, particularly those that are near, at, or above the surface of the snow?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested that TES plants are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with native soil and live vegetation as follows: <u>Alternative 2</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. <u>Alternative 3</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to TES plants. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting TES plants would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area include designated botanical areas (SIA, RNA)?	No	N/A
Minimize impacts on other forest resources.	Would the area contain cultural, tribal, or historic sites?	Yes	In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Table 183. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats in the Ashpan OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the area encompass great gray owl, Northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – Northern goshawk, California spotted owl	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring Northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of Northern goshawk is occurring, we would mitigate according to Forest Plan direction.
	Would the area encompass known bald eagle nest sites?	No	N/A
	Would the area contain key deer winter range?	No	N/A
Minimize disruption of wildlife habitats.	Would SNYLF habitat be located in the area?	No	N/A

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)	Would the area contain habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes – fisher, marten, SN red fox, wolverine	Presently, there are no known sensitive forest carnivore den sites identified within the Ashpan OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction. There have been no Sierra Nevada red fox (SNRF) detections in the Ashpan OSV area. Existing monitoring data indicates the interaction between SNRF and cross-country OSV use would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of a Sierra Nevada red fox or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed (by order) to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 184. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands in the Ashpan OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use in this area cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	No	The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts.
	Would the area encompass areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	Yes – Thousand Lakes Wilderness	None of the alternatives would designate Wilderness for OSV use. OSV incursions have not been noted for Thousand Lakes Wilderness. Forest staff would continue to monitor for OSV incursions in all action alternatives. If incursions are discovered, the agency would increase enforcement patrols in this area, increase signing at trailhead information kiosks, and ensure Wilderness boundary signage is sufficient to identify the Wilderness boundary.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the area abut a wilderness area or National Park managed by other agencies?	Yes – Thousand Lakes Wilderness	None of the alternatives would authorize OSV use in Wilderness. OSV incursions have not been noted for Thousand Lakes Wilderness. Forest staff would continue to monitor for OSV incursions in all action alternatives. If incursions are discovered, the agency would increase enforcement patrols in this area, increase signing at trailhead information kiosks, and ensure Wilderness boundary signage is sufficient to identify the Wilderness boundary.
	Would the designated area or trail abut a developed recreation site?	No	N/A

Table 185. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands in the Ashpan OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed in this area? If so, does this affect safety and winter management of this area?	Yes	Wheeled vehicle cross-country travel is prohibited under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind the existing wheeled vehicle prohibitions.
	Would OSV use of this area conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring federal lands.		No	N/A

Table 186. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors in the Ashpan OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the area be located adjacent to neighborhoods and communities?	The area is adjacent to Old Station; there are no recorded complaints or instances of use conflict with residents of Old Station.	N/A
	Would OSV use of this area compatible with distinct characteristics of the community?	Yes	N/A
	Would the OSV area be located adjacent Federal or State lands designated for OSV use?	Yes. Latour State Forest has trails identified for grooming that link with the NFS designated trails identified for grooming.	N/A
	Would the sounds and emissions from OSV use of this area be compatible with nearby populated areas?	Yes	N/A

Bogard OSV Area

General and Specific Criteria for OSV Designated Areas (36 CFR 212.55(b))

Table 187. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources in the Bogard OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the area be located in a watershed that is of concern?	Adjacent to Eagle Lake in some areas.	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. OSV use would be prohibited on open water. The Osprey Management Area is currently closed to cross-country OSV use and the Osprey Management Area would not be designated for cross-country OSV use under any alternative. The South Eagle Lake recreation area would not be designated for cross-country OSV use under any action alternative.
	Would the area contain sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to sensitive riparian areas. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area drain into a 303(d)-listed waterbody?	Yes	None necessary. OSV use would not result in further impairment because the pollutant of concern is not related to OSV operation.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation.	Would TES plant be known to occur in this area, particularly those that are near, at, or above the surface of the snow?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested that TES plants are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with native soil and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)			Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse impacts to TES plants. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting TES plants would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area include designated botanical areas (SIA, RNA)?	No	N/A
Minimize impacts on other forest resources.	Would the area contain cultural, tribal, or historic sites?	Yes	In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Table 188. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats in the Bogard OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the area encompass great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – Northern goshawk, California spotted owl	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to Forest Plan direction.
Minimize harassment of wildlife. (continued)	Would the area encompass known bald eagle nest sites?	Yes. In the Osprey Management Area and the South Eagle Lake recreation area.	The Osprey Management Area is currently closed by order to cross-country OSV use and the Osprey Management Area would not be designated for cross-country OSV use under any alternative. The South Eagle Lake recreation area would not be designated for cross-country OSV use under any action alternative. In all alternatives, other known or newly discovered active nest sites would be managed according to forest plan direction.
	Would the area contain key deer winter range?	Yes	Action alternatives 2 through 4 would monitor deer winter range for adverse effects of cross-country OSV use on the condition of deer wintering in the area. If monitoring determines adverse effects to deer resulting from cross-country OSV use in winter range, it would be closed by order to cross-country OSV use in the same winter range as not designated in alternative 3. Alternative 5 would not designate deer winter range for cross-country OSV use.
Minimize disruption of wildlife habitats.	Would SNYLF habitat be located in the area?	No	N/A
	Would the area contain habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes – Wolverine (over 10k acres). The area contains less than 200 acres of suitable habitat conducive to OSV for marten, Sierra Nevada red fox, and fisher.	Presently, there are no known sensitive forest carnivore den sites identified within the Bogard OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction. There have been no Sierra Nevada red fox (SNRF) detections in the Bogard OSV area. Existing monitoring data indicate the interaction between SNRF and cross-country OSV use would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of a Sierra Nevada red fox or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)			Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed (by order) to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 189. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands in the Bogard OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use in this area cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	Yes. Potential conflicts with non-motorized use of the ski trail in the area at south end of Eagle Lake.	The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. None of the action alternatives would designate the South Eagle Lake recreation area for cross-country OSV use.
	Would the area encompass areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	Yes. Pacific Crest National Scenic Trail crosses through the extreme northwestern end of the area. There is also a ski trail in the area at south end of Eagle Lake.	OSV use on the Pacific Crest National Scenic Trail is prohibited, but crossing the trail would be allowed on designated snow trails. There are few designated OSV trails in the area of the Pacific Crest National Scenic Trail, so cross-country OSV use in this area would be minimal. Signage would be installed along the Pacific Crest National Scenic Trail, to enhance wayfinding for OSV use and reduce encroachment on the Pacific Crest National Scenic Trail. Agency signage procedures would be followed. As a guideline, trail markers would be at eye level, approximately 40 inches above the average snow depth. Alternatives 2, 3, 4, and 5 would only allow OSVs to cross the Pacific Crest National Scenic Trail on designated trails.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands. (continued)			Alternatives 2 and 5 would not designate an area 500 feet to either side of the Pacific Crest National Scenic Trail for OSV use. OSV use would only be allowed in this undesignated area on designated OSV trails provided to allow OSVs to cross the Pacific Crest National Scenic Trail. Action alternatives 3 and 4 would monitor for conflicts between OSV use and existing or proposed recreational uses within 500 feet of the Pacific Crest National Scenic Trail. If monitoring determines conflicts are occurring, it would be closed by order in the same undesignated area as in alternative 2. The South Eagle Lake recreation area would not be designated for cross-country OSV use in any action alternative.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the area abut a wilderness area or national park managed by other agencies?	No	N/A
	Would the designated area or trail abut a developed recreation site?	Yes	The Osprey Management Area is currently closed by order to cross-country OSV use and the Osprey Management Area would not be designated for cross-country OSV use under any alternative. The South Eagle Lake recreation area would not be designated for cross-country OSV use under any action alternative.

Table 190. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands in the Bogard OSV area

Criteria	Potential Impact Indicator	Would OSV use of the area have the potential to cause adverse impacts without mitigation?	If this area is designated, what measures would be taken to manage OSV use to minimize these impacts?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed in this area? If so, does this affect safety and winter management of this area?	Yes	Wheeled vehicle cross-country travel is prohibited under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind the existing wheeled vehicle prohibition.
	Would OSV use of this area conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring Federal lands.		No	N/A

Table 191. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors in the Bogard OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the area be located adjacent to neighborhoods and communities?	No	N/A
	Would OSV use of this area compatible with distinct characteristics of the community?	Yes	N/A
	Would the OSV area be located adjacent Federal or State lands designated for OSV use?	N/A	N/A
	Would the sounds and emissions from OSV use of this area be compatible with nearby populated areas?	No	N/A

Fall River OSV Area

General and Specific Criteria for OSV Designated Areas (36 CFR 212.55(b))

Table 192. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources in the Fall River OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the area be located in a watershed that is of concern?	No	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. To prevent substantial impacts to soil resources, areas designated for public, cross-country OSV use would be clearly delineated and marked in the field, where practical. Areas would be protected from substantial impacts to resources resulting from overuse by closing or managing designated OSV areas to mitigate adverse effects to soil, water quality, and riparian resources, by changing season-of-use periods as necessary to allow rehabilitation of an area, particularly hill-climb areas. OSV use would be prohibited on open water.
	Would the area contain sensitive riparian areas, for example wet meadows, bogs, fens, etc.?		This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with pen water, native soil, and live vegetation as follows: <u>Alternative 2</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 3: • No OSV trails would be designated in the Fall River OSV area under this alternative. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur. Alternative 4: • No OSV trails would be designated in the Fall River OSV area under this alternative. • Cross-country OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting resources. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • No snow trail grooming would occur. Alternative 5: • No OSV trails or areas would be designated in the Fall River area under Alternative 5. In all alternatives in which areas for cross-country OSV use would be designated, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to sensitive riparian areas. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area drain into a 303(d)-listed waterbody?	No	None necessary. OSV use would not result in further impairment because the pollutant of concern is not related to OSV operation.
Minimize impacts on vegetation.	Would TES plant be known to occur in this area, particularly those that are near, at, or above the surface of the snow?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested that TES plants are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with native soil and live vegetation as follows:

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)			Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur. Alternative 3: • No OSV trails would be designated in the Fall River OSV area under this alternative. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur. Alternative 4: • No OSV trails would be designated in the Fall River OSV area under this alternative. • Cross-country OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting resources. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • No snow trail grooming would occur. Alternative 5: • No OSV trails or areas would be designated in the Fall River area under Alternative 5. In all alternatives in which areas for cross-country OSV use would be designated, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse impacts to TES plants. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting TES plants would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area include designated botanical areas (SIA, RNA)?	No	N/A

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize Impacts on other forest resources.	Would the area contain cultural, tribal, or historic sites?		In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur. Alternative 3: • No OSV trails would be designated in the Fall River OSV area under this alternative. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur. Alternative 4: • No OSV trails would be designated in the Fall River OSV area under this alternative. • Cross-country OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting resources. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • No snow trail grooming would occur. Alternative 5: • No OSV trails or areas would be designated in the Fall River area under alternative 5. In all alternatives in which areas for cross-country OSV use would be designated, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize Impacts on other forest resources. (continued)			To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Table 193. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats in the Fall River OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the area encompass great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes. Northern spotted owl Protected Activity Center and Designated Critical Habitat; northern goshawk PACs	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to forest plan direction.
	Would the area encompass known bald eagle nest sites?	Yes - 11 sites	In all alternatives, other known or newly discovered active nest sites would be managed according to forest plan direction.
	Would the area contain key deer winter range?	Yes	Action alternatives 2 through 4 would monitor deer winter range for adverse effects of cross-country OSV use on the condition of deer wintering in the area. If monitoring determines adverse effects to deer resulting from cross-country OSV use in winter range, the winter range would be closed by order. Alternative 5 would not designate the Fall River area for cross-country OSV use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats.	Would Sierra Nevada yellow-legged frog (SNYLF) habitat be located in the area?	No	N/A
	Would the area contain habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes – wolverine, fisher	Presently, there are no known sensitive forest carnivore den sites identified within the Fall River OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction. There have been no Sierra Nevada red fox (SNRF) detections in the Fall River OSV area. Existing monitoring data indicates the interaction between SNRF and cross-country OSV use would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of a Sierra Nevada red fox or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed (by order) to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 194. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands in the Fall River OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use in this area cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	Yes. Pacific Crest National Scenic Trail occurs through the NW portion of the area.	OSV use on the Pacific Crest National Scenic Trail is prohibited, but crossing the trail would be allowed on designated snow trails. There are few designated OSV trails in the area of the Pacific Crest National Scenic Trail, so cross-country OSV use in this area would be minimal. All action alternatives would prohibit OSV use on the Pacific Crest National Scenic Trail. Alternatives 2, 3, 4, and 5 would only allow OSVs to cross the Pacific Crest National Scenic Trail on designated trails. There are few designated OSV trails in the area of the Pacific Crest National Scenic Trail, so cross-country OSV use in this area would be minimal. Alternatives 2 and 5 would not designate an area 500 feet to either side of the Pacific Crest National Scenic Trail for OSV use. OSV use would only be allowed in this undesignated area on designated OSV trails provided to allow OSVs to cross the Pacific Crest National Scenic Trail. Action alternatives 3 and 4 would monitor for conflicts between OSV use and existing or proposed recreational uses within 500 feet of the Pacific Crest National Scenic Trail. If monitoring determines conflicts are occurring, the same undesignated area along the Pacific Crest National Scenic Trail as in alternatives 2 and 5 would be closed by order to cross-country OSV use. The Fall River OSV area would not be designated for cross-country OSV use, and therefore, would not exist, under alternative 5.
	Would the area encompass areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	Yes. Pacific Crest National Scenic Trail occurs through the NW portion of the area. Area also surrounds the McArthur Burnie Falls State Park.	Signage would be installed along the Pacific Crest National Scenic Trail, to enhance wayfinding for OSV use and reduce encroachment on the Pacific Crest National Scenic Trail. Agency signage procedures would be followed. As a guideline, trail markers would be at eye level, approximately 40 inches above the average snow depth. OSV use on the Pacific Crest National Scenic Trail is prohibited, but crossing the trail would be allowed on designated snow trails. Alternatives 2, 3, 4, and 5 would only allow OSVs to cross the Pacific Crest National Scenic Trail on designated trails. There are few designated OSV trails in the area of the Pacific Crest National Scenic Trail, so cross-country OSV use in this area would be minimal. Alternatives 2 and 5 would not designate an area 500 feet to either side of the Pacific Crest National Scenic Trail for OSV use. OSV use would only be allowed in this undesignated area on designated OSV trails provided to allow OSVs to cross the Pacific Crest National Scenic Trail.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands. (continued)			Action alternatives 3 and 4 would monitor for conflicts between OSV use and existing or proposed recreational uses within 500 feet of the Pacific Crest National Scenic Trail. If monitoring determines conflicts are occurring, the same undesignated area as in alternatives 2 and 5 would be closed by order to cross-country OSV use. The Fall River OSV area would not be designated for cross-country OSV use, and therefore, would not exist, under alternative 5.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the area abut a wilderness area or national park managed by other agencies?	Yes. Area surrounds the McArthur Burnie Falls State Park.	In alternatives 2 through 4, we would monitor for use conflicts with the use of the State Park. If conflicts were found, the landlocked NFS parcel within the park (approximately 40 acres) and the landlocked contiguous NFS parcel south of the park in sections 3 and 4 (approximately 280 acres) would be closed by order to cross-country OSV use. The Fall River OSV area would not be designated for cross-country OSV use, and therefore, would not exist, under alternative 5.
	Does the designated area or trail abut a developed recreation site?	Yes. Area surrounds the McArthur Burnie Falls State Park.	In alternatives 2 through 4, we would monitor for use conflicts with the use of the State Park. If conflicts were found, the landlocked NFS parcel within the park (approximately 40 acres) and the landlocked contiguous NFS parcel south of the park is sections 3 and 4 (approximately 280 acres) would be closed by order to cross-country OSV use. The Fall River OSV area would not be designated for cross-country OSV use, and therefore, would not exist, under alternative 5.

Table 195. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands in the Fall River OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed in this area? If so, does this affect safety and winter management of this area?	No	N/A
	Would OSV use of this area conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring Federal lands.		No	N/A

Table 196. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors in the Fall River OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the area be located adjacent to neighborhoods and communities?	There are areas adjacent to Lake Britton that are used by a variety of recreationists; Yes. McArthur Burnie Falls State Park is also surrounded by NFS lands.	These areas receive very little cross-country OSV use. In alternatives 2 through 4, we would monitor for use conflicts with the use of the State Park. If conflicts were found, the landlocked NFS parcel within the park (approximately 40 acres) and the landlocked contiguous NFS parcel south of the park is sections 3 and 4 (approximately 280 acres) would be closed by order to cross-country OSV use. The Fall River OSV area would not be designated for cross-country OSV use, and therefore, would not exist, under alternative 5.
	Would OSV use of this area compatible with distinct characteristics of the community?	No, except for areas further removed from the lake and McArthur Burnie Falls State Park.	In alternatives 2 through 4, we would monitor for use conflicts with the use of the State Park. If conflicts were found, the landlocked NFS parcel within the park (approximately 40 acres) and the landlocked contiguous NFS parcel south of the park is sections 3 and 4 (approximately 280 acres) would be closed by order to cross-country OSV use. The Fall River OSV area would not be designated for cross-country OSV use, and therefore, would not exist, under alternative 5.
	Would the OSV area be located adjacent Federal or State lands designated for OSV use?	No	In alternatives 2 through 4, we would monitor for use conflicts with the use of the State Park. If conflicts were found, the landlocked NFS parcel within the park (approximately 40 acres) and the landlocked contiguous NFS parcel south of the park is sections 3 and 4 (approximately 280 acres) would be closed by order to cross-country OSV use. The Fall River OSV area would not be designated for cross-country OSV use, and therefore, would not exist, under alternative 5.
	Would the sounds and emissions from OSV use of this area be compatible with nearby populated areas?	Yes. Sound and emissions could impact the McArthur Burnie Falls State Park.	In alternatives 2 through 4, we would monitor for use conflicts with the use of the State Park. If conflicts were found, the landlocked NFS parcel within the park (approximately 40 acres) and the landlocked contiguous NFS parcel south of the park is sections 3 and 4 (approximately 280 acres) would be closed by order to cross-country OSV use. The Fall River OSV area would not be designated for cross-country OSV use, and therefore, would not exist, under alternative 5.

Fredonyer OSV Area

General and Specific Criteria for OSV Designated Areas (36 CFR 212.55(b))

Table 197. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources in the Fredonyer OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the area be located in a watershed that is of concern?	No	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. To prevent substantial impacts to soil resources, areas designated for public, cross-country OSV use would be clearly delineated and marked in the field, where practical. Areas would be protected from substantial impacts to resources resulting from overuse by closing or managing designated OSV areas to mitigate adverse effects to soil, water quality, and riparian resources, by changing season-of-use periods as necessary to allow rehabilitation of an area, particularly hill-climb areas. OSV use would be prohibited on open water.
	Would the area contain sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to sensitive riparian areas. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area drain into a 303(d)-listed waterbody?	No	N/A

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation.	Would TES plant be known to occur in this area, particularly those that are near, at, or above the surface of the snow?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested that TES plants are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with native soil and live vegetation as follows: <u>Alternative 2</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. <u>Alternative 3</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. <u>Alternative 4</u>: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)			Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to TES plants. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting TES plants would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area include designated botanical areas (SIA, RNA)?	No	N/A
Minimize impacts on other forest resources.	Would the area contain cultural, tribal, or historic sites?	Yes	In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material;

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			• The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Table 198. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats in the Fredonyer OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the area encompass great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – Northern goshawk, California spotted owl	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to forest plan direction.
	Would the area encompass known bald eagle nest sites?	No	N/A
	Would the area contain key deer winter range?	Yes	Action alternatives 2 through 4 would monitor deer winter range for adverse effects of cross-country OSV use on the condition of deer wintering in the area. If monitoring determines adverse effects to deer resulting from cross-country OSV use in winter range, the same winter range as not designated in alternative 5 would be closed by order to cross-country OSV use. Alternative 5 would not designate deer winter range for cross-country OSV use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats.	Would SNYLF habitat be located in the area?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested the Sierra Nevada Yellow-legged Frog habitat is being disrupted in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)			Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use without adversely affecting SNYLF. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting SNYLF would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area contain habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes – Marten, wolverine, fisher. The area contains some past Sierra Nevada red fox (SNRF) detections, and a small amount of suitable habitat, but no suitable habitats were modeled as areas of moderate to high OSV use.	Presently, there are no known sensitive forest carnivore den sites identified within the Fredonyer OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction. There have been no SNRF detections in the Fredonyer OSV area. Existing monitoring data indicate the interaction between SNRF and cross-country OSV use would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of a SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 199. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands in the Fredonyer OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use in this area cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing)?	Yes – potential conflicts in Diamond Mountain area with non-motorized uses.	The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. Alternatives 2 through 4 would monitor for conflicts in these areas. Alternative 5 would not designate the areas immediately west and east of Diamond Mountain for cross-country OSV use. If monitoring under alternatives 2 through 4 determines conflicts are occurring, the same areas as not designated in alternative 5 immediately west and east of Diamond Mountain would be closed by order to cross-country OSV use.
	Would the area encompass areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	Yes – Diamond Mountain area has been identified by the non-motorized community as a significant area for skiing.	OSV use on the Pacific Crest National Scenic Trail is prohibited, but crossing the trail would be allowed on designated snow trails. There are few designated OSV trails in the area of the Pacific Crest National Scenic Trail, so cross-country OSV use in this area would be minimal. Alternatives 2 through 5 would monitor for conflicts in these areas. Alternative 5 would not designate the areas immediately west and east of Diamond Mountain for cross-country OSV use. If monitoring under alternatives 2 through 4 determines conflicts are occurring, the same areas immediately west and east of Diamond Mountain as not designated in alternative 5 would be closed by order to cross-country OSV use.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the area abut a wilderness area or National Park managed by other agencies?	No	N/A
	Would the designated area or trail abut a developed recreation site?	No	N/A

Table 200. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands in the Fredonyer OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed in this area? If so, does this affect safety and winter management of this area?	Yes	Wheeled vehicle cross-country travel is prohibited under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind the existing wheeled vehicle prohibition.
	Would OSV use of this area conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring federal lands.		No	N/A

Table 201. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors in the Fredonyer OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the area be located adjacent to neighborhoods and communities?	No	N/A
	Would OSV use of this area compatible with distinct characteristics of the community?	Yes	N/A
	Would the OSV area be located adjacent Federal or State lands designated for OSV use?	N/A	N/A
	Would the sounds and emissions from OSV use of this area be compatible with nearby populated areas?	N/A	N/A

Jonesville OSV Area

General and Specific Criteria for OSV Designated Areas (36 CFR 212.55(b))

Table 202. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources in the Jonesville OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the area be located in a watershed that is of concern?	Yes. Deer Creek has anadromous fish species.	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. To prevent substantial impacts to soil resources, areas designated for public, cross-country OSV use would be clearly delineated and marked in the field, where practical. Areas would be protected from substantial impacts to resources resulting from overuse by closing or managing designated OSV areas to mitigate adverse effects to soil, water quality, and riparian resources, by changing season-of-use periods as necessary to allow rehabilitation of an area, particularly hill-climb areas. OSV use would be prohibited on open water. Current management includes a non-motorized area to act as a buffer on the west side of Deer Creek. All action alternatives would maintain this buffer as an area not designated for OSV use on the west side of the creek. Alternatives 2 through 4 would monitor for impacts to soil and water quality along the east side of Deer Creek. If monitoring determines that adverse effects are occurring, the east side of Deer Creek would be buffered as it is in alternative 5. Alternative 5 would extend a non-motorized area on the east side of Deer Creek.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)	Would the area contain sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area drain into a 303(d)-listed waterbody?	No	None necessary. OSV use would not result in further impairment because the pollutant of concern is not related to OSV operation.
Minimize impacts on vegetation.	Would TES plant be known to occur in this area, particularly those that are near, at, or above the surface of the snow?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested that TES plants are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with native soil and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation.			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting TES plants would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area include designated botanical areas (SIA, RNA)?	Yes	None of the action alternatives would designate sensitive areas for cross-country OSV use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources.	Would the area contain cultural, tribal, or historic sites?	Yes	In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Table 203. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats in the Jonesville OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the area encompass great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes. Northern goshawk and California spotted owl.	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to forest plan direction.
	Would the area encompass known bald eagle nest sites?	Yes. Along Lake Almanor's shore.	None of the action alternatives would designate a broad area along Almanor lakeshore or the non-motorized ski trails in this area for cross-country OSV use.
	Would the area contain key deer winter range?	No	N/A
Minimize disruption of wildlife habitats.	Would SNYLF habitat be located in the area?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested the SNYLF habitat is being disrupted in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use without adversely affecting SNYLF. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting SNYLF would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area contain habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes – marten, wolverine, SNRF, and fisher.	Presently, there are no known sensitive forest carnivore den sites identified within the Jonesville OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)			There have been no SNRF detections in the Jonesville OSV area. Existing monitoring data indicates the interaction between SNRF and cross-country OSV use would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 204. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands in the Jonesville OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use in this area cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	Yes – potential use conflicts with skiers along Almanor lakeshore and within vicinity of Colby Mountain ski trail.	The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. None of the action alternatives would designate a broad area along Almanor lakeshore or the non-motorized ski trails in this area for cross-country OSV use. In alternatives 3 through 5, the area near Colby Mountain would not be designated for cross-country OSV use. Alternative 2 would monitor for potential conflicts between OSV use and existing or proposed recreational uses of NFS lands near Colby Mountain. If monitoring determines conflicts are occurring, the same area that would not be designated for cross-country OSV use in alternatives 3 through 5 would be closed by order to cross-country OSV use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands. (continued)	Would the area encompass areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	Yes – potential use conflicts with skiers along Almanor lakeshore and within vicinity of Colby Mountain ski trail. Pacific Crest National Scenic Trail roughly bisects the area north to south.	Signage would be installed along the Pacific Crest National Scenic Trail, to enhance wayfinding for OSV use and reduce encroachment on the Pacific Crest National Scenic Trail. Agency signage procedures would be followed. As a guideline, trail markers would be at eye level, approximately 40 inches above the average snow depth. OSV use on the Pacific Crest National Scenic Trail is prohibited, but crossing the trail would be allowed on designated snow trails. There are few designated OSV trails in the area of the Pacific Crest National Scenic Trail, so cross-country OSV use in this area would be minimal. None of the action alternatives designate Wilderness and Semi-Primitive non-motorized areas for any kind of OSV use. In all action alternatives, non-motorized ski trails and a broad area along Almanor lakeshore would also not be designated for cross-country OSV use. In alternatives 3 through 5, the area near Colby Mountain would not be designated for cross-country OSV use. Alternative 2 would monitor for potential conflicts between OSV use and existing or proposed recreational uses of NFS lands near Colby Mountain. If monitoring determines conflicts are occurring, the same area that would not be designated for cross-country OSV use in alternatives 3 through 5 would be closed by order to cross-country OSV use.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the area abut a wilderness area or National Park managed by other agencies?	No	N/A
	Would the designated area or trail abut a developed recreation site?	Yes. Almanor ski trail, campgrounds and boat ramps	None of the action alternatives would designate a broad area along Almanor lakeshore or the non-motorized ski trails in this area for cross-country OSV use.

Table 205. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands in the Jonesville OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed in this area? If so, does this affect safety and winter management of this area?	Yes.	Wheeled vehicle cross-country travel is prohibited under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind the existing wheeled vehicle prohibition.
	Would OSV use of this area conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring federal lands.		No	N/A

Table 206. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors in the Jonesville OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the area be located adjacent to neighborhoods and communities?	Yes. Prattville on Almanor lakeshore.	None of the action alternatives would designate a broad area along Almanor lakeshore or the non-motorized ski trails in this area for cross-country OSV use.
	Would OSV use of this area compatible with distinct characteristics of the community?	Yes. Prattville on Almanor lakeshore.	None of the action alternatives would designate a broad area along Almanor lakeshore or the non-motorized ski trails in this area for cross-country OSV use.
	Would the OSV area be located adjacent Federal or State lands designated for OSV use?	Yes. The Plumas National Forest	N/A
	Would the sounds and emissions from OSV use of this area be compatible with nearby populated areas?	No. Prattville on Almanor lakeshore.	None of the action alternatives would designate a broad area along Almanor lakeshore or the non-motorized ski trails in this area for cross-country OSV use.

Morgan Summit OSV Area

General and Specific Criteria for OSV Designated Areas (36 CFR 212.55(b))

Table 207. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources in the Morgan Summit OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the area be located in a watershed that is of concern?	Yes – Deer and Mill Creeks for anadromous fish species.	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. To prevent substantial impacts to soil resources, areas designated for public, cross-country OSV use would be clearly delineated and marked in the field, where practical. Areas would be protected from substantial impacts to resources resulting from overuse by closing or managing designated OSV areas to mitigate adverse effects to soil, water quality, and riparian resources, by changing season-of-use periods as necessary to allow rehabilitation of an area, particularly hill-climb areas. OSV use would be prohibited on open water. In all action alternatives, areas adjacent to both creeks would not be designated for cross-country OSV use in order to provide streamside protection. The sizes of these undesignated areas would be expanded in alternatives 4 and 5.
	Would the area contain sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows:

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)	Would the area drain into a 303(d)-listed waterbody?	No	In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists. None necessary. OSV use would not result in further impairment because the pollutant of concern is not related to OSV operation.
Minimize impacts on vegetation.	Would TES plant be known to occur in this area, particularly those that are near, at, or above the surface of the snow?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested that TES plants are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with native soil and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting TES plants would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area include designated botanical areas (SIA, RNA)?	Yes	None of the action alternatives, would designate the sensitive botanical areas for cross-country OSV use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources.	Would the area contain cultural, tribal, or historic sites?	Yes	In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Table 208. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats in the Morgan Summit OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the area encompass great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes. Northern goshawk, California spotted owl.	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to Forest Plan direction.
	Would the area encompass known bald eagle nest sites?	Yes (Stump Ranch)	In all alternatives, other known or newly discovered active nest sites would be monitored and managed according to forest plan direction.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife. (continued)	Would the area contain key deer winter range?	Yes	Action alternatives 1 through 4 would monitor deer winter range for adverse effects of cross-country OSV use on the condition of deer wintering in the area. If monitoring determines adverse effects to deer resulting from cross-country OSV use in winter range, the winter range in the same area as not designated in Alternative 5 would be closed by order to cross-country OSV use. Alternative 5 would not designate deer winter range for cross-country OSV use.
	Would SNYLF habitat be located in the area?	No	N/A
	Would the area contain habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes – marten, wolverine, SNRF, fisher	Presently, there are no known sensitive forest carnivore den sites identified within the Morgan Summit OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction. There have been no SNRF detections in the Morgan Summit OSV area. Existing monitoring data indicates the interaction between SNRF and cross-country OSV use would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 209. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands in the Morgan Summit OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands.	Would OSV use in this area cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	Yes – potential use conflicts with cross-country skiers around McGowan Lake area.	The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. The non-motorized ski trail is currently closed to OSV use and this prohibition would continue under all alternatives. In alternatives 2, the cross-country ski trail around McGowan Lake would not be designated for OSV use while the broader area would be designated for cross-country OSV use. In alternatives 3 through 5, cross-country OSV use would not be designated in a broader area around ski trails but allow for through use of OSVs on designated trails.
	Would the area encompass areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	Yes – potential use conflicts with cross-country skiers around McGowan Lake area. Area abuts Ishi Wilderness. Pacific Crest National Scenic Trail runs north and south in the eastern end of the area.	OSV use on the Pacific Crest National Scenic Trail is prohibited, but crossing the trail would be allowed on designated snow trails. There are few designated OSV trails in the area of the Pacific Crest National Scenic Trail, so cross-country OSV use in this area would be minimal. Agency signage procedures would be followed. As a guideline, trail markers would be at eye level, approximately 40 inches above the average snow depth. The non-motorized ski trail is currently closed to OSV use and this trail would not be designated in any of the alternatives. Alternatives 3 through 5, Cross-country OSV use would not be designated in a broader area around ski trails but allow for through use of OSVs on designated trails. The Ishi Wilderness area lies at a relatively low elevation with historically infrequent snow fall. This area is currently closed to cross-country OSV use in most of the border area around the Ishi Wilderness and this area would not be designated for OSV under any alternatives. The Pacific Crest National Scenic Trail is located in an area that receives minimal use by OSVs.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the area abut a wilderness area or National Park managed by other agencies?	Yes – Lassen Volcanic National Park	In all action alternatives, a majority of the area bordering Lassen Volcanic National Park would not be designated for cross-country OSV use.
	Would the designated area or trail abut a developed recreation site?	No	N/A

Table 210. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands in the Morgan Summit OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Is wheeled vehicle use over snow allowed in this area? If so, does this affect safety and winter management of this area?	Yes	Wheeled vehicle cross-country travel is prohibited under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind the existing wheeled vehicle prohibition.
Minimize conflicts among different classes of motor vehicle uses of other neighboring Federal lands.		No	N/A

Table 211. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors in the Morgan Summit OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the area be located adjacent to neighborhoods and communities?	Yes – Mineral	Mineral is predominately an OSV destination. Furthermore, the local community relies on OSV use to attract business.
	Would OSV use of this area compatible with distinct characteristics of the community?	Yes - Mineral	Mineral is predominately an OSV destination. Furthermore, the local community relies on OSV use to attract business.
	Would the OSV area be located adjacent Federal or State lands designated for OSV use?	No	N/A
	Would the sounds and emissions from OSV use of this area be compatible with nearby populated areas?	Yes – Mineral	Mineral is predominately an OSV destination. Furthermore, the local community relies on OSV use to attract business.

Shasta OSV Area

General and Specific Criteria for OSV Designated Areas (36 CFR 212.55(b))

Table 212. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources in the Shasta OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the area be located in a watershed that is of concern?	No	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. To prevent substantial impacts to soil resources, areas designated for public, cross-country OSV use would be clearly delineated and marked in the field, where practical. Areas would be protected from substantial impacts to resources resulting from overuse by closing or managing designated OSV areas to mitigate adverse effects to soil, water quality, and riparian resources, by changing season-of-use periods as necessary to allow rehabilitation of an area, particularly hill-climb areas. OSV use would be prohibited on open water.
	Would the area contain sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	Yes	This area has been managed as open to OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows: <u>Alternative 2</u>: • No trails for OSV use would be designated in the Shasta OSV area. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur in the Shasta OSV area.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 3: • No trails for OSV use would be designated in the Shasta OSV area. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur in the Shasta OSV area. Alternative 4: • No OSV trails would be designated in the Shasta OSV area under this alternative. • Cross-country OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting resources. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • No snow trail grooming would occur. Alternative 5: • No OSV areas or trails would be designated in the Shasta OSV area under this alternative. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area drain into a 303(d)-listed waterbody?	No	N/A
Minimize impacts on vegetation.	Would TES plant be known to occur in this area, particularly those that are near, at, or above the surface of the snow?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested that TES plants are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with native soil and live vegetation as follows:

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)			Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches Alternative 4: • No OSV trails would be designated in the Shasta OSV area under this alternative. • Cross-country OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting resources. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • No snow trail grooming would occur. Alternative 5: • No OSV areas or trails would be designated in the Shasta OSV area under this alternative. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting TES plants would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area include designated botanical areas (SIA, RNA)?	No	N/A

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources.	Would the area contain cultural, tribal, or historic sites?	Yes	In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • No OSV trails would be designated in the Shasta OSV area under this alternative. • Cross-country OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting resources. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • No snow trail grooming would occur. Alternative 5: • No OSV areas or trails would be designated in the Shasta OSV area under this alternative. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions:

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			• Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Table 213. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats in the Shasta OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the area encompass great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – northern goshawk PACs	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to Forest Plan direction.
	Would the area encompass known bald eagle nest sites?	Yes – 1 site	In all alternatives, other known or newly discovered active nest sites would be monitored and managed according to forest plan direction.
	Would the area contain key deer winter range?	Yes	Action alternatives 2 through 4 would monitor deer winter range for adverse effects of cross-country OSV use on the condition of deer wintering in the area. If monitoring determines adverse effects to deer resulting from cross-country OSV use in winter range, the same winter range as not designated in alternative 3 would be closed by order to cross-country OSV use. The Shasta OSV area would not be designated for OSV use under alternative 5.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats.	Would SNYLF habitat be located in the area?	No	N/A
	Would the area contain habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes – wolverine, fisher	Presently, there are no known sensitive forest carnivore den sites identified within the Shasta OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction. Under all alternatives that designate this area for OSV use, detection of a wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 214. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands in the Shasta OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use in this area cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	No	The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts.
	Would the area encompass areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	No	N/A
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the area abut a wilderness area or National Park managed by other agencies?	Yes. No conflicts with neighboring federal land. This area shares a small segment of forest boundary with Ahjumawi State Park	None of the alternatives would authorize OSV use on land or trails that are not managed by the Forest Service. Cross-country OSV use is limited in this area and snow depths are historically very low. There have been no reports of concerns with OSVs entering adjacent state lands.
	Would the designated area or trail abut a developed recreation site?	No	N/A

Table 215. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands in the Shasta OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed in this area? If so, does this affect safety and winter management of this area?	No	Wheeled vehicle cross-country travel is prohibited under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind the existing wheeled vehicle prohibition.
	Would OSV use of this area conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring Federal lands.		No	N/A

Table 216. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors in the Shasta OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the area be located adjacent to neighborhoods and communities?	Yes. Area is adjacent to the community of Day.	None of the alternatives would authorize cross-country OSV use on land that is not managed by the Forest Service. Cross-country OSV use is limited and snow depths are historically very low. There have been no reports of concerns with OSV noise or OSVs entering adjacent lands.
	Would OSV use of this area compatible with distinct characteristics of the community?	Yes. Individuals in these communities use OSV and cross-country skiing to get around when snow levels are sufficient.	Cross-country OSV use is limited. There have been no reports of conflict or need to take specific management action.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in	Would the OSV area be located adjacent Federal or State lands designated for OSV use?	No	There have been no reports of concerns with OSVs entering adjacent state lands.
populated areas, taking into account sound, emissions, and other factors. (continued)	Would the sounds and emissions from OSV use of this area be compatible with nearby populated areas?	Yes	N/A

Swain Mountain OSV Area

General and Specific Criteria for OSV Designated Areas (36 CFR 212.55(b))

Table 217. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources in the Swain Mountain OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the area be located in a watershed that is of concern?	Not located in a watershed of concern. No	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. To prevent substantial impacts to soil resources, areas designated for public, cross-country OSV use would be clearly delineated and marked in the field, where practical. Areas would be protected from substantial impacts to resources resulting from overuse by closing or managing designated OSV areas to mitigate adverse effects to soil, water quality, and riparian resources, by changing season-of-use periods as necessary to allow rehabilitation of an area, particularly hill-climb areas. OSV use would be prohibited on open water.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)	Would the area contain sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area drain into a 303(d)-listed waterbody?	No	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation.	Would TES plant be known to occur in this area, particularly those that are near, at, or above the surface of the snow?	Yes	Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists.
Minimize impacts on vegetation.	Would TES plant be known to occur in this area, particularly those that are near, at, or above the surface of the snow?	Yes	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested that TES plants are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with native soil and live vegetation as follows:

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)			Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)			In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting TES plants would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the area include designated botanical areas (SIA, RNA)?	No	N/A
Minimize impacts on other forest resources.	Would the area contain cultural, tribal, or historic sites?	Yes	In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Table 218. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats in the Swain Mountain OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the area encompass great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes - Northern goshawk, California spotted owl	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to Forest Plan direction.
	Would the area encompass known bald eagle nest sites?	Yes (2 nest sites)	In all alternatives, other known or newly discovered active nest sites would be monitored and managed according to forest plan direction.
	Would the area contain key deer winter range?	No	N/A
Minimize disruption of wildlife habitats.	Would SNYLF habitat be located in the area?	No	N/A
	Would the area contain habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes – marten, wolverine, SNRF, and fisher.	Presently, there are no known sensitive forest carnivore den sites identified within the Swain Mountain OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction. There have been no SNRF detections in the Swain Mountain OSV area. Existing monitoring data indicates the interaction between SNRF and cross-country OSV use would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 219. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands in the Swain Mountain OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use in this area cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	Yes. There are potential conflicts with OSV use and non-motorized uses accessing Caribou Wilderness and Lassen Volcanic National Park. There are potential conflicts between non-motorized uses and OSV use of the ski trail along the Bizz Johnson trail; also in the area around Hog Flat and McCoy reservoirs.	The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. Alternatives 3 through 5 would not designate the area used to access Caribou Wilderness and Lassen Volcanic National Park for cross-country OSV use. Alternative 2 would monitor for potential conflicts between cross-country OSV use and non-motorized recreation to access Caribou Wilderness and Lassen Volcanic National Park. If monitoring determines conflicts are occurring, the same area not designated in alternatives 3 through 5 would be closed by order to cross-country OSV use except for trails identified for grooming. Alternatives 3 through 5 would not designate the area used to access Butte Lake from Hwy. 44 for cross-country OSV use. Alternative 2 would also monitor for potential conflicts between non-motorized recreation and cross-country OSV use accessing Butte Lake from Hwy. 44. If monitoring determines conflicts are occurring, the same area not designated in alternatives 3 through 5 would be closed by order to cross-country OSV use except for trails identified for grooming. Alternatives 3 through 5 would not designate the area around the Bizz Johnson Trail for cross-country OSV use. Alternative 2 would also monitor for potential conflicts between non-motorized recreation and cross-country OSV use along the Bizz Johnson Trail. If monitoring determines conflicts are occurring, the same area not designated in alternatives 3 through 5 would be closed by order to cross-country OSV use except for trails identified for grooming. Alternative 5 would not designate the McCoy and Hog Flat areas for cross-country OSV use. Alternatives 3 and 4 would not designate the Hog Flat area for cross-country OSV use, but would designate McCoy for cross-country OSV use. Alternative 2 would designate both McCoy and Hog Flat areas for cross-country OSV use. Alternatives 2 through 4 would monitor for potential conflicts between non-motorized recreation and cross-country OSV use in the McCoy and Hog Flat areas for the alternatives in which they are designated for OSV use. If monitoring determines conflicts are occurring in these designated areas, either of these areas would be closed by order to cross-country OSV use except for trails identified for grooming in the same area not designated in alternative 5.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands. (continued)	Would the area encompass areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	Yes. The area includes Caribou Wilderness and several Semi-Primitive non-motorized areas border Wilderness and Lassen Volcanic National Park. The Pacific Crest National Scenic Trail crosses through northern area between Lassen Volcanic National Park and Hwy. 89/44. Hog Flat and McCoy have been identified as good non-motorized opportunities; Bizz Johnson trail is used by non-motorized community.	OSV use on the Pacific Crest National Scenic Trail is prohibited, but crossing the trail would be allowed on designated snow trails. There are few designated OSV trails in the area of the Pacific Crest National Scenic Trail, so cross-country OSV use in this area would be minimal. Signage would be installed along the Pacific Crest National Scenic Trail, to enhance wayfinding for OSV use and reduce encroachment on the Pacific Crest National Scenic Trail. Agency signage procedures would be followed. As a guideline, trail markers would be at eye level, approximately 40 inches above the average snow depth. All Wilderness and Lassen Volcanic National Park are currently closed to OSV use and these prohibitions would not be changed in this decision. The Forest Service would provide sufficient signing and educational materials such as maps to identify areas not designated for OSV use. These areas would not be designated for OSV use in any alternative. Alternatives 3 through 5 would not designate the area used to access Butte Lake from Hwy. 44 for cross-country OSV use. Alternative 2 would also monitor for potential conflicts between non-motorized recreation and cross-country OSV use accessing Butte Lake from Hwy. 44. If monitoring determines conflicts are occurring, the same area not designated in alternatives 3 through 5 would be closed by order to cross-country OSV use except for trails identified for grooming Alternatives 3 through 5 would not designate the area around the Bizz Johnson Trail for cross-country OSV use. Alternative 2 would also monitor for potential conflicts between non-motorized recreation and cross-country OSV use along the Bizz Johnson Trail. If monitoring determines conflicts are occurring, the same area not designated in alternatives 3 through 5 would be closed by order to cross-country OSV use except for trails identified for grooming. Alternative 5 would not designate the McCoy and Hog Flat areas for cross-country OSV use. Alternatives 3 and 4 would not designate the Hog Flat area for cross-country OSV use, but would designate McCoy for cross-country OSV use. Alternative 2 would designate both McCoy and Hog Flat areas for cross-country OSV use. Alternatives 2 through 4 would monitor for potential conflicts between non-motorized recreation and cross-country OSV use in the McCoy and Hog Flat areas for the alternatives in which they are designated for OSV use. If monitoring determines conflicts are occurring in these designated areas, the same areas not designated in Alternative 5 would be closed by order to cross-country OSV use except for trails identified for grooming.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the area abut a wilderness area or National Park managed by other agencies?	Yes – Caribou Wilderness and Lassen Volcanic National Park	OSV use is prohibited in Wilderness and Lassen Volcanic National Park and these prohibitions would not be changed by this decision. All alternatives would provide sufficient signing and educational materials such as maps to identify OSV-prohibited areas. Alternatives 3 through 5 expand areas not designated for cross-country OSV use to help buffer Lassen Volcanic National Park and wilderness, particularly around the Butte Lake access area. Under alternative 2, if monitoring determines that conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands is occurring, the same areas not designated under alternatives 3 through 5 would be closed by order to cross-country OSV use.
	Would the designated area or trail abut a developed recreation site?	Yes. Bizz Johnson trail area.	Alternatives 3 through 5 would not designate the area around the Bizz Johnson Trail for cross-country OSV use. Alternative 2 would monitor for potential conflicts between non-motorized recreation and cross-country OSV use along the Bizz Johnson Trail. If monitoring determines conflicts are occurring, the same area not designated in alternatives 3 through 5 would be closed by order to cross-country OSV use except for trails identified for grooming.

Table 220. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands in the Swain Mountain OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed in this area? If so, does this affect safety and winter management of this area?	Yes	Wheeled vehicle cross-country travel is prohibited under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind the existing wheeled vehicle prohibition.
	Would OSV use of this area conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring Federal lands.		No	N/A

Table 221. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors in the Swain Mountain OSV area

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the area be located adjacent to neighborhoods and communities?	No	N/A
	Would OSV use of this area compatible with distinct characteristics of the community?	Yes	N/A
	Would the OSV area be located adjacent Federal or State lands designated for OSV use?	N/A	N/A
	Would the sounds and emissions from OSV use of this area be compatible with nearby populated areas?	No	N/A

Appendix D. Mitigations to Address the Minimization Criteria in the Travel Regulations for Trails Designated for OSV Use

The mitigations listed would not apply to the no-action alternative because no project activities are proposed; no changes would be made to the existing system of OSV trails or areas in the planning area under the no-action alternative. However, continuing current management under the no-action alternative would include the use of standard operating procedures and best management practices for routine OSV trail grooming and maintenance of the current OSV trail system.

Ashpan Area OSV Trails

General and Specific Criteria for OSV Designated Trails (36 CFR 212.55(b))

Table 222. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources on Ashpan area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the trail be located in a watershed that is of concern?	No	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. Grooming of snow trails for OSV use would occur only when the ground surface is covered with adequate snowpack to prevent soil damage or soil rutting. The operator shall consider recent, current, and forecasted weather and snow conditions to ensure these conditions are met. OSV use of trails identified for grooming would occur only when and where adequate snow cover ensures negligible potential for contact with bare soil and practically no disturbance of underlying trail and road surfaces. This would prevent substantial impacts to water quality in perennial, intermittent, or ephemeral streams, or in wetlands or other bodies of water. Watershed resources would be protected by making spill containment equipment available at the facilities where grooming equipment is re-fueled.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
			Watershed resources would be protected by designating equipment maintenance and refueling sites to ensure that they are located on gentle slopes, on uplands, and outside of riparian conservation areas and sensitive terrestrial wildlife habitats.
Minimize impacts on soil and water quality. (continued)			To protect watershed resources, all stream crossings and other in-stream structures facilitating OSV passage would be designed and maintained to provide for the passage of flow and sediment, to withstand expected flood flows, and to allow for free movement of resident aquatic life (California Snowmobile Trail Grooming, California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division). To protect watershed resources, public OSV use of trails and grooming snow trails for OSV use would not occur in wetlands unless protected by at least 12 inches of packed snow or 2 inches of frozen soil. If OSV trails must enter wetlands, bridges or raised prisms with diffuse drainage to sustain flow patterns would be used. OSV use would be prohibited on open water.
	Would the trail cross sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on designated trails would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with soil or watershed resources as follows: <u>Alternative 2</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. <u>Alternative 3</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Does the area where the trail would be located drain into a 303(d)-listed waterbody?	No	N/A
Minimize impacts on vegetation.	Would this trail cross known TES plant occurrences, particularly those that are near, at, or above the surface of the snow?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	N/A

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)	Would the trail cross designated botanical areas (SIA, RNA)?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	N/A
Minimize impacts on other forest resources.	Would the trail cross areas that contain cultural, tribal, or historic sites?	Yes. However, all trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on designated trails would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use. The California OHMVR Division's snowcat fleet is subject to emission regulation by the California Air Resources Board (CARB) as off-road equipment. The CARB sets an emission limit for the vehicle fleet as a whole rather than for individual pieces of equipment. Based on the total horsepower of the vehicle fleet, and the model and year of the individual equipment within the fleet, CARB determines how much horsepower per year must be repowered, retrofitted, or retired. The California OHMVR Division then determines what modifications to make to its fleet in order to satisfy CARB requirements.

Table 223. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats on Ashpan area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the trail cross great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – Northern goshawk, California spotted owl	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to forest plan direction.
	Would the trail cross known bald eagle nest sites?	No	N/A
	Would the trail cross key deer winter range?	No	N/A
Minimize disruption of wildlife habitats.	Would the trail cross SNYLF habitat?	No	N/A
	Would the trail cross habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes – Fisher, wolverine, SNRF	Presently, there are no known sensitive forest carnivore den sites identified within the Ashpan OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of OSV use on designated trails to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from OSV use on designated trails under any alternative, we would manage the affected area according to forest plan direction. There have been no SNRF detections in the Ashpan OSV area. Existing monitoring data indicates the interaction between SNRF and OSV use on trails would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the affected area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 224. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands on Ashpan area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use on this trail cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	No	For groomed snow trails: The objective of minimizing conflicts between public OSV use and other existing or proposed recreational use would be addressed by prohibiting wheeled vehicle use of groomed snow trails from December 26 through March 31. The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. OSV trail grooming would be timed to minimize impacts on non-motorized recreation experiences. The grooming season generally begins in mid-December and continues through March. Start and stop times vary per trail location and are dependent upon the presence and depth of snow. Snow trails are prioritized for grooming based on visitor use. Grooming has historically occurred several times per week. As part of this proposal, the grooming frequency on priority trails would occur several times per week and after major storms, typically between 4:00 p.m. and 6:00 a.m. Snow trails would be groomed for public OSV use to a minimum width of 10 feet and typically up to 14 feet wide. Snow trails would be groomed up to 30 feet wide in the more heavily used areas such as near trailheads. Groomed trail width is determined by variety of factors such as width of the underlying road bed, width of grooming tractor, heavy two-way traffic on the trail, and trail corners. Snow trails would not be groomed beyond the width of the underlying roadbed, where one exists. Where the terrain allows, main ingress and egress snow trails that connect to the trailhead would be groomed to 18 feet wide or greater to facilitate the added traffic. Snowcats are operated at speeds in the range of 3 to 7 miles per hour. The vehicle is operated with warning lights on at all times. The maximum hours of equipment operation is generally a 12-hour day during peak season. Snow trail grooming for public OSV use would be conducted in accordance with the 1997 Snowmobile Trail Grooming Standards set by the California Off-Highway Motor Vehicle Recreation (OHMVR) Division, as follows: • Groomer operators shall be trained and directed by a grooming coordinator. • Groomer operators shall identify hazards in advance of grooming, preferably in autumn before snow falls. • Grooming operations shall maintain a 10-foot vertical clearance from potential obstructions

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
	Would the trail cross areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	No	N/A
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the trail abut a wilderness area or National Park managed by other agencies?	No	N/A
	Would the trail abut a developed recreation site?	No	N/A

Table 225. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands on Ashpan area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed on this trail? If so, would this affect safety and winter management of this trail?	Yes	Wheeled vehicle use is currently prohibited on trails identified for grooming from December 26 through March 31 under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind those existing wheeled vehicle prohibitions. Wheeled vehicle use would continue to be allowed on designated ungroomed routes throughout the year. Few or no conflicts would be expected.
	Would OSV use of this trail conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of other neighboring Federal lands.		No	N/A

Table 226. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors on Ashpan area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the trail be located adjacent to neighborhoods and communities?	No	N/A
	Would OSV use of this trail be compatible with distinct characteristics of the community?	Yes	N/A
	Would the OSV trail be located adjacent Federal or State lands designated for OSV use?	Yes. Latour State Forest has trails identified for grooming that link with the NFS designated trails identified for grooming.	Use of the NFS OSV trail would be compatible with the use of OSV trails on the Latour State Forest.
	Would the sounds and emissions from OSV use of this trail be compatible with nearby populated areas?	Yes	N/A

Bogard Area OSV Trails

General and Specific Criteria for OSV Designated Trails (36 CFR 212.55(b))

Table 227. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources on Bogard area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the trail be located in a watershed that is of concern?	No	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. Grooming of snow trails for OSV use would occur only when the ground surface is covered with adequate snowpack to prevent soil damage or soil rutting. The operator shall consider recent, current, and forecasted weather and snow conditions to ensure these conditions are met. OSV use of trails identified for grooming would occur only when and where adequate snow cover ensures negligible potential for contact with bare soil and practically no disturbance of underlying trail and road surfaces. This would prevent substantial impacts to water quality in perennial, intermittent, or ephemeral streams, or in wetlands or other bodies of water. Watershed resources would be protected by making spill containment equipment available at the facilities where grooming equipment is re-fueled. Watershed resources would be protected by designating equipment maintenance and refueling sites to ensure that they are located on gentle slopes, on uplands, and outside of riparian conservation areas and sensitive terrestrial wildlife habitats. To protect watershed resources, all stream crossings and other in-stream structures facilitating OSV passage would be designed and maintained to provide for the passage of flow and sediment, to withstand expected flood flows, and to allow for free movement of resident aquatic life (California Snowmobile Trail Grooming, California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division). To protect watershed resources, public OSV use of trails and grooming snow trails for OSV use would not occur in wetlands unless protected by at least 12 inches of packed snow or 2 inches of frozen soil. If OSV trails must enter wetlands, bridges or raised prisms with diffuse drainage to sustain flow patterns would be used. OSV use would be prohibited on open water.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)	Would the trail cross sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on designated trails would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with soil and watershed resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)	Does the area where the trail would be located drain into a 303(d)-listed waterbody?	No	N/A
Minimize impacts on vegetation.	Would this trail cross known TES plant occurrences, particularly those that are near, at, or above the surface of the snow?	No. No. All trails designated for OSV use in this area would overlie National Forest System roads.	N/A
	Would the trail cross designated botanical areas (SIA, RNA)?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	N/A
Minimize impacts on other forest resources.	Would the trail cross areas that contain cultural, tribal, or historic sites?	Yes. However, all trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on trails designated for such use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. <u>Alternative 5</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			The California OHMVR Division's snowcat fleet is subject to emission regulation by the California Air Resources Board (CARB) as off-road equipment. The CARB sets an emission limit for the vehicle fleet as a whole rather than for individual pieces of equipment. Based on the total horsepower of the vehicle fleet, and the model and year of the individual equipment within the fleet, CARB determines how much horsepower per year must be repowered, retrofitted, or retired. The California OHMVR Division then determines what modifications to make to its fleet in order to satisfy CARB requirements.

Table 228. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats on Bogard area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the trail cross great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – California spotted owl, northern goshawk	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to Forest Plan direction.
	Would the trail cross known bald eagle nest sites?	No	N/A
	Would the trail cross key deer winter range?	No	N/A
Minimize disruption of wildlife habitats.	Would the trail cross SNYLF habitat?	No	N/A
	Would the trail cross habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes	Presently, there are no known sensitive forest carnivore den sites identified within the Bogard OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of OSV use on designated trails to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from OSV use on designated trails under any alternative, we would manage the affected area according to forest plan direction.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)			There have been no SNRF detections in the Bogard OSV area. Existing monitoring data indicates the interaction between SNRF and OSV use on trails would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the affected area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 229. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands on Bogard area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use on this trail cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	No	For groomed snow trails: The objective of minimizing conflicts between public OSV use and other existing or proposed recreational use would be addressed by prohibiting wheeled vehicle use of groomed snow trails from December 26 through March 31. The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. OSV trail grooming would be timed to minimize impacts on non-motorized recreation experiences. The grooming season generally begins in mid-December and continues through March. Start and stop times vary per trail location and are dependent upon the presence and depth of snow. Snow trails are prioritized for grooming based on visitor use. Grooming has historically occurred several times per week. As part of this proposal, the grooming frequency on priority trails would occur several times per week and after major storms, typically between 4:00 p.m. and 6:00 a.m.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands. (continued)			Snow trails would be groomed for public OSV use to a minimum width of 10 feet and typically up to 14 feet wide. Snow trails would be groomed up to 30 feet wide in the more heavily used areas such as near trailheads. Groomed trail width is determined by variety of factors such as width of the underlying road bed, width of grooming tractor, heavy two-way traffic on the trail, and trail corners. Snow trails would not be groomed beyond the width of the underlying roadbed, where one exists. Where the terrain allows, main ingress and egress snow trails that connect to the trailhead would be groomed to 18 feet wide or greater to facilitate the added traffic. Snowcats are operated at speeds in the range of 3 to 7 miles per hour. The vehicle is operated with warning lights on at all times. The maximum hours of equipment operation is generally a 12-hour day during peak season. Snow trail grooming for public OSV use would be conducted in accordance with the 1997 Snowmobile Trail Grooming Standards set by the California Off-Highway Motor Vehicle Recreation (OHMVR) Division, as follows: • Groomer operators shall be trained and directed by a grooming coordinator. • Groomer operators shall identify hazards in advance of grooming, preferably in autumn before snow falls. Grooming operations shall maintain a 10-foot vertical clearance from potential obstructions
	Would the trail cross areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	No	Signage would be installed along the Pacific Crest National Scenic Trail, to enhance wayfinding for OSV use and reduce encroachment on the Pacific Crest National Scenic Trail. Agency signage procedures would be followed. As a guideline, trail markers would be at eye level, approximately 40 inches above the average snow depth.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the trail abut a wilderness area or national park managed by other agencies?	No	N/A
	Would the trail abut a developed recreation site?	No	N/A

Table 230. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands on Bogard area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed on this trail? If so, would this affect safety and winter management of this trail?	Yes	Wheeled vehicle use is currently prohibited on trails identified for grooming from December 26 through March 31 under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind those existing wheeled vehicle prohibitions. Wheeled vehicle use would continue to be allowed on designated ungroomed routes throughout the year. Few or no conflicts would be expected.
	Would OSV use of this trail conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring federal lands.		No	N/A

Table 231. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors on Bogard area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the trail be located adjacent to neighborhoods and communities?	No	N/A
	Would OSV use of this trail be compatible with distinct characteristics of the community?	Yes	N/A
	Would the OSV trail be located adjacent Federal or State lands designated for OSV use?	No	N/A
	Would the sounds and emissions from OSV use of this trail be compatible with nearby populated areas?	N/A	N/A

Fall River Area OSV Trails

General and Specific Criteria for OSV Designated Trails (36 CFR 212.55(b))

Table 232. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources on Fall River area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the trail be located in a watershed that is of concern?	No	No trails would be designated in the Fall River area under alternatives 1, 3, 4, and 5. Only 2.1 miles of trail would be designated in the Fall River area under Alternative 2 in order to allow OSVs to cross the Pacific Crest National Scenic Trail in this area. All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. To protect watershed resources, public OSV use of trails for OSV use would not occur in wetlands unless protected by at least 12 inches of packed snow or 2 inches of frozen soil. If OSV trails must enter wetlands, bridges or raised prisms with diffuse drainage to sustain flow patterns would be used. OSV use would be prohibited on open water.
	Would the trail cross sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	No.	All trails designated for OSV use in this area would overlie National Forest System roads.
	Does the area where the trail would be located drain into a 303(d)-listed waterbody?	No	N/A
Minimize impacts on vegetation.	Would this trail cross known TES plant occurrences, particularly those that are near, at, or above the surface of the snow?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested that TES plants are being harmed in any way from OSV trail use. In all alternatives in which trails for OSV use would be designated, OSV use on designated trails would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with native soil and live vegetation as follows:

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)			Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur. Alternative 4: • No OSV trails would be designated in the Fall River OSV area under this alternative. • Cross-country OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting resources. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • No snow trail grooming would occur. Alternative 5: • No OSV trails or areas would be designated in the Fall River area under alternative 5. In all alternatives in which trails would be designated for OSV use, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use and avoid adverse impacts to TES plants. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting TES plants would be temporarily closed by order to OSV use until sufficient snow depth exists.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation. (continued)	Would the trail cross designated botanical areas (SIA, RNA)?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	N/A
Minimize impacts on other forest resources.	Would the trail cross areas that contain cultural, tribal, or historic sites?	Yes. However, all trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives in which trails for OSV use would be designated, OSV use on designated snow trails would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur. Alternative 3: • No OSV trails would be designated in the Fall River OSV area under this alternative. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • No snow trail grooming would occur. Alternative 4: • No OSV trails would be designated in the Fall River OSV area under this alternative. • Cross-country OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting resources. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • No snow trail grooming would occur. Alternative 5: • No OSV trails or areas would be designated in the Fall River area under alternative 5.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued0			In all alternatives in which trails for OSV use would be designated, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on designated snow trails and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use. The California OHMVR Division's snowcat fleet is subject to emission regulation by the California Air Resources Board (CARB) as off-road equipment. The CARB sets an emission limit for the vehicle fleet as a whole rather than for individual pieces of equipment. Based on the total horsepower of the vehicle fleet, and the model and year of the individual equipment within the fleet, CARB determines how much horsepower per year must be repowered, retrofitted, or retired. The California OHMVR Division then determines what modifications to make to its fleet in order to satisfy CARB requirements.

Table 233. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats on Fall River area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the trail cross great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?		There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to forest plan direction.
	Would the trail cross known bald eagle nest sites?		In all alternatives, other known or newly discovered active nest sites would be managed according to forest plan direction.
	Would the trail cross key deer winter range?		Action alternatives 2 through 4 would monitor deer winter range for adverse effects of OSV use on designated snow trails on the condition of deer wintering in the area. If monitoring determines adverse effects to deer resulting from OSV use on designated snow trails in winter range, these trails would be closed by order. Alternative 5 would not designate OSV areas or trails in the Fall River area.
Minimize disruption of wildlife habitats.	Would the trail cross SNYLF habitat?	No	N/A
	Would the trail cross habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?		Presently, there are no known sensitive forest carnivore den sites identified within the Fall River OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from OSV use on designated trails. If monitoring determines adverse impacts of OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from OSV use on trails designated under any alternative, we would manage the area according to forest plan direction. There have been no SNRF detections in the Fall River OSV area. Existing monitoring data indicates the interaction between SNRF and OSV use on designated trails would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued0			Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 234. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands on Fall River area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use on this trail cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	No	For groomed snow trails: The objective of minimizing conflicts between public OSV use and other existing or proposed recreational use would be addressed by prohibiting wheeled vehicle use of groomed snow trails from December 26 through March 31. The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts.
	Would the trail cross areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	No	OSV use on the Pacific Crest National Scenic Trail is prohibited, but crossing the trail would be allowed on designated snow trails. Alternatives 2 and 5 would not designate an area 500 feet to either side of the Pacific Crest National Scenic Trail for OSV use. OSV use would only be allowed in this undesignated area on designated OSV trails provided to allow OSVs to cross the Pacific Crest National Scenic Trail. No OSV trails or areas would be designated in the Fall River area under alternatives 3 through 5.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the trail abut a wilderness area or National Park managed by other agencies?		OSV use on the Pacific Crest National Scenic Trail is prohibited, but crossing the trail would be allowed on designated snow trails. Alternatives 2 and 5 would not designate an area 500 feet to either side of the Pacific Crest National Scenic Trail for OSV use. OSV use would only be allowed in this undesignated area on designated OSV trails provided to allow OSVs to cross the Pacific Crest National Scenic Trail. No OSV trails or areas would be designated in the Fall River area under Alternative 5.
	Would the trail abut a developed recreation site?		

Table 235. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands on Fall River area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed on this trail? If so, would this affect safety and winter management of this trail?	No	N/A
	Would OSV use of this trail conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring federal lands.		No	N/A

Table 236. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors on Fall River area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the trail be located adjacent to neighborhoods and communities?		No OSV trails or areas would be designated in the Fall River area under Alternative 5.
	Would OSV use of this trail be compatible with distinct characteristics of the community?	No, except for areas further removed from the lake and McArthur Burnie Falls State Park.	No OSV trails or areas would be designated in the Fall River area under Alternative 5.
	Would the OSV trail be located adjacent Federal or State lands designated for OSV use?	No	No OSV trails or areas would be designated in the Fall River area under Alternative 5.
	Would the sounds and emissions from OSV use of this trail be compatible with nearby populated areas?		No OSV trails or areas would be designated in the Fall River area under Alternative 5.
	Would OSV use of this trail conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring federal lands.		No	N/A

Fredonyer Area OSV Trails

General and Specific Criteria for OSV Designated Trails (36 CFR 212.55(b))

Table 237. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources on Fredonyer area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the trail be located in a watershed that is of concern?	No	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. Grooming of snow trails for OSV use would occur only when the ground surface is covered with adequate snowpack to prevent soil damage or soil rutting. The operator shall consider recent, current, and forecasted weather and snow conditions to ensure these conditions are met. OSV use of trails identified for grooming would occur only when and where adequate snow cover ensures negligible potential for contact with bare soil and practically no disturbance of underlying trail and road surfaces. This would prevent substantial impacts to water quality in perennial, intermittent, or ephemeral streams, or in wetlands or other bodies of water. Watershed resources would be protected by making spill containment equipment available at the facilities where grooming equipment is re-fueled. Watershed resources would be protected by designating equipment maintenance and refueling sites to ensure that they are located on gentle slopes, on uplands, and outside of riparian conservation areas and sensitive terrestrial wildlife habitats. To protect watershed resources, all stream crossings and other in-stream structures facilitating OSV passage would be designed and maintained to provide for the passage of flow and sediment, to withstand expected flood flows, and to allow for free movement of resident aquatic life (California Snowmobile Trail Grooming, California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division). To protect watershed resources, public OSV use of trails and grooming snow trails for OSV use would not occur in wetlands unless protected by at least 12 inches of packed snow or 2 inches of frozen soil. If OSV trails must enter wetlands, bridges or raised prisms with diffuse drainage to sustain flow patterns would be used. OSV use would be prohibited on open water.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)	Would the trail cross sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on designated trails would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with soil and watershed resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Does the area where the trail would be located drain into a 303(d)-listed waterbody?	No	N/A
Minimize impacts on vegetation.	Would this trail cross known TES plant occurrences, particularly those that are near, at, or above the surface of the snow?	No. No. All trails designated for OSV use in this area would overlie National Forest System roads.	
	Would the trail cross designated botanical areas (SIA, RNA)?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	N/A
Minimize impacts on other forest resources.	Would the trail cross areas that contain cultural, tribal, or historic sites?	Yes. However, all trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on trails designated for such use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use. The California OHMVR Division's snowcat fleet is subject to emission regulation by the California Air Resources Board (CARB) as off-road equipment. The CARB sets an emission limit for the vehicle fleet as a whole rather than for individual pieces of equipment. Based on the total horsepower of the vehicle fleet, and the model and year of the individual equipment within the fleet, CARB determines how much horsepower per year must be repowered, retrofitted, or retired. The California OHMVR Division then determines what modifications to make to its fleet in order to satisfy CARB requirements.

Table 238. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats on Fredonyer area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the trail cross great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – California spotted owl, northern goshawk	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to forest plan direction.
	Would the trail cross known bald eagle nest sites?	No	N/A
	Would the trail cross key deer winter range?	No	N/A
Minimize disruption of wildlife habitats.	Would the trail cross SNYLF habitat?	No	N/A
	Would the trail cross habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes	Presently, there are no known sensitive forest carnivore den sites identified within the Fredonyer OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of OSV use on designated trails to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from OSV use on designated trails under any alternative, we would manage the affected area according to forest plan direction. There have been no SNRF detections in the Fredonyer OSV area. Existing monitoring data indicates the interaction between SNRF and OSV use on trails would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the affected area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 239. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands on Fredonyer area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use on this trail cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing)?	No	For groomed snow trails: The objective of minimizing conflicts between public OSV use and other existing or proposed recreational use would be addressed by prohibiting wheeled vehicle use of groomed snow trails from December 26 through March 31. The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. OSV trail grooming would be timed to minimize impacts on non-motorized recreation experiences. The grooming season generally begins in mid-December and continues through March. Start and stop times vary per trail location and are dependent upon the presence and depth of snow. Snow trails are prioritized for grooming based on visitor use. Grooming has historically occurred several times per week. As part of this proposal, the grooming frequency on priority trails would occur several times per week and after major storms, typically between 4:00 p.m. and 6:00 a.m. Snow trails would be groomed for public OSV use to a minimum width of 10 feet and typically up to 14 feet wide. Snow trails would be groomed up to 30 feet wide in the more heavily used areas such as near trailheads. Groomed trail width is determined by variety of factors such as width of the underlying road bed, width of grooming tractor, heavy two-way traffic on the trail, and trail corners. Snow trails would not be groomed beyond the width of the underlying roadbed, where one exists. Where the terrain allows, main ingress and egress snow trails that connect to the trailhead would be groomed to 18 feet wide or greater to facilitate the added traffic. Snowcats are operated at speeds in the range of 3 to 7 miles per hour. The vehicle is operated with warning lights on at all times. The maximum hours of equipment operation is generally a 12-hour day during peak season. Snow trail grooming for public OSV use would be conducted in accordance with the 1997 Snowmobile Trail Grooming Standards set by the California Off-Highway Motor Vehicle Recreation (OHMVR) Division, as follows: • Groomer operators shall be trained and directed by a grooming coordinator. • Groomer operators shall identify hazards in advance of grooming, preferably in autumn before snow falls. • Grooming operations shall maintain a 10-foot vertical clearance from potential obstructions

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands. (continued)	Would the trail cross areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	No	N/A
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the trail abut a wilderness area or national park managed by other agencies?	No	N/A
	Would the trail abut a developed recreation site?	No	N/A

Table 240. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands on Fredonyer area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed on this trail? If so, would this affect safety and winter management of this trail?	Yes	Wheeled vehicle use is currently prohibited on trails identified for grooming from December 26 until March 31 under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind those existing wheeled vehicle prohibitions. Wheeled vehicle use would continue to be allowed on designated ungroomed routes throughout the year. Few or no conflicts would be expected.

Table 241. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors on Fredonyer area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the trail be located adjacent to neighborhoods and communities?	No	N/A
	Would OSV use of this trail be compatible with distinct characteristics of the community?	Yes	N/A
	Would the OSV trail be located adjacent Federal or State lands designated for OSV use?	N/A	N/A
	Would the sounds and emissions from OSV use of this trail be compatible with nearby populated areas?	Yes	N/A

Jonesville Area OSV Trails

General and Specific Criteria for OSV Designated Trails (36 CFR 212.55(b))

Table 242. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources on Jonesville area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the trail be located in a watershed that is of concern?	No.	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. Grooming of snow trails for OSV use would occur only when the ground surface is covered with adequate snowpack to prevent soil damage or soil rutting. The operator shall consider recent, current, and forecasted weather and snow conditions to ensure these conditions are met. OSV use of trails identified for grooming would occur only when and where adequate snow cover ensures negligible potential for contact with bare soil and practically no disturbance of underlying trail and road surfaces. This would prevent substantial impacts to water quality in perennial, intermittent, or ephemeral streams, or in wetlands or other bodies of water. Watershed resources would be protected by making spill containment equipment available at the facilities where grooming equipment is re-fueled. Watershed resources would be protected by designating equipment maintenance and refueling sites to ensure that they are located on gentle slopes, on uplands, and outside of riparian conservation areas and sensitive terrestrial wildlife habitats. To protect watershed resources, all stream crossings and other in-stream structures facilitating OSV passage would be designed and maintained to provide for the passage of flow and sediment, to withstand expected flood flows, and to allow for free movement of resident aquatic life (California Snowmobile Trail Grooming, California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division). To protect watershed resources, public OSV use of trails and grooming snow trails for OSV use would not occur in wetlands unless protected by at least 12 inches of packed snow or 2 inches of frozen soil. If OSV trails must enter wetlands, bridges or raised prisms with diffuse drainage to sustain flow patterns would be used. OSV use would be prohibited on open water.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.(continued)	Would the trail cross sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	No. All but 0.1 mile of trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on designated trails would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with soil and watershed resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.(continued)			Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Does the area where the trail would be located drain into a 303(d)-listed waterbody?	No	N/A
Minimize impacts on vegetation.	Would this trail cross known TES plant occurrences, particularly those that are near, at, or above the surface of the snow?	No. All but 0.1 mile of trails designated for OSV use in this area would overlie National Forest System roads.	N/A
	Would the trail cross designated botanical areas (SIA, RNA)?	No.	No OSV trails would be designated in any designated SIA, RNA, or other designated botanical areas.
Minimize impacts on other forest resources.	Would the trail cross areas that contain cultural, tribal, or historic sites?	Yes. However, all but 0.1 mile of trails designated for OSV use in this area would overlie National Forest System roads.	OSV use on trails designated for such use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			The California OHMVR Division's snowcat fleet is subject to emission regulation by the California Air Resources Board (CARB) as off-road equipment. The CARB sets an emission limit for the vehicle fleet as a whole rather than for individual pieces of equipment. Based on the total horsepower of the vehicle fleet, and the model and year of the individual equipment within the fleet, CARB determines how much horsepower per year must be repowered, retrofitted, or retired. The California OHMVR Division then determines what modifications to make to its fleet in order to satisfy CARB requirements.

Table 243. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats on Jonesville area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the trail cross great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – California spotted owl, northern goshawk	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to forest plan direction.
	Would the trail cross known bald eagle nest sites?	No	N/A
	Would s the trail cross key deer winter range?	No	N/A
Minimize disruption of wildlife habitats.	Would the trail cross SNYLF habitat?	Yes	This area has been managed as open to OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested the SNYLF habitat is being disrupted in any way from OSV use. None of the alternatives would authorize OSV use on trails designated for such use that contacts open water, native soil, or live vegetation. In all action alternatives, OSV use would be managed to occur on designated trails with sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows:

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)			Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)			In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on designated snow trails without adversely affecting SNYLF. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting SNYLF would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Would the trail cross habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes	Presently, there are no known sensitive forest carnivore den sites identified within the Jonesville OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of OSV use on designated trails to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from OSV use on designated trails under any alternative, we would manage the affected area according to forest plan direction. There have been no SNRF detections in the Jonesville OSV area. Existing monitoring data indicates the interaction between SNRF and OSV use on trails would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the affected area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 244. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands on Jonesville area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use on this trail cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	No	For groomed snow trails: The objective of minimizing conflicts between public OSV use and other existing or proposed recreational use would be addressed by prohibiting wheeled vehicle use of groomed snow trails from December 26 through March 31. The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. OSV trail grooming would be timed to minimize impacts on non-motorized recreation experiences. The grooming season generally begins in mid-December and continues through March. Start and stop times vary per trail location and are dependent upon the presence and depth of snow. Snow trails are prioritized for grooming based on visitor use. Grooming has historically occurred several times per week. As part of this proposal, the grooming frequency on priority trails would occur several times per week and after major storms, typically between 4:00 p.m. and 6:00 a.m. Snow trails would be groomed for public OSV use to a minimum width of 10 feet and typically up to 14 feet wide. Snow trails would be groomed up to 30 feet wide in the more heavily used areas such as near trailheads. Groomed trail width is determined by variety of factors such as width of the underlying road bed, width of grooming tractor, heavy two-way traffic on the trail, and trail corners. Snow trails would not be groomed beyond the width of the underlying roadbed, where one exists. Where the terrain allows, main ingress and egress snow trails that connect to the trailhead would be groomed to 18 feet wide or greater to facilitate the added traffic. Snowcats are operated at speeds in the range of 3 to 7 miles per hour. The vehicle is operated with warning lights on at all times. The maximum hours of equipment operation is generally a 12-hour day during peak season. Snow trail grooming for public OSV use would be conducted in accordance with the 1997 Snowmobile Trail Grooming Standards set by the California Off-Highway Motor Vehicle Recreation (OHMVR) Division, as follows: • Groomer operators shall be trained and directed by a grooming coordinator. • Groomer operators shall identify hazards in advance of grooming, preferably in autumn before snow falls. • Grooming operations shall maintain a 10-foot vertical clearance from potential obstructions

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
	Would the trail cross areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	Yes. The Pacific Crest National Scenic Trail.	All action alternatives include designated OSV trails that cross the Pacific Crest National Scenic Trail. OSV trails across the Pacific Crest National Scenic Trail would only occur on designated OSV trails. Signage would be installed along the Pacific Crest National Scenic Trail, to enhance wayfinding for OSV use and reduce encroachment on the Pacific Crest National Scenic Trail. Agency signage procedures would be followed. As a guideline, trail markers would be at eye level, approximately 40 inches above the average snow depth.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the trail abut a wilderness area or national park managed by other agencies?	No	N/A
	Would the trail abut a developed recreation site?	No	N/A

Table 245. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands on Jonesville area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed on this trail? If so, would this affect safety and winter management of this trail?		Wheeled vehicle use is currently prohibited on trails identified for grooming from December 26 until March 31 under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind those existing wheeled vehicle prohibitions. Wheeled vehicle use would continue to be allowed on designated ungroomed routes throughout the year. Few or no conflicts would be expected.
	Would OSV use of this trail conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of other neighboring federal lands.		No	N/A

Table 246. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors on Jonesville area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the trail be located adjacent to neighborhoods and communities?	No	N/A
	Would OSV use of this trail be compatible with distinct characteristics of the community?	N/A	N/A
	Would the OSV trail be located adjacent Federal or State lands designated for OSV use?	Yes. Plumas National Forest	N/A
	Would the sounds and emissions from OSV use of this trail be compatible with nearby populated areas?	No	N/A

Morgan Summit Area OSV Trails

General and Specific Criteria for OSV Designated Trails (36 CFR 212.55(b))

Table 247. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources on Morgan Summit area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the trail be located in a watershed that is of concern?	No.	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. Grooming of snow trails for OSV use would occur only when the ground surface is covered with adequate snowpack to prevent soil damage or soil rutting. The operator shall consider recent, current, and forecasted weather and snow conditions to ensure these conditions are met. OSV use of trails identified for grooming would occur only when and where adequate snow cover ensures negligible potential for contact with bare soil and practically no disturbance of underlying trail and road surfaces. This would prevent substantial impacts to water quality in perennial, intermittent, or ephemeral streams, or in wetlands or other bodies of water. Watershed resources would be protected by making spill containment equipment available at the facilities where grooming equipment is re-fueled. Watershed resources would be protected by designating equipment maintenance and refueling sites to ensure that they are located on gentle slopes, on uplands, and outside of riparian conservation areas and sensitive terrestrial wildlife habitats. To protect watershed resources, all stream crossings and other in-stream structures facilitating OSV passage would be designed and maintained to provide for the passage of flow and sediment, to withstand expected flood flows, and to allow for free movement of resident aquatic life (California Snowmobile Trail Grooming, California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division). To protect watershed resources, public OSV use of trails and grooming snow trails for OSV use would not occur in wetlands unless protected by at least 12 inches of packed snow or 2 inches of frozen soil. If OSV trails must enter wetlands, bridges or raised prisms with diffuse drainage to sustain flow patterns would be used. OSV use would be prohibited on open water.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)	Would the trail cross sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on designated trails would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with soil and watershed resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)	Does the area where the trail would be located drain into a 303(d)-listed waterbody?	No	None necessary. OSV use would not result in further impairment because the pollutant of concern is not related to OSV operation.
Minimize impacts on vegetation.	Would this trail cross known TES plant occurrences, particularly those that are near, at, or above the surface of the snow?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	N/A
	Would the trail cross designated botanical areas (SIA, RNA)?	No.	No OSV trails would be designated in any designated SIA, RNA, or other designated botanical areas.
Minimize impacts on other forest resources.	Would the trail cross areas that contain cultural, tribal, or historic sites?	Yes. However, all trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on trails designated for such use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			The California OHMVR Division's snowcat fleet is subject to emission regulation by the California Air Resources Board (CARB) as off-road equipment. The CARB sets an emission limit for the vehicle fleet as a whole rather than for individual pieces of equipment. Based on the total horsepower of the vehicle fleet, and the model and year of the individual equipment within the fleet, CARB determines how much horsepower per year must be repowered, retrofitted, or retired. The California OHMVR Division then determines what modifications to make to its fleet in order to satisfy CARB requirements.

Table 248. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats on Morgan Summit area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the trail cross great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – California spotted owl, northern spotted owl	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to forest plan direction.
	Would the trail cross known bald eagle nest sites?	No	N/A
	Would the trail cross key deer winter range?	No	N/A
Minimize disruption of wildlife habitats.	Would the trail cross SNYLF habitat?	No	N/A
	Would the trail cross habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes	Presently, there are no known sensitive forest carnivore den sites identified within the Morgan Summit OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of OSV use on designated trails to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from OSV use on designated trails under any alternative, we would manage the affected area according to forest plan direction.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)			There have been no SNRF detections in the Morgan Summit OSV area. Existing monitoring data indicates the interaction between SNRF and OSV use on trails would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the affected area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 249. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands on Morgan Summit area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use on this trail cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	No	For groomed snow trails: The objective of minimizing conflicts between public OSV use and other existing or proposed recreational use would be addressed by prohibiting wheeled vehicle use of groomed snow trails from December 26 through March 31. The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. OSV trail grooming would be timed to minimize impacts on non-motorized recreation experiences. The grooming season generally begins in mid-December and continues through March. Start and stop times vary per trail location and are dependent upon the presence and depth of snow. Snow trails are prioritized for grooming based on visitor use. Grooming has historically occurred several times per week. As part of this proposal, the grooming frequency on priority trails would occur several times per week and after major storms, typically between 4:00 p.m. and 6:00 a.m.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands. (continued)			Snow trails would be groomed for public OSV use to a minimum width of 10 feet and typically up to 14 feet wide. Snow trails would be groomed up to 30 feet wide in the more heavily used areas such as near trailheads. Groomed trail width is determined by variety of factors such as width of the underlying road bed, width of grooming tractor, heavy two-way traffic on the trail, and trail corners. Snow trails would not be groomed beyond the width of the underlying roadbed, where one exists. Where the terrain allows, main ingress and egress snow trails that connect to the trailhead would be groomed to 18 feet wide or greater to facilitate the added traffic. Snowcats are operated at speeds in the range of 3 to 7 miles per hour. The vehicle is operated with warning lights on at all times. The maximum hours of equipment operation is generally a 12-hour day during peak season. Snow trail grooming for public OSV use would be conducted in accordance with the 1997 Snowmobile Trail Grooming Standards set by the California Off-Highway Motor Vehicle Recreation (OHMVR) Division, as follows: • Groomer operators shall be trained and directed by a grooming coordinator. • Groomer operators shall identify hazards in advance of grooming, preferably in autumn before snow falls. Grooming operations shall maintain a 10-foot vertical clearance from potential obstructions.
	Would the trail cross areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	No	Signage would be installed along the Pacific Crest National Scenic Trail, to enhance wayfinding for OSV use and reduce encroachment on the Pacific Crest National Scenic Trail. Agency signage procedures would be followed. As a guideline, trail markers would be at eye level, approximately 40 inches above the average snow depth.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the trail abut a wilderness area or national park managed by other agencies?	No	N/A
	Would the trail abut a developed recreation site?	No	N/A

Table 250. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands on Morgan Summit area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed on this trail? If so, would this affect safety and winter management of this trail?	Yes	Wheeled vehicle use is currently prohibited on trails identified for grooming from December 26 until March 31 under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind those existing wheeled vehicle prohibitions. Wheeled vehicle use would continue to be allowed on designated ungroomed routes throughout the year. Few or no conflicts would be expected.
	Would OSV use of this trail conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?	No	N/A
Minimize conflicts among different classes of motor vehicle uses of other neighboring Federal lands.		No	N/A

Table 251. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors on Morgan Summit area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the trail be located adjacent to neighborhoods and communities?	Yes - Mineral	OSV use of designated trails is compatible. Mineral is predominately an OSV destination. The community relies on OSV use to attract business
	Would OSV use of this trail be compatible with distinct characteristics of the community?	Yes	OSV use of designated trails is compatible. Mineral is predominately an OSV destination. The community relies on OSV use to attract business.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors. (continued)	Would the OSV trail be located adjacent Federal or State lands designated for OSV use?	No	N/A
	Would the sounds and emissions from OSV use of this trail be compatible with nearby populated areas?	Yes - Mineral	OSV use of designated trails is compatible. Mineral is predominately an OSV destination. The community relies on OSV use to attract business.

Swain Mountain Area OSV Trails

General and Specific Criteria for OSV Designated Trails (36 CFR 212.55(b))

Table 252. §212.55(b)(1): Minimize damage to soil, watershed, vegetation, and other forest resources on Swain Mountain area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality.	Would the trail be located in a watershed that is of concern?	No.	All activities would adhere to Best Management Practices (BMPs) related to over-snow vehicle use from the 2012 USDA Forest Service National Core BMP Technical Guide and the 2011 Region 5 Soil and Water Conservation Handbook (defined in this RDEIS, appendix E). *Forest Service National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands, Volume 1 National Core BMP Technical Guide* (RDEIS appendix E) applicable to OSV use would be implemented under all alternatives. Grooming of snow trails for OSV use would occur only when the ground surface is covered with adequate snowpack to prevent soil damage or soil rutting. The operator shall consider recent, current, and forecasted weather and snow conditions to ensure these conditions are met. OSV use of trails identified for grooming would occur only when and where adequate snow cover ensures negligible potential for contact with bare soil and practically no disturbance of underlying trail and road surfaces. This would prevent substantial impacts to water quality in perennial, intermittent, or ephemeral streams, or in wetlands or other bodies of water.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Watershed resources would be protected by making spill containment equipment available at the facilities where grooming equipment is re-fueled. Watershed resources would be protected by designating equipment maintenance and refueling sites to ensure that they are located on gentle slopes, on uplands, and outside of riparian conservation areas and sensitive terrestrial wildlife habitats. To protect watershed resources, all stream crossings and other in-stream structures facilitating OSV passage would be designed and maintained to provide for the passage of flow and sediment, to withstand expected flood flows, and to allow for free movement of resident aquatic life (California Snowmobile Trail Grooming, California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division). To protect watershed resources, public OSV use of trails and grooming snow trails for OSV use would not occur in wetlands unless protected by at least 12 inches of packed snow or 2 inches of frozen soil. If OSV trails must enter wetlands, bridges or raised prisms with diffuse drainage to sustain flow patterns would be used. OSV use would be prohibited on open water.
	Would the trail cross sensitive riparian areas, for example wet meadows, bogs, fens, etc.?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on designated trails would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with soil and watershed resources as follows: <u>Alternative 2</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. <u>Alternative 3</u>: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists.
	Does the area where the trail would be located drain into a 303(d)-listed waterbody?	No	This area has been managed as open to cross-country OSV use for approximately three decades. There have been no law enforcement citations for resource damage during those three decades and no reports from the public that have suggested wet meadows are being harmed in any way from cross-country OSV use. In all action alternatives, cross-country OSV use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with open water, native soil, and live vegetation as follows:

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on soil and water quality. (continued)			Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming. o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches.
Minimize impacts on soil and water quality. (continued)			In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow cross-country OSV use. If snow depths are determined to be insufficient, designated OSV areas and trails adversely affecting sensitive riparian areas would be temporarily closed by order to OSV use until sufficient snow depth exists.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on vegetation.	Would this trail cross known TES plant occurrences, particularly those that are near, at, or above the surface of the snow?	No. All trails designated for OSV use in this area would overlie National Forest System roads.	N/A
	Would the trail cross designated botanical areas (SIA, RNA)?	No.	No OSV trails would be designated in any designated SIA, RNA, or other designated botanical areas.
Minimize impacts on other forest resources.	Would the trail cross areas that contain cultural, tribal, or historic sites?	Yes. However, all trails designated for OSV use in this area would overlie National Forest System roads.	In all action alternatives, OSV use on trails designated for such use would be managed to occur on sufficient snow depth to allow for resource protection by avoiding contact with cultural resources as follows: Alternative 2: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches. Exception is 12 inches for snow trails not overlying existing travel routes. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 3: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 6 inches where site review determines there would be no damage to underlying resources. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 18 inches. Alternative 4: • OSV use would be allowed only when forest staff determine that conditions are sufficient to allow OSV use while protecting underlying resources. This would be determined by a combination of weather station data, observations at trailheads by staff, and when the groomers decide conditions are right to commence grooming.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			o Minimum Snow Depth for Public OSV Use on Designated Snow Trails = Depth necessary to avoid resource damage. o Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = Depth necessary to avoid resource damage. o Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Alternative 5: • Minimum Snow Depth for Public OSV Use on Designated Snow Trails = 12 inches. • Minimum Snow Depth for Public, Cross-country OSV Use in Areas Designated for this Use = 12 inches. • Minimum Snow Depth for Snow Trail Grooming to Occur = 12 inches. Furthermore, almost all designated OSV trail mileage (with the exception of approximately 0.5 mile in alternatives 2 and 5) overlies a road. In all alternatives, conditions would be monitored to determine if overall snow depths are sufficient to allow OSV use on trails designated for such use and avoid adverse effects to cultural resources. If snow depths are determined to be insufficient, designated OSV trails adversely affecting cultural resources would be temporarily closed by order to OSV use until sufficient snow depth exists. To protect cultural and historic resources, foreign material may be utilized to cover historic properties under the following conditions: • Engineering staff would design the foreign material depth to acceptable professional standards; • Engineering staff would design the foreign material use to assure that there would be no surface or subsurface impacts to archaeological deposits or historic features; • The foreign material must be easily distinguished from underlying archaeological deposits or historic features; • The remainder of the archaeological site or historic feature is to be avoided, and traffic is to be clearly routed across the foreign fill material; • The foreign material must be removable should research or other heritage need require access to the archaeological deposit or historic feature at a later date; and • Indian tribe or other public concerns about the use of the foreign material would be addressed prior to use.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize impacts on other forest resources. (continued)			The California OHMVR Division's snowcat fleet is subject to emission regulation by the California Air Resources Board (CARB) as off-road equipment. The CARB sets an emission limit for the vehicle fleet as a whole rather than for individual pieces of equipment. Based on the total horsepower of the vehicle fleet, and the model and year of the individual equipment within the fleet, CARB determines how much horsepower per year must be repowered, retrofitted, or retired. The California OHMVR Division then determines what modifications to make to its fleet in order to satisfy CARB requirements.

Table 253. §212.55(b)(2): Minimize harassment of wildlife and significant disruption of wildlife habitats on Swain Mountain area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize harassment of wildlife.	Would the trail cross great gray owl, northern spotted owl, California spotted owl, and/or goshawk PACs?	Yes – California spotted owl, northern goshawk	There is no observed connection between OSV activity and northern goshawk and California spotted owl behavior on the Lassen National Forest. However, In all action alternatives, we would continue monitoring northern goshawk and California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of northern goshawk is occurring, we would mitigate according to Forest Plan direction.
	Would the trail cross known bald eagle nest sites?	No	N/A
	Would the trail cross key deer winter range?	No	N/A
Minimize disruption of wildlife habitats.	Would the trail cross SNYLF habitat?	No	N/A
	Would the trail cross habitat for marten, wolverine, or other Federally Listed or sensitive forest carnivores?	Yes	Presently, there are no known sensitive forest carnivore den sites identified within the Swain Mountain OSV area. All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of OSV use on designated trails to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. If fisher or marten den sites were discovered and subject to potential impacts from OSV use on designated trails under any alternative, we would manage the affected area according to forest plan direction.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize disruption of wildlife habitats. (continued)			There have been no SNRF detections in the Swain Mountain OSV area. Existing monitoring data indicates the interaction between SNRF and OSV use on trails would be unlikely due to opposite daily peak activity hours during the OSV recreation season. Under all alternatives, detection of an SNRF or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the affected area according to forest plan direction. Proposed project activities would cease within one mile of the current known den site and any future active wolf den or rendezvous sites during the denning period (late April to late June), to avoid human disturbance of the site. Current and future den and rendezvous sites would be closed by order to OSV use and related project activities, in consultation with a forest biologist, the Service, and California Department of Wildlife, to designate an appropriate buffer area or closure boundary. The Forest Service would provide this information to the Service and the California Department of Fish and Wildlife.

Table 254. §212.55(b)(3): Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands on Swain Mountain area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands	Would OSV use on this trail cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example, near popular quiet areas or high value areas for backcountry skiing?)	No	For groomed snow trails: The objective of minimizing conflicts between public OSV use and other existing or proposed recreational use would be addressed by prohibiting wheeled vehicle use of groomed snow trails from December 26 through March 31. The Forest Service would provide signage and electronic information to educate the public on responsible practices, trail restrictions, or separations to reduce use conflicts. OSV trail grooming would be timed to minimize impacts on non-motorized recreation experiences. The grooming season generally begins in mid-December and continues through March. Start and stop times vary per trail location and are dependent upon the presence and depth of snow. Snow trails are prioritized for grooming based on visitor use. Grooming has historically occurred several times per week. As part of this proposal, the grooming frequency on priority trails would occur several times per week and after major storms, typically between 4:00 p.m. and 6:00 a.m. Snow trails would be groomed for public OSV use to a minimum width of 10 feet and typically up to 14 feet wide. Snow trails would be groomed up to 30 feet wide in the more heavily used areas such as near trailheads. Groomed trail width is determined by variety of factors such as width of the underlying road bed, width of grooming tractor, heavy two-way traffic on the trail, and trail corners. Snow trails would not be groomed beyond the width of the underlying roadbed, where one exists. Where the terrain allows, main ingress and egress snow trails that connect to the trailhead would be groomed to 18 feet wide or greater to facilitate the added traffic. Snowcats are operated at speeds in the range of 3 to 7 miles per hour. The vehicle is operated with warning lights on at all times. The maximum hours of equipment operation is generally a 12-hour day during peak season. Snow trail grooming for public OSV use would be conducted in accordance with the 1997 Snowmobile Trail Grooming Standards set by the California Off-Highway Motor Vehicle Recreation (OHMVR) Division, as follows: • Groomer operators shall be trained and directed by a grooming coordinator. • Groomer operators shall identify hazards in advance of grooming, preferably in autumn before snow falls. • Grooming operations shall maintain a 10-foot vertical clearance from potential obstructions.

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands. (continued)	Would the trail cross areas valued for non-motorized use, including: Pacific Crest National Scenic Trail, Wilderness, Wild & Scenic Rivers, ski areas (cross-country, downhill), and/or IRAs?	No	Signage would be installed along the Pacific Crest National Scenic Trail, to enhance wayfinding for OSV use and reduce encroachment on the Pacific Crest National Scenic Trail. Agency signage procedures would be followed. As a guideline, trail markers would be at eye level, approximately 40 inches above the average snow depth.
Conflicts between motor vehicle use and existing or proposed recreational uses of neighboring Federal lands	Would the trail abut a wilderness area or National Park managed by other agencies?	No	N/A
	Would the trail abut a developed recreation site?	No	N/A

Table 255. §212.55(b)(4): Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands on Swain Mountain area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of NFS lands.	Would wheeled vehicle use over snow be allowed on this trail? If so, would this affect safety and winter management of this trail?	Yes	Wheeled vehicle use is currently prohibited on trails identified for grooming from December 26 until March 31 under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind those existing wheeled vehicle prohibitions. Wheeled vehicle use would continue to be allowed on designated ungroomed routes throughout the year. Few or no conflicts would be expected.
	Would OSV use of this trail conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs?		

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Minimize conflicts among different classes of motor vehicle uses of other neighboring Federal lands.			

Table 256. §212.55(b)(5): Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors on Swain Mountain area OSV trails

Criteria	Potential Effect Indicators	If yes, would OSV use of the trail or area cause adverse effects? If so, how?	If the trail or area is designated, what measures would be taken to manage OSV use to minimize these effects?
Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.	Would the trail be located adjacent to neighborhoods and communities?	No	N/A
	Would OSV use of this trail be compatible with distinct characteristics of the community?	N/A	N/A
	Would the OSV trail be located adjacent Federal or State lands designated for OSV use?	No	N/A
	Would the sounds and emissions from OSV use of this trail be compatible with nearby populated areas?	Yes	N/A

Appendix E. Water Quality Best Management Practices

BMP 2-25 (USFS R5 FSH 2509.22 - soil and water conservation handbook, 2011): Snow Removal Controls to Avoid Resource Damage

a. Objective: To minimize the impact of snowmelt runoff on road surfaces and embankments and to consequently reduce the probability of sediment production resulting from snow removal operations.

b. Explanation: This would be a preventative measure used to protect resources and indirectly to protect water quality. Forest roads are sometimes used throughout winter for a variety of reasons. For such roads the following measures would be employed to meet the objectives of this practice.

1. The contractor will be responsible for snow removal in a manner which will protect roads and adjacent resources.
2. Rocking or other special surfacing and drainage measures will be necessary before the operator would be allowed to use the roads.
3. Snow berms will be removed where they result in an accumulation or concentration of snowmelt runoff on the road and erosive fill slopes.
4. Snow berms will be installed where such placement will preclude concentration of snowmelt runoff and serve to rapidly dissipate melt water. If the road surface is damaged during snow removal, the purchaser or contractor will be required to replace lost surface material with similar quality of material and repair structures damaged in snow removal operations as soon as practical unless otherwise agreed to in writing.

c. Implementation: Project location and detailed mitigation will be developed by the IDT [interdisciplinary team] during environmental analysis and incorporated into the project management strategy and/or contracts. Project crew leaders and supervisors will be responsible for implementing force account projects to construction specifications and project criteria.

BMP 4-7 (USFS 2000): Water Quality Monitoring of off-highway vehicle (and OSV) Use According to a Developed Plan

a. Objective: To provide a systematic process to determine when and to what extent off-highway vehicle use will cause or is causing adverse effects on water quality.

a. Explanation: Each Forest's off-highway vehicle plan [Travel Management Plan and LRMP] will:

5. Identify areas or routes where off-highway vehicle use could cause degradation of water quality.
6. Establish baseline water quality data for normal conditions as a basis from which to measure change.
7. Identify water quality standards and the amount of change acceptable.
8. Establish monitoring measures and frequency.
9. Identify controls and mitigation appropriate in management of off-highway vehicles.
10. Restrict off-highway vehicles to designated routes.

b. Implementation: Monitoring results would be evaluated against the off-highway vehicle plan objectives for water quality and the LRMP objectives for the area. These results would be

documented along with actions necessary to correct identified problems. If considerable adverse effects are occurring, or would be likely to occur, immediate corrective action would be taken. Corrective actions may include, but would not limited to, reduction in the amount of off-highway vehicle use, signing, or barriers to redistribute use, partial closure of areas, rotation of use on areas, closure to causative vehicle type(s), total closure, and structural solutions such as culverts and bridges.

National Core BMP Rec-7. Over-snow Vehicle Use

Reference: FSM 7718

Objective: Avoid, minimize or mitigate adverse effects to soil, water quality and riparian resources from over-snow vehicle use.

Explanation: An over-snow vehicle is 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. Over-snow vehicles include snowmobiles, snowcats, and snow grooming machines. Snowmobiles and snowcats are used for access and for recreational activities. Snow grooming machines are used to prepare snow on trails for downhill or cross-country skiing or OSV use.

An over-snow vehicle traveling over snow results in different impacts to soil and water resources than motor vehicles traveling over the ground. Unlike other motor vehicles traveling cross-country, over-snow vehicles generally do not create a permanent trail or have direct impact on soil and ground vegetation when snow depths are sufficient to protect the ground surface. Emissions from over-snow vehicles, particularly two-stroke engines on OSVs, release pollutants like ammonium, sulfate, benzene, polycyclic aromatic hydrocarbons, and other toxic compounds that are stored in the snowpack.

During spring snowmelt runoff, these accumulated pollutants are released and may be delivered to surrounding water bodies. In addition, over-snow vehicles that fall through thin ice can pollute water bodies.

Use of National Forest System lands and/or trails by over-snow vehicles may be allowed, restricted or prohibited at the discretion of the local line officer.

Practices:

Develop site-specific BMP prescriptions for the following practices, as appropriate or when required, using state BMPs, Forest Service regional guidance, Forest or Grassland Plan direction, BMP monitoring information, and professional judgment:

- Use suitable public relations and information tools, and enforcement measures to encourage the public to conduct cross-country over-snow vehicle use and on trails in a manner that would avoid, minimize or mitigate adverse effects to soil, water quality, and riparian resources.
    - ♦ Provide information on the hazards of running over-snow vehicles on thin ice.
    - ♦ Provide information on effects of over-snow vehicle emissions on air quality and water quality.
- Use applicable practices of BMP Rec-4 (Motorized and Non-motorized Trails) when locating, designing, constructing, and maintaining trails for over-snow vehicle use.
- Allow over-snow vehicle use cross-country or on trails when snow depths are sufficient to protect the underlying vegetative cover and soil or trail surface.

- Specify the minimum snow depth for each type or class of over-snow vehicle to protect underlying resources as part of any restrictions or prohibitions on over-snow use.
- Specify season-of-use to be at times when the snowpack would be expected to be of suitable depth.
- Specify over-snow vehicle class suitable for the expected snowpack and terrain or trail conditions.
- Use closure orders to mitigate effects when adverse effects to soil, water quality, or riparian resources are occurring.
- Use applicable practices of BMP Rec-2 (Developed Recreation Sites) when constructing and operating over-snow vehicle trailheads, parking, and staging areas.
    - ♦ Use suitable measures to trap and treat pollutants from over-snow vehicle emissions in snowmelt runoff or locate the staging area at a sufficient distance from nearby water bodies to provide adequate pollutant filtering.

Appendix F. General Monitoring Procedures

Recreation staff and Law Enforcement and Investigations Officers regularly monitor trailheads, trails and other areas through visitation during the OSV season, trail patrols (via OSVs, skis or snowshoes) and communication with visitors and other staff (such as the groomers) to gain an understanding of the changing conditions on the forest.

1. Wilderness boundaries and other closed areas near groomed snow trails and areas designated for OSV use are visited throughout the season to determine if OSV incursions have occurred.

2. Trailheads and groomed trail areas will be visited and assessed for use conflicts and public safety concerns, coordinating and implementing site-specific controls as necessary (such as speed limits, segregated access points for motorized and non-motorized use, increased visitor information, or increased on-site management presence).

3. Areas where OSV use is restricted to designated routes will be visited to ensure public OSV use is restricted to designated routes and is not encroaching outside the trail corridor in areas where such use is not designated.

4. For any 6-inch or less minimum snow depths allowed on trails, operation of OSVs will be monitored periodically at every site where this standard will apply when snow is less than 12 inches deep.

5. Monitoring will be consistent with BMPs and focus on whether OSVs are impacting trail surfaces. The Forest Service water quality BMP 4-7 (USDA Forest Service 2000) would be followed for monitoring guidelines.

Monitoring for vegetation and wildlife effects will be conducted to achieve the following:

1. Damage to vegetation will be addressed by monitoring in consultation with forest biologists to minimize damage to vegetation by ensuring that public OSV use is not damaging sensitive resource locations. In particular, OSV use will be monitored in the white bark pine stand on Burney Mountain to determine if damage is occurring. If adverse impacts are observed, changes in management of OSV use will be considered, or other appropriate protective measures taken, in consultation with a forest botanist. Considerations will include prohibiting public, cross-country OSV use in this area by separate order.

2. Damage to vegetation will be addressed by monitoring public OSV use in designated Forest Plan botanical special interest areas (SIAs) to determine if damage is occurring. If adverse impacts are observed and it is determined that public OSV use in these areas is not compatible with the intended focus of these areas, per each special area's management plan, changes in management of public OSV use will be considered, or other appropriate protective measures taken, in consultation with a forest botanist. Considerations will include prohibiting public, cross-country OSV use in these SIAs or restricting OSV use to designated routes only.

3. Harassment of wildlife will be addressed by using the results of annual inventory and monitoring efforts for threatened, endangered, and sensitive species (northern spotted owl, California spotted owl, northern goshawk, bald eagle) to determine proximity of known nesting or roosting sites to designated OSV trails.

4. Significant disruption of wildlife habitats, public OSV use in sensitive wildlife habitats will be monitored in consultation with the forest biologist, to determine if adverse impacts are occurring. If adverse impacts are observed, changes in management will be considered in consultation with the forest biologist.

Monitoring of trailheads and groomed trail areas for use conflicts and public safety concerns would be implemented. If monitoring indicates that conflicts are occurring, the Forest Service would consider implementing site-specific controls on the Lassen National Forest as necessary (such as speed limits, segregated access points for motorized and non-motorized use, increased visitor information or increased on-site management presence).

Harassment of wildlife will be addressed by using the results of annual inventory and monitoring efforts for threatened, endangered, and sensitive species (northern spotted owl, California spotted owl, northern goshawk, bald eagle, red fox, etc.) to determine proximity of known nesting, roosting or den sites to designated OSV trails and potential effects to these species from OSV activity. Biologists on the forest monitor specific wildlife and botanical resources relative to their proximity, or sensitivity to designated OSV routes (Lieske and Frolli 2010). The region also initiated focused studies on a subset of these species, Northern goshawks (Plumas NF) and Northern spotted owls (Shasta-Trinity and Mendocino National Forests) to evaluate direct effects of interactions with OSVs during their breeding timeframes. Information from these studies is used to inform forest biologists of the potential impacts to these species from OSV use. The Regional Forester also directed each Forest with an OSV program to monitor for special status species in order to protect biological resources (Lieske and Frolli 2010).

Monitoring methodologies vary by species. Regular monitoring occurs across the forest for these species although locations vary depending upon projects. As an example, methods of monitoring for northern goshawk on the Lassen are described by Lieske and Frolli 2010) as follows: “Monitoring of NGO Protected Activity Centers (PAC, see glossary definition) is completed using a combination of Aural Broadcast Surveys and brief stand visits to locate active nests. Visits to NGO PACs for broadcast surveys or nest searches are made during the nestling and fledgling stages (June-August) when the birds are the most vocal. Goshawk monitoring has previously been conducted on Ranger Districts either by agency biologists or contractors”.

Similarly, monitoring methods for California spotted owl Protected Activity Centers (PACs) is completed using established call stations which are periodically revisited. CSO PACs are visited between April and August to survey established call stations for breeding birds, or to conduct nest searches in areas where birds were previously detected. Monitoring work has been conducted by district biologists, contractors and Southwest Research Station biologists. CSO PACs are visited on a more regular basis in accordance with regional monitoring initiatives (Lieske and Frolli 2010).

In terms of threatened and endangered botanical species and issues with regard to the spread of noxious weeds, project areas are routinely visited. As examples, known weed infestations are visited to determine changes in weed population density and rate of spread. In previous years, monitoring efforts have identified small portions (totaling 0.4 acres) of three Orcuttia tenuis occurrences that occur within 100 feet of existing or proposed designated OSV trails. For the purpose of preventing or reducing OHV and other recreation impacts, fencing/barriers are now present at two of the sites. One of these occurrences has also been monitored for three consecutive seasons and no evidence of OSV effects has been observed (Botanical Report). Continued visitation and monitoring of these and other botanical resources will continue under all alternatives.

Heritage resource monitoring efforts for potential OSV impacts are specifically designed in consultation with the State Historic Preservation Office (SHPO). The Forest will develop and implement a cultural

resource monitoring plan within 6 months of publication of the OSV FEIS/ROD. This plan will focus on testing the assumption that at least 12 inches depth of snow or ice based on weather, forest service personnel and public observations is a sufficient depth to prevent surface and subsurface impacts to historic properties. This monitoring will focus on the potential for any effects to historic properties resulting from Over Snow Vehicle (OSV) traffic when there is at least 12 inches of snow or ice coverage on the historic property. The Forest Heritage Program Manager (HPM), or qualified heritage professionals delegated by the HPMs, shall determine schedules and requirements for monitoring. Permanent records shall be completed for all monitoring events, and shall be kept on file at applicable District Offices. The Heritage Report discusses the monitoring program in more detail.

Appendix G. OSV Use Level Assumptions

Areas of Moderate to High OSV Use:

- Canopy cover less than 70 percent: CWHR vegetation (California Department of Fish and Wildlife 2014) 1S, 1P, 1M, 2S, 2P, 2M, 3S, 3P, 3M, 4S, 4P
- Slope less than or equal to 20 percent

High Use:

- Areas within 0.5 mile of OSV staging areas
- Areas within 0.5 mile of groomed trails
- Meadows within 0.5 mile of a designated OSV trail

Moderate Use:

- Areas within 0.5 mile of marked (not groomed) OSV trails
- Areas between 0.5 and 1.5 miles from groomed trails
- Meadows 10 acres or greater in size, or 0.5 to 1.5 miles from an OSV trail

Areas of Low-to-No OSV Use:

Low Use:

- Areas where OSV use is prohibited or restricted under current management. Unauthorized uses would be addressed as law enforcement issues and may prompt corrective actions.
- Areas below 3,500 feet elevation
- Canopy cover greater than 70 percent: CWHR vegetation 2D, 3D, 4D, 4M; vegetation size 5 and 6
- Slope greater than or equal to 21 percent
- Meadows 30 acres or greater, 1.5 miles or more from an OSV trail
- Areas more than 1.5 miles from a groomed OSV trail
- Areas more than 0.5 mile from a marked (not groomed) OSV trail

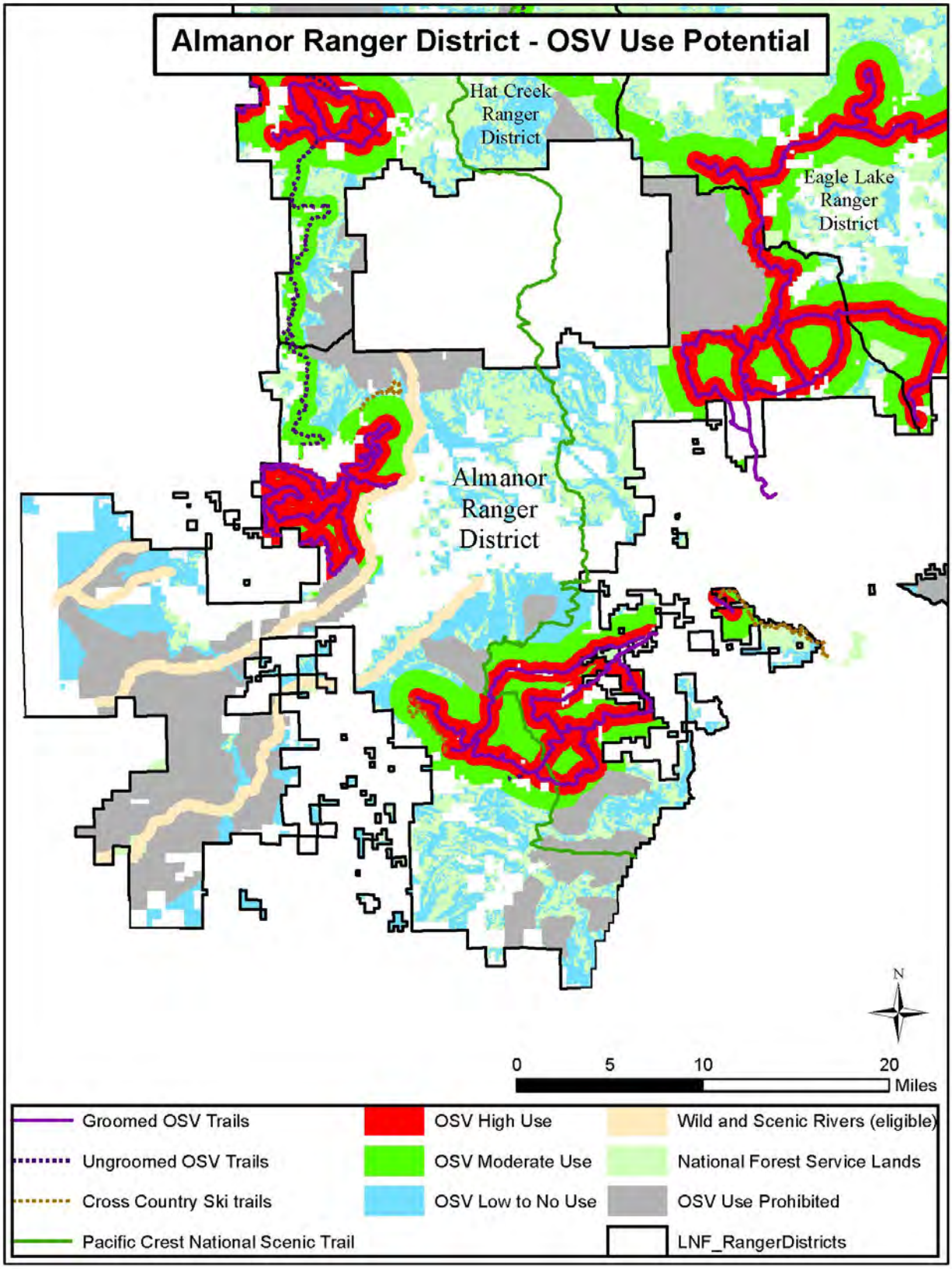

Figure 20. Over-snow vehicle use potential on the Almanor Ranger District

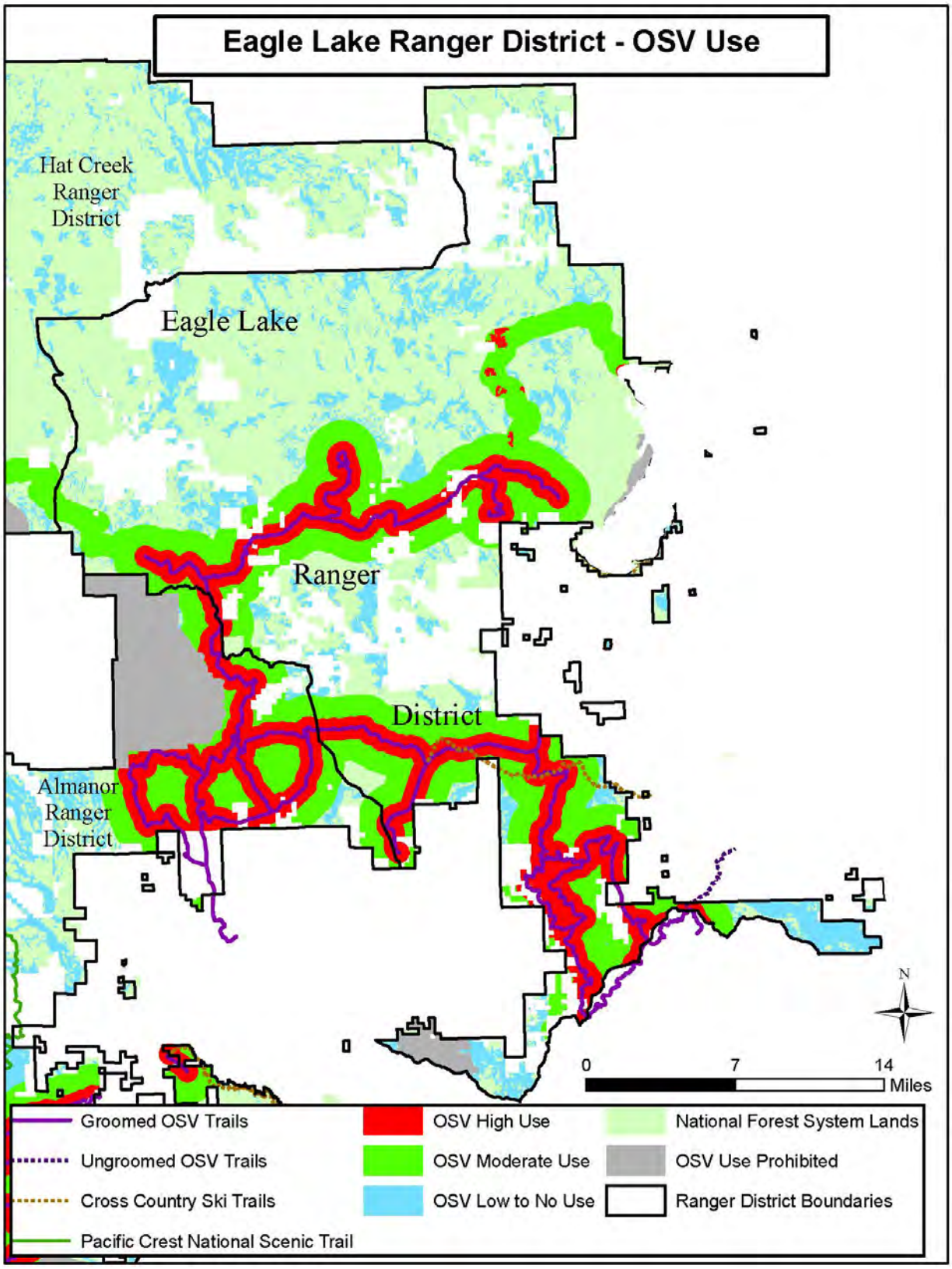

Figure 21. Over-snow vehicle use potential on the Eagle Lake Ranger District

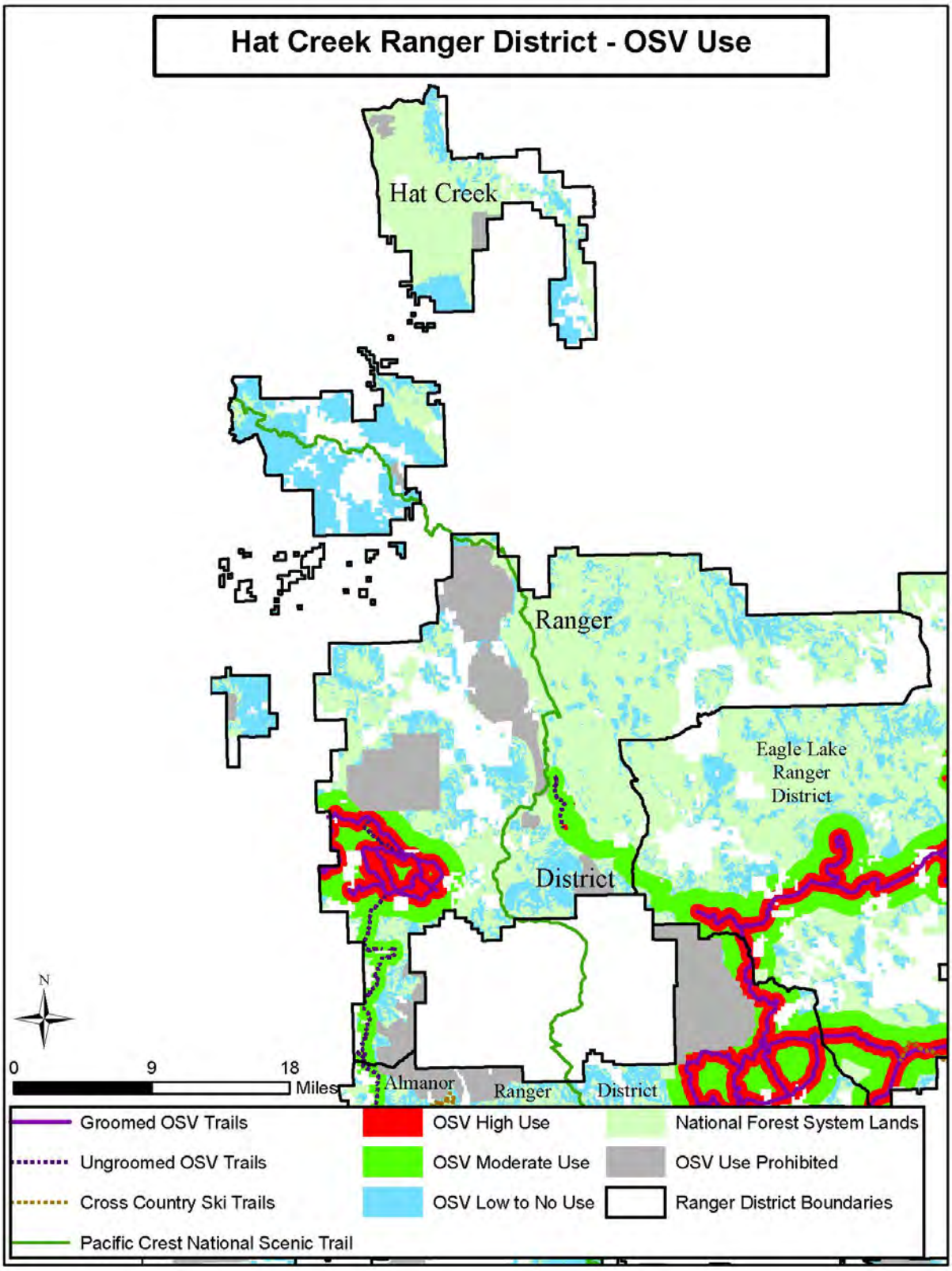

Figure 22. Over-snow vehicle use potential on the Hat Creek Ranger District

Appendix H. How Cumulative Impacts were Considered

We considered whether the potential impacts of the alternatives would accumulate with the impacts of past, other present and reasonably foreseeable future actions in both time and geographic space (FSH 1909.15, Sec. 15.2). If the proposed action or alternatives being analyzed in this RFEIS would result in no direct or indirect impacts, there could be no cumulative impacts. It logically follows that if the direct and indirect impacts of the action would occur within a different context than the impacts of past, present, and reasonably foreseeable future actions, there would also be no potential for impacts to accumulate in time and geographic space.

Consideration of Past Actions

The analysis of cumulative impacts begins with consideration of the direct and indirect impacts on the environment that are expected or likely to result from the proposed action and alternatives. Once the direct and indirect impacts are determined, we then look for existing (residual indirect) impacts of past actions.

Only those residual impacts from past actions that are of the same type, occur within the same geographic area, and have a cause-and-effect relationship with the direct and indirect impacts of the proposed action and the alternatives are considered relevant and useful for the cumulative impacts analysis.

To understand the contribution of past actions to the cumulative impacts of the alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative impacts.

The cumulative impacts analysis does not attempt to quantify the impacts of past human actions by adding up all individual residual impacts of prior actions on an action-by-action basis. There are practical reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions in the past, and isolating the impacts of each individual past action that might continue to have residual impacts would be nearly impossible.

Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative impacts of the proposed action and alternatives. In fact, focusing on individual impacts of past actions would be less accurate than looking at existing conditions. This is because there is limited information on the environmental impacts of individual past actions and one cannot reasonably identify each and every past action that has incrementally contributed to current conditions. By looking at current conditions, we are sure to capture all the residual impacts of past human actions, regardless of which particular action or event contributed those impacts.

This practice adheres to direction in the Council on Environmental Quality's interpretive memorandum of June 24, 2005, regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." For these reasons, our analysis of past actions is based on current environmental conditions.

Consideration of Reasonably Foreseeable Future Actions

Cumulative impacts can only occur when the likely impacts resulting from the proposed action or alternatives overlap spatially and temporally with the likely impacts of reasonably foreseeable future actions (FSH 1909.15, Sec. 15.2).

The Code of Federal Regulations at 36 CFR Part 220 provides direction for identifying reasonably foreseeable future actions that should be considered in the analysis of cumulative impacts. “Reasonably foreseeable future actions are those Federal or non-Federal activities not yet undertaken, for which there are existing decisions, funding, or identified proposals” (36 CFR §220.3).

“Identified proposals for Forest Service actions are those for which the Forest Service has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated (40 CFR §1508.23)” (36 CFR §220.4(a)(1)).

The relevance and usefulness of other ongoing or reasonably foreseeable future activities or events that might result in impacts that would accumulate with the specific direct and indirect impacts to specific resources depends on the context in which those direct and indirect impacts are considered. Those actions and events are discussed in the relevant resource sections.

Therefore, the other present and reasonably foreseeable future actions were considered in two phases. The first phase determined whether another present or reasonably foreseeable action was relevant and useful to the analysis. The other present or reasonably foreseeable future action would only be relevant and useful if its impacts would accumulate with the impacts of the alternative being analyzed. The second phase determined the cumulative impacts of those actions determined to be relevant and useful.

Other Present and Reasonably Foreseeable Future Actions Considered in Cumulative Impacts Analyses

Routine maintenance occurs throughout the project area on roads and in campgrounds. Routine Forest Service use of mineral material sources occurs in these designated areas throughout the project area. Routine noxious weed management (hand pulling/digging) occurs along forest roads throughout the project area. A wide range of recreational use occurs in all seasons across the forest, and forest-wide campgrounds and roads receive routine use during the months that climate conditions allow. Ongoing maintenance and use of communication sites and personal use woodcutting occur throughout the project area. Ongoing actions and reasonably foreseeable future actions include snowplowing of winter recreation parking areas.

Current Vegetation Management Activities

1. Bald Fire Salvage and Restoration
2. Jellico Fire Salvage and Restoration (Formerly a part of Bald Fire Salvage)

   Description: Proposed activities include: salvage, treatment of non-merchantable trees, removing hazard trees along roads and trails, treatment of activity slash, site preparation, and planting,. Treatments (salvage logging, roadside hazard, fuels treatment) on approximately 14,000 acres; reforestation on approximately 12,000 acres.

   Dates: sold; work to begin within 2016.

   Additional information, including maps:

   Web Link: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=45965

3. Tamarack Fire Salvage (Formerly Eiler Fire Salvage)
4. Dutch Fire Salvage (Formerly Eiler Fire Salvage)

   Description: Treat approximately 3,048 acres of area salvage (20% of National Forest System lands), 1,174 acres of roadside hazard trees (8% of National Forest System lands), 4,480 acres of fuels treatments (30% of National Forest System lands), and reforest 5,645 acres (38% of National Forest System lands) within the fire perimeter. Bring 2.4 miles of existing non-system roads (needed to implement the project for multiple entries) into the Forest road system as Maintenance Level (ML) 2 roads. These roads currently meet Forest transportation standards. Construct one-half mile of new construction that will be needed for access during project implementation and for long-term management. This road will be classified as a ML 1, and thus, not designated for wheeled motor vehicle traffic once all project activities are complete. Bring one water source proposed for use in implementing the project up to best management.

   Dates: sold; work to begin within 2016

   Additional information, including maps:

   Web Link: http://www.fs.usda.gov/project/?project=45962
5. Castle Timber Sale
6. Lassen Day Salvage Sale

   Description: Salvage of dead and/or dying trees within approximately 200 acres of the Day Fire area on the Lassen National Forest. UNIT - Hat Creek Ranger District. STATE - California. COUNTY - Lassen. LEGAL - Township 39 North, Range 5 East, Sections 13, 14, 25. Project area is located roughly 3 miles east of the town of Day and 15 miles northeast of the town of Fall River Mills.
7. Lost Timber Sale
8. Urfa Timber Sale
9. Yellow Modified Contract Timber Sale

Current Grazing Allotment Management

Grazing on range allotments is also ongoing. These allotments are shown in the following table.

Lassen National Forest active range allotments and grazing permits

Allotment	Livestock	Season of Use	AUMs
Almanor Ranger District @ 3,483 AUMs			
Antelope	Cattle	3/1 – 5/31	799
Benner Creek (one day crossing)	Cattle	6/1 – 6/1	5
Campbell Mountain	Cattle	7/1 – 8/15	44
Collins	Cattle	6/15 – 10/31	162
Cone & Ward South	Cattle	11/15 – 4/15	693
Deer Creek	Cattle	6/1 – 10/15	297
Feather River	Cattle	6/1 – 10/15	416
Lyonsville	Cattle	5/15 – 9/15	189
Martin	Cattle	6/1 – 9/30	137
Morgan Springs	Cattle	6/15 – 10/31	434
Murphy Hill	Cattle	7/1 – 9/30	199

Allotment	Livestock	Season of Use	AUMs
Soda Creek – North Butte	Cattle	6/16 – 9/15	108
Eagle Lake Ranger District @ 21,751 AUMs			
Bridge Creek	Cattle	6/1 – 9/15	1,931
Champs Flat	Cattle	6/1 – 9/30	2,515
Clover Valley	Cattle	6/1 – 8/31	399
Coyote	Cattle	6/1 -9/30	424
Diamond Mountain	Cattle	7/1 – 8/31	135
Duck Lake	Cattle	6/1 – 9/15	260
Grays Valley	Cattle	6/1 – 10/15	1,189
Gooch Valley	Cattle	6/1 – 9/30	1,191
Harvey Valley	Cattle	6/1 – 10/31	3,320
Homer Lake	Cattle	6/1 – 9/30	190
Lower Pine Creek	Cattle	6/1 – 9/9	1,995
Mountain Meadows	Cattle	6/1 – 9/15	162
North Eagle Lake	Cattle	6/1 – 9/30	1,059
Poison Lake	Cattle	6/1 – 10/15	3,555
Robbers Creek	Cattle	6/1 – 9/15	380
Silver Lake (one day crossing)	Cattle	6/1 – 6/1	9
South Eagle Lake	Cattle	5/16 – 9/30	599
Susan River	Cattle	6/1 – 9/15	785
Upper Pine Creek	Cattle	6/1 – 9/15	1,653
Hat Creek Ranger District@ 10,764 AUMs			
Bainbridge	Cattle	6/1 – 7/31	742
Bald Mountain	Cattle	4/16 – 5/31	269
Bear Valley	Cattle	6/1 – 10/15	1,271
Butte Creek	Cattle	6/1 – 9/30	858
Coyote Springs	Cattle	6/1 – 9/30	826
Dixie Valley	Cattle	6/1 – 10/15	1,261
Horse Valley	Cattle	4/16 – 5/31	338
Murken Lake	Cattle	4/16 – 5/31	409
North Battle Creek	Cattle	7/1 – 9/30	319
North Hot Springs	Cattle	4/16 – 5/31	266
North Hot Springs	Cattle	6/1 – 9/15	232
Procter Creek	Cattle	8/1 – 9/30	724
Six Mile Hill	Cattle	4/16 – 5/31	149
Soldier Mountain	Cattle	4/16 – 6/15	424
Willow Springs	Cattle	6/1 – 10/15	2,676
Total Permitted AUMs			35,998

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions on the Lassen National Forest

Lassen National Forest Almanor Ranger District (excluding projects occurring in more than one district) R5 - Pacific Southwest Region

Project Name: Big Meadows Powerline Improvement Project CE

Project Purpose: - Special use management

Planning Status: Developing Proposal; Est. Scoping Start 07/2016

Decision: Expected 08/2016

Expected Implementation: 09/2016

Project Contact: Kimberly Ganz 530-336-3383, kganz@fs.fed.us

Description: Improvement work on 12 PG&E power poles along south shore of Lake Almanor. Project will improve reliability of the Big Meadows-2101 circuit by installing mainline protective & sectionalizing devices & perform mainline proactive equipment replacement.

Location: UNIT - Almanor Ranger District. STATE - California. COUNTY - Plumas. LEGAL - T27N, R7E, Sections 10- 11 & T27N, R8E, Section 18, MDM. South shore of Lake Almanor near the small rural communities of Prattville and Canyon Dam.

Project Name: Big Springs Project CE

Project Purpose: Heritage resource management; Wildlife, Fish, Rare plants; Grazing management; Vegetation management (other than forest products); and Watershed management;

Planning Status: Developing Proposal; Est. Scoping Start 10/2016

Decision: Expected 04/2017

Expected Implementation: 07/2017

Project Contact: Bernice McProud 530 258-5129, bmcproud@fs.fed.us

Description: The Big Springs project proposes to realign fence around Big Springs and Forest boundaries, and may include limited aspen, forest health, and wildlife habitat improvement activities.

Location: UNIT - Almanor Ranger District. STATE - California. COUNTY - Plumas. LEGAL - Not Applicable. Big Springs area within the West Humbug Allotment in Humbug Valley, adjacent to private lands.

Lassen National Forest Almanor Ranger District (excluding projects occurring in more than one district) R5 - Pacific Southwest Region

Project Name: Chips Creek Bridge CE

Project Purpose: Recreation management

Planning Status: Developing Proposal; Est. Scoping Start 08/2016

Decision: Expected 11/2016

Expected Implementation: 06/2017

Project Contact: Stacy Kronner 530-258-5163, srkronner@fs.fed.us

Description: The project is intended to re-establish a safe, sustainable trail crossing over Chips Creek along the Pacific Crest National Scenic Trail for hikers and stock users.

Web link: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=46543

Location: UNIT - Almanor Ranger District. STATE - California. COUNTY - Plumas. LEGAL - sec. 7, T. 25 N., R. 6 E., MDM. In the Almanor Ranger District, Lassen National Forest, where the PCT crosses Chips Creek southeast of the Poison Springs trailhead.

Project Name: Grizzly Restoration Project EA

Project Purpose: Recreation management ; Wildlife, Fish, Rare plants; Forest products; Fuels management; Watershed management; Road management; and Research and Development

Planning Status: In Progress: Scoping Start 05/05/2015; Est. Comment Period Public Notice 08/2016

Decision: Expected 01/2017

Expected Implementation: 07/2017

Project Contact: Blair Halbrooks 530-258-5160; bhalbrooks@fs.fed.us

Description: Grizzly proposes to move Forest road 26N11 away from Scotts John Crk; increase forest resilience, decrease fuels, maintain/improve wildlife habitat through thinning and prescribed fire; and implement actions to support three research proposals

Web link: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=433323

Location: UNIT - Almanor Ranger District. STATE - California. COUNTY - Butte, Plumas. LEGAL - Not Applicable. The project area consists of four separate areas near Scotts John Creek, Grizzly Creek, Water Creek, and Yellow Creek, and ranges in elevation from 4,150 feet to 7,200 feet.

Lassen National Forest Almanor Ranger District (excluding projects occurring in more than one district) R5 - Pacific Southwest Region

Project Name: High Lakes Motorized Trail Re-routes and Staging Area Improvements EA

Project Purpose: Recreation management; Special area management; Watershed management

Planning Status: In Progress: Scoping Start 02/17/2016; Est. Comment Period Public Notice 07/2016

Decision: Expected:12/2016

Expected Implementation: 06/2017

Project Contact: Douglas Peters 530-252-6456; dwpeters@fs.fed.us

Description: Re-route and reconstruct motorized trail segments, decommission the eliminated trail segments, restore or improve dispersed recreation areas within Inventoried Roadless Area; develop a staging area outside Inventoried Roadless Area.

Web Link: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=48739

Location: UNIT - Almanor Ranger District. STATE - California. COUNTY - Plumas. LEGAL - Not Applicable. High Lakes area east of Philbrook Lake.

Project Name: Ridge Project CE

Project Purpose: Recreation management; Special area management; Vegetation management (other than forest products); Fuels management; Watershed management

Planning Status: Developing Proposal; Est. Scoping Start 08/2016

Decision: Expected:12/2016

Expected Implementation: 06/2017

Project Contact: Susan Wilcox; 530-257-4188, ext. 886; swilcox@fs.fed.us

Description: Begin post-fire restoration in Inventoried Roadless Area, and primarily promote a diversity of habitats that have been lost. Activities include some re-establishment of native conifers, and protective fuel treatments (both hand and mechanical).

Location: UNIT - Almanor Ranger District. STATE - California. COUNTY - Tehama. LEGAL - T25N,R6E, Sec 32-35; T26N,R6E,Sec 2-6 and 9-11 MDBM. East of Saucer Lake on Soda Ridge, in Soda Ridge IRA of Management Area 45, on Almanor Ranger District.

Lassen National Forest Almanor Ranger District (excluding projects occurring in more than one district) R5 - Pacific Southwest Region

Project Name: Rocks Restoration EA

Project Purpose: Wildlife, Fish, Rare plants; Forest products; Fuels management; Watershed management

Planning Status: Developing Proposal; Est. Scoping Start 10/2016

Decision: Expected:10/2017

Expected Implementation: 06/2018

Project Contact: Laura Corral 530-258-5156; lcorral@fs.fed.us

Description: The Rocks Restoration project proposes fuels reduction, vegetation management, aspen and meadow habitat improvement, and reforestation of some moderate to high severity burned areas.

Location: UNIT - Almanor Ranger District. STATE - California. COUNTY - Butte, Plumas. LEGAL - sec. 25, 26, 35, 36 T26N, R5E; sec.4, 7-10, 17-22, 25, 26, 29-31 T26N, R6E. Southwest of Humbug Valley, located in Butt Creek (MA 37), Jonesville (MA 44), and Soda Ridge (MA45) mgmt. areas.

Project Name: Storrie Aquatic Organism Passage (AOP) Project CE

Project Purpose: Wildlife, Fish, Rare plants

Planning Status: Completed

Decision: Actual: 06/09/2016

Expected Implementation: 09/2016

Project Contact: Christopher Mayes 530-258-5176; ctmayes@fs.fed.us

Description: Remove three road-stream crossing structures that are barriers to aquatic organism passage. Replace with new structures that allow aquatic organisms to pass above and below the road crossings and that are capable of passing a 100-year storm flow.

Web Link: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=46497

Location: UNIT - Almanor Ranger District. STATE - California. COUNTY - Plumas. LEGAL - Not Applicable. 3 separate project sites: NFS road 26N08 crossing Water Creek, NFS road 26N08 crossing Miller Ravine, and NFS road 26N08 crossing Rock Creek. All sites are within the Yellow Creek 5th field watershed.

Lassen National Forest Eagle Lake Ranger District (excluding Projects occurring in more than one District) R5 - Pacific Southwest Region

Project Name: Moonlight Hand Thinning Project CE

Project Purpose: Wildlife, Fish, Rare plants; Vegetation management (other than forest products); Fuels management

Planning Status: In Progress: Scoping Start 05/09/2016

Decision: Expected:07/2016

Expected Implementation: 06/2017

Project Contact: Tom Rickman 530-257-4188; trickman@fs.fed.us

Description: Hand thinning of small trees and brush along designated Forest Service roads to reduce fuels.

Web Link: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=48382

Location: UNIT - Eagle Lake Ranger District. STATE - California. COUNTY - Lassen. LEGAL - The project is located in all or portions of: T29N, R10E, Sections 13, 14, 20-29, 32-34; T28N, R10E, Sections 1, 3, 4, 10, 13, 15, 22, 23, 27, and 34; and T28N, R11E, Sections 6, 7, and 8. South of Highway 36, on the Eagle Lake Ranger District.

Project Name: Re-issuance of Eagle Lake Rec Area Special Use Permit (Concessionaire) CE

Project Purpose: Recreation management; Special use management; Facility management

Planning Status: Developing Proposal; Est. Scoping Start 07/2016

Decision: Expected:09/2016

Expected Implementation: 09/2016

Project Contact: Kirsten Pasero 530-252-5854; kpasero@fs.fed.us

Description: Re-issuing of the permit for the marina and campgrounds at Eagle Lake.

Location: UNIT - Eagle Lake Ranger District. STATE - California. COUNTY - Lassen. LEGAL - T31N,R10E, Secs10,13,14;T31N,R11E,Sec7,18. Eagle Lake Recreation Area.

Lassen National Forest Eagle Lake Ranger District (excluding Projects occurring in more than one District) R5 - Pacific Southwest Region

Project Name: Rust Resistant Sugar Pine Maintenance CE

Project Purpose: Vegetation management (other than forest products)

Planning Status: In Progress: Scoping Start 04/15/2014

Decision: Expected:07/2016

Expected Implementation: 08/2016

Project Contact: Susan Wilcox, 530-257-4188, ext.886; swilcox@fs.fed.us

Description: Thin areas around proven rust resistant sugar pine (RRSP) trees to increase sustainability by reducing direct vegetative competition, wildfire risk, over-wintering habitat for cone boring insects, and squirrel access to crowns.

Location: UNIT - Eagle Lake Ranger District. STATE - California. COUNTY - Lassen. LEGAL - T29N, R10E, sections 4, 27, 33, and 34; T30N, R9E, sections 24, 33, and 34; T31N, R9E, sections 8, 10, 16, and 17; T32N, R9E; section 2; T32N, R10E, sections 9, 10, 15, 21, 28, 32, and 33, MDB&M. Areas of treatment proposed with the Rust Resistant Sugar Pine Project are located throughout the Eagle Lake Ranger District.

Lassen National Forest Hat Creek Ranger District (excluding projects occurring in more than one district) R5 - Pacific Southwest Region

Project Name: Bailey Creek Aquatic Organism Passage (AOP) Project CE

Project Purpose: Wildlife, Fish, Rare plants; Watershed management; Road management

Planning Status: Developing Proposal, Est. Scoping Start 07/2016

Decision: Expected:09/2016

Expected Implementation: 09/2016

Project Contact: Shawn Wheelock 530-336-3340; swheelock@fs.fed.us

Description: Two existing culverts on the North & South Forks of Bailey Creek will be replaced with bridges to eliminate barriers to the passage of aquatic organisms and damage to road crossing when rivers are at high stage.

Location: UNIT - Hat Creek Ranger District. STATE - California. COUNTY - Shasta. LEGAL - T31N,R3E, S34. Lassen NF 17 Road to the west of Lassen Volcanic National Park.

Lassen National Forest Hat Creek Ranger District (excluding projects occurring in more than one district) R5 - Pacific Southwest Region

Project Name: Big Lake Restoration Project CE

Project Purpose: Wildlife, Fish, Rare plants; Vegetation management (other than forest products); Watershed management

Planning Status: In Progress: Scoping Start 04/19/2016

Decision: Expected:08/2016

Expected Implementation: 08/2016

Project Contact: Shawn Wheelock 530-336-3340; swheelock@fs.fed.us

Description: Removal of encroaching conifers, protection of a spring complex, vehicle-based damage of a meadow remediated and pre-commercial thinning in plantations.

Location: UNIT - Hat Creek Ranger District. STATE - California. COUNTY - Shasta. LEGAL - T32N, R3E, Secs 10,15,22,23,25,26. Big Lake and Red Lake areas off Lassen NF road 32N24 to the north of CA highways 89 and 44.

Project Name: Halls Flat Windthrow Project EA

Project Purpose: Forest products; Fuels management

Planning Status: In Progress: Scoping Start 03/16/2016 Est. Comment Period Public Notice 06/2016

Decision: Expected:10/2016

Expected Implementation:10/2016

Project Contact: Crystal Danheiser 530-336-3388, cdanheiser@fs.fed.us

Description: The Halls Flat Wind Thrown project is designed to salvage wind thrown trees, recover economic value and reduce fuel accumulation of material blown down in the wind event of February 6th 2015. The project area is approximately 2,000 acres.

Web Link: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=48363

Location: UNIT - Hat Creek Ranger District. STATE - California. COUNTY - Lassen. LEGAL - Not Applicable. The project is located south of Ladder Butte and is approximately 10 miles north of California State Highway 44.

Lassen National Forest Hat Creek Ranger District (excluding projects occurring in more than one district) R5 - Pacific Southwest Region

Project Name: Hat Creek Valley Powerline Spur CE

Project Purpose: Special use management

Planning Status: Developing Proposal, Est. Scoping Start 07/2016

Decision: Expected:08/2016

Expected Implementation:09/2016

Project Contact: Kimberly Ganz 530-336-3383, kganz@fs.fed.us

Description: Amend special use authorization for existing easement issued to GS&E for an extension of approximately 300 feet of overhead 12 kv pole line to provide electricity to private property in the Big Springs Estates area of Old Station, CA..

Location: UNIT - Hat Creek Ranger District. STATE - California. COUNTY - Shasta. LEGAL - T32N, R4E, Section 12, N1/2NE1/4. Lot 1 - Big Springs Estates, Old Station, CA.

Project Name: Plum Restoration Project EA

Project Purpose: Wildlife, Fish, Rare plants; Forest products; Vegetation management (other than forest products); Fuels management; Watershed management; Road management

Planning Status: Developing Proposal, Est. Scoping Start 08/2016

Decision: Expected:06/2017

Expected Implementation:06/2017

Project Contact: Greg Mayer 530-336-5521, gmayer@fs.fed.us

Description: This restoration project will encompass: surface fuels treatment for fire hazard reduction; thinning for ponderosa pine, silver sage, meadow and aspen enhancements; noxious weed treatments; and road improvements.

Location: UNIT - Hat Creek Ranger District. STATE - California. COUNTY - Lassen, Shasta. LEGAL - Townships 32, 33 & 34 North, Ranges 5 & 6 East, various sections, Mount Diablo Baseline & Meridian. The project area is located E. of Hwy 89 at the top of the Hat Creek Rim (approx. 1-1/2 miles E. of the town of Old Station), N. of Hwy 44 to Forest Road 34N49 and E. to the Butte Creek Rim.

Appendix I: Comments on the Revised Draft Environmental Impact Statement and Agency Responses

The Forest Service wishes to express its appreciation to the public for its continued input on the Travel Management Process. All comments were read by the Interdisciplinary Team. Please remember that the ultimate decision is based within the context of current laws, regulations, directives, standards and guides, and of course the Forest Plan. As with all projects, public opinion often conflicted and decisions needed to balance the legitimate concerns of many national forest recreationists as well as the need to protect our natural and cultural resources that we all enjoy.

A 45-day comment period for Lassen National Forest Over-snow Vehicle Use Designation Revised Draft Environmental Impact Statement (RDEIS) was provided for interested and affected publics, including appropriate local, State, and Federal government agencies. Letters or emails requesting comments were sent to the mailing list of interested parties maintained at the Lassen National Forest Supervisor's Office (see project file for mailing list).

A notice of availability (NOA) was published in the *Federal Register* on October 6, 2017 (82 FR 193, p. 46808). A legal notice was also published in the *Lassen County Times* (newspaper of record) requesting public comment on October 10, 2017. Outreach efforts included an email sent to 511 recipients who had previously expressed interest in this analysis. The 45-day comment period concluded on November 20, 2017.

The Forest Service received 609 comment letters from different sectors of the public, expressing a range of concerns and comments. The responsible official will consider the comments made on the RDEIS in the decision-making process. All correspondence was reviewed and our responses to these comments are located in this appendix. All correspondence received is available for public review on the Forest Service's public reading room website for this project.

The following table (table 257) lists the timely letters received. Letters are listed in alphabetical order by respondent. Table 258 is a synopsis of comments received and the Forest Service's responses to each. Table 258 is listed alphabetically by resource concern and addresses each comment by letter number and comment number. For example, sample comment number 247-16 is the 16th comment in letter number 247.

Table 257. Names of respondents who submitted comments

Last Name	First Name	Letter #
Abelin	Doug	247
Abrahams	Matthew	275
Abrams	Pinto	467
Acuna	Rafael	331
Adams	Gregory	102
Agnew	Lindsey	344
Alastuey	Stephen	613
Albaugh	Aaron	259
Albaugh	Aaron	580
Alexander	Tim	456
Amador	Don	251
Amador	Don	581
Ambrose	Caleb	22
Anderson	Alice	521
Angelo	Alexander	475
Anonymous	Anonymous	193
Anonymous	Anonymous	627
Anonymous	Keith	376
Atha	Russell	396
Augustine	Justine	246
Avery	Richard	184
Baker	Byron	182
Bakken	Luke	111
Bales	Stanley	625
Ball	Jeff	10
Baringer	William	203
Barnard	Grant	263
Barons	Richard	21
Bartkowski	Chris	156
Barton	John	264
Bastian	Steve	30
Bateman	Todd	223
Baylor	Adam	589
Bear	Bryan	307
Bekker	Gus	300
Bell	Keili	272
Bellis	Tim	48
Bender	Daryl	226
Bennett	Wolf	83
Berg	Erik	522
Bergman	Eric	109
Berry	Scott	610
Bjackson@Longlines.Co	Anonymous	414
Blakeslee	Hunter	323
Blakeslee	Tom	333
Bluestein	Sheldon	355
Bock	Jennifer	94
Bock	Jennifer	424
Bodily	Rachel	391
Boe	Dustin	578
Boe	Eric	480
Boe	Ryan	189
Boehl	Paul	532
Borowski	Jon	205
Bostrom	Peter	77
Bowen	Tyler	284
Boyd	Jason	288
Boyd	Tyler	404

Last Name	First Name	Letter #
Bracher	Taylor	71
Bradford	Kevin	198
Bradshaw	Ryan	175
Brent	Derrek	382
Bridgeman	Joyce	619
Briscoe	Ryan	174
Britting	Susan	246
Brogan	Daniel	33
Brown	Don	378
Brown	Don	389
Brown	Don	400
Brown	Don	422
Brown	Don	433
Brown	Don	443
Brown	Don	457
Brown-Silveira	Janice	618
Brown-Silveria	Mitchell	617
Brownson	Jeffrey	506
Bruns	Lesley	44
Bulger	Debbie	14
Burkhart	Matt	244
Burnett	Robert	34
Burningham	Major	408
Burrell	Shawn	510
Burroughs	Jeanne	126
Burroughs	Steve	125
Byl	Christine	98
Byler	John	426
Byrd	Justin	455
C	Garrett	528

Last Name	First Name	Letter #
Canny	Justin	31
Canny	Justin	552
Carberry	Sean	215
Carberry	Sean	406
Carey	Maggie	458
Cariglia	Renee	339
Cariglia	Renee	352
Carlson	Dave	395
Carpentier	Stefan	501
Carrico	Galen	561
Carter	Lisa	28
Carter	Lisa	121
Cassaro	David	308
Castagno	Austin	469
Cherney	Nick	53
Choate	David	168
Clark	Nate	195
Clarke	Dave	518
Cleaver	Michael	365
Cleveland	Emily	338
Clough	Avery	261
Cockcroft	Travis	124
Connelly	Bill	583
Connelly	Bill	628
Consolvo	Camille	511
Consulting	530	486
Cook	Christopher	17
Coppedge	Michael	177
Coppedge	Michael	523
Cornelius	Michele	479

Last Name	First Name	Letter #
Coultas	Charlie	442
Cox	Chet	172
Cundy	Nate	478
Dagle	Megan	379
Dailey	Joanne	239
Dakof	Jay	543
Danner	Patricia	574
Darue	Don	276
Davies	Michael	359
Davis	Daniel	555
Davis	Keith	560
Davis	Todd	24
Deaton	John	112
Delcohen	Shane	602
Delloiacono-Thies	Tara	598
Deruiter	Darla	25
Deruiter	Darla	514
Devries	Jeffrey	547
Deyerberg	Rob	544
Ditsworth	Joshua	448
Doherty	Dana	471
Donnellan	John	85
Douglas	Barbara	357
Douglas	Georgi	52
Douglas	Mike	381
Dowdy	Judy	371
Dunham	Frances	319
Dunlavy	Claudia	211
Dunn	Travis	160
Durnal	Steve	410

Last Name	First Name	Letter #
Eames	Cliff	545
Ebertz	Kirk	534
Eckel	Isaac	418
Eddy	Tim	571
Edwards	Susan	123
Eide	Kristian	63
Eischens	Gary	500
Eisen	Hillary	254
Elba	Brendan	278
Elling	Rich	209
Erdoes	Jeff	232
Ericsin	Donald	180
Ervin	Jamie	62
Ervin	Jamie	317
Etter	Susan	601
Farley	Bill	139
Farny	Cindy	32
Felker	Kyle	243
Felton	Kevin	170
Fenwick	Tom	295
Fereday	Wyatt	76
Ferguson	Ben	407
Ferlisi	Tony	557
Ferrell	Gail	477
Ferrell	Gail	489
Fiebig	Michael	586
Fiebig	Mike	364
Fields	Jordan	454
Finkel	Phil	235
Finn	Brian	445

Last Name	First Name	Letter #
Fiore	David	626
Fischer	Greg	488
Fish	Chris	370
Fishel	Michael	290
Fix	Matt	325
Flanagan	Jon	347
Fleming	Jaclyn	576
Flint	Allison	246
Florence	Richard	296
Fogg	Jora	47
Fogg	Jora	246
Ford	Aaron	362
Forsyth	Colin	20
Fox	Marla	65
Fox	Marla	255
Frank	Sterling	327
Gallagher	Clare	595
Gallo	Steve & Hei	438
Gardiner	Kelby	492
Gardner	Jessica	18
Gardner	Murphy	435
Gates	Kraig	155
Geer	Todd	186
Geer	Todd	187
Geer	Todd	188
Gibson	Jim	254
Gibson	Jim	584
Gillette	Ryan	499
Gilsdorf	Bruce	548
Gilsdorf	Cindy	548

Last Name	First Name	Letter #
Gilsdorf	Evan	548
Gilsdorf	Tyler	548
Goins	Derek	241
Goldberger	Andrea	267
Gordon	Ed	159
Gordon	Thomas	66
Grabowski	Zbigniew	374
Graves	Eric	334
Greenhalgh	Jordan	361
Guenther	Quinton	340
Guild	Jeffrey	294
Gunsauls	Seth	271
Gustafson	Peggy	185
Gutierrez	Mona	49
Gyorfi	Jessicale	238
Gyorfi	Michael	236
Hagwood	Gregory	231
Hallstein	Harold	27
Hallstein	Harold	484
Hallstein	Harold	594
Harkness	Laurel	289
Harmon	Ginger	504
Harvey	Ramsey	503
Hatch	Brad	97
Hawkins	S.	218
Hawks	Steve	212
Healion	Rose	13
Hejna	Joe	460
Helfand	Gary	9
Helfand	Gary	329

Last Name	First Name	Letter #
Helin	Dustin	575
Henderson	Mike	468
Henkle	Jason	86
Herford	Spencer	388
Herrick	Jim	554
Hesler	Nancy	604
Hilbun	Rich	446
Himick	Jason	61
Hoesel	Rich	273
Hoffmann	JANET	240
Hogan	Glen	133
Holland	Em	350
Holten	Aaron	526
Horgan	Alex	322
Hotz	Charlie	11
Howell	Samuel	567
Hudig	Dorothy	217
Hudig	Dorothy	620
Hudobnik	Monika	512
Hughes	Brian	346
Hughes	Susan	104
Hulm	Jim	336
Hulverson	Kevin	403
Hutchison	Dewey	178
Iisagor	Susan	298
Jacob	Oren	266
Johns	Dalton	214
Johns	Todd	213
Johns	Todd	231
Johnson	Curt	234

Last Name	First Name	Letter #
Johnson	Donna	233
Johnson	Mark	309
Johnston	Aaron	106
Jolly	Chelsea	513
Joned	Matt	324
Jones	Brittany	411
Jones	Casey	140
Jones	Charlie	562
Jones	Jeremy	430
Jones	Scott	629
Joy	Jon	394
Jury	Darrel	250
Kane	Jenna	588
Kasieta	James	149
Kavanaugh	Michael	45
Kedish	Eric	143
Kell	John	431
Kennedy	Shaun	150
Kepler	Jeffrey	564
Kessler	Marc	315
Kimiecik	Andrew	549
King	Becky	119
King	David Harve	332
King	Tyler	69
King	Tyler	358
Kinloch	Patrice	537
Kirkland	Alexander	291
Knifong	Kyle	449
Knutsen	Andrew	147
Knutsen	Dale	6

Last Name	First Name	Letter #
Kobert	Jordan	498
Koger	Justin	287
Kooyman	Justin	196
Kopec	Len	551
Kopnisky	Karla	279
Kreidler	Jeffrey	105
Kreidler	Jeffrey	550
Krevitsky	Todd	131
Kroening	Andrew	154
Kurtz	John	343
Kustanovich	Vladimir	113
Lagasse	Brennan	476
Lake	Michael	19
Lally	Ranbir	423
Lamppert	Jeff	56
Lampshire	Richard	535
Lane	Tim	39
Langhans	Wolfgang	342
Larson	Anthony	88
Lashure	Brandon	427
Lattka	Franz	15
Lattka	Franz	210
Lawrence	Jean	377
Lazzareschi	Iris	419
Lazzarino	Corky	623
Leadbetter	Gig	313
Leavell	Bill	441
Leidholt	Cole	301
Leidholt	Laurin	375
Leven	Brody	75

Last Name	First Name	Letter #
Levy	Sari	107
Lheritier	Alex	57
Libkind	Marcus	363
Lindholm	Karin	519
Link	Spencer	405
Livingston	Bruce	202
Lizewski	Edward	286
Lobeck	Mike	496
Lockard	Tim	463
Loeffler	Jonathan	50
Loeffler	Jonathan	420
Lofgren	Joe	281
Logan	Catherine	35
Logan	Catherine	337
Logan	Jesse A.	593
Loggins	Kyle	520
London	Aaron	387
Loomis	Jody	247
Lovejoy	Leslie	67
Luebke	Kelly	285
Macintosh	Chris	12
Macintosh	Chris	428
Macquarie	Anne	614
Macquarie	Charles L	611
Malmborg	Eric	59
Maness	David	368
Manzi	Dan	415
Marancik	David	8
Marderosian	Ara	269
Marrone	Chris	100

Last Name	First Name	Letter #
Marrou	Jordan	153
Martinez	Luke	527
Martyn Goforth	Kathleen	579
Mason	Brooks	444
Max	Tom	516
May	Michele	26
Mcclay	Kerry	538
Mcclay	Martha	482
Mcclay	Michael	386
Mcclelland	Duncan	92
Mccormick	Alyson	348
Mccurdy	Michael	524
Mcdonald	Pat	416
Mcfarland	Richard	531
Mchugh	Michael	89
Mckinney	Kevin	282
Mcmillen	Donald	603
Mcnatt	Randy	606
Mcniven	Ian	136
Mcniven	Ian	292
Mcvey	Jared	165
Mcvey	Jared	176
Mcvey	Kaitlyn	166
Mcvey	Sheila	230
Mcvey	Steve	228
Menlove	Mark	439
Menlove	Mark	600
Meyer	Rich	399
Meyer	Tony	553
Miller	Jon	43

Last Name	First Name	Letter #
Milligan	Sylvia	257
Milligan	Sylvia	622
Mironov	Anton	432
Mitchell	Carol	227
Mitchell	Dave	222
Mitchell	Lynne	41
Mitchell	Steven	173
Mitchell	Steven	316
Moak	Peggy	628
Molina	Jason	434
Moore	Elizabeth	265
Morgan	Darca	249
Morosini	Chris	283
Morrill	Maxwell	421
Morrison	Bobbie	220
Morrissey	Matthew	318
Morrow	Steve	206
Morse	Leigh	268
Muhlbach	Scott	162
Muir	Matt	37
Munson	James	579
Murphy	Michael	181
Murray	Dan And Liz	110
Nadison	Jeremy	491
Nayduch	Ross	367
Nelson	Daniel	453
Nemir	Phil	229
Newton	Phil	450
Nicholas	Barbara	303
Nicholas	Marty	425

Last Name	First Name	Letter #
Nicolosi	Dominic	507
Nilsson	Lina	74
Noble	Aaron	354
Nolthenius	Richard	116
Norton	Elizabeth	252
O'Connor	Benjamin	304
Oder	Stephen	80
Oder	Stephen	341
Ogrady	Tommy	385
O'Hare	Mick	306
Oliver	Eric	73
Oliver	Eric	310
Olsen	Susan	417
Olson	Eric	326
Ombach	Jay	40
Ondracek	Ronald	208
Orourke	Jesse	146
O'Rourke	Jesse	114
Ortiz	Brendan	558
Osburn	Kenneth	225
Otterstatter	Keith	190
Owen	Nick	392
Painter	Michael	237
Pantaleoni	Darin	221
Parker	Michelle	509
Parrillo	Lisa	46
Patmont	Calvin	58
Pavkovich	Anthony	402
Peisner	Ian	82
Pelkie	Brenden	93

Last Name	First Name	Letter #
Pelletier	Dennis	293
Pence	Levi	151
Pence	Levi	169
Person	John	242
Peterson	Dave	99
Pfyl	Joey	429
Phillips	Chris	23
Phillips	Faye	84
Pointer	Brad	490
Polczynski	Eric	517
Polivy	David	42
Pomeroy	Tracey	101
Poon	Ming	462
Poon	Victor	38
Potter	Chris	505
Pugmire	Eric	179
Puterbaugh	Patricia	246
Puterbaugh	Patricia	256
Puterbaugh	Patricia	624
Quinn	Casey	134
Rae	Aaron	401
Raymond	Charles	353
Reichel	David	568
Repanich	Nick	194
Repetto	Anna	539
Repetto	Bill	536
Reynolds	Steve	330
Rhode	Kurt	245
Richards	Michelle	29
Ricklefs	Brian	191

Last Name	First Name	Letter #
Ricks	Colby	270
Ringer	Ryan	142
Rivens	Donald	246
Rivers	Kathleen	461
Robbins	Jonathan	542
Roberts	Sam	312
Rodriguez	Fernando	91
Rolfs	Mike	349
Rolfs	Mike	585
Rolph	Decker	54
Rolsma	Royce	262
Romero	Isaac	437
Rommel	Jeff	192
Ronsheimer	Diane	605
Rosine	Jonathan	145
Ross	Jerry	132
Rossi	Sam	487
Rowen	Bob	200
Rowen	Bob	582
Runyon	Jessica	351
Rush	Ryley	373
Russell	Nick	314
Russell	Rob	384
Rutt	Tracy	117
Sack	Ryen	157
Sagan	David	171
Sales	Victor	277
Sall	April	587
Salo	Ken	247
Sanders	James	413

Last Name	First Name	Letter #
Sanders	Seth	530
Sanford	Jill	591
Saperston	Adam	64
Scherpbier	Gerben	120
Schladweiler	Joe	566
Schmerker	Jeff	590
Schmidt	Catherine	216
Schneider	Wendy	596
Schulte	Adrian	390
Schwab	Jameson	508
Schwartz	Ephraim	474
Scissors	Kenneth	78
Scott	Andrew	556
Scott	Eric	115
Searle	Ryan	164
Seisler	Kali	494
Seitz	Natalie	546
Serr	Deven	130
Shaw	Ed	609
Shaw	Tony	259
Shearer	Forrest	451
Sherman	Mike	436
Shimabuku	Morgan	55
Shoemaker	Karen	345
Sinclair	Benjamin	470
Sinsheimer	Amy	540
Slette	Hans	122
Smith	Kenneth	224
Smith	Oliver	260
Smith	Steven	2

Last Name	First Name	Letter #
Smith	Steven	204
Snyder	Jared	525
Solomon	Glenn	356
Solomon	Ronald	183
Sorensen	Jack	612
Soriano	Israel	397
Spero	Scott	144
St.Charles	Wil	274
Standon	Jennifer	497
Stanley	Brent	328
Steidayer	Michael	305
Steidlmayer	Kolby	118
Stein	Max	495
Stock	Joe	103
Stokes	Harry B. (B	616
Stokes	Matt	152
Stokes	Nancy	615
Stone	Randy	95
Story	Frank	197
Stover	Sharon	473
Street	Pam	398
Stroh	Randi	464
Strohacker	Eric	36
Strong	Katherine	569
Suk	Tom	360
Sullivan	Jerry	199
Swart	Wendy	96
Sweepe	Keith	629
Sweet	Ned	541
Swift	Tim	372

Last Name	First Name	Letter #
Szumel	Leo	5
Tatsugawa	Kevin	311
Taylor	Von	87
Tennigkeit	Marcus	127
Tomlinson	Scott	158
Tucker	Chuck	481
Turiano	Thomas	393
Tyler	Helen	608
Van Velsor	Stan	246
Vance	Rick	81
Vanderhagen	Terry	570
Vandeusen	Charles	90
Visinoni	Andee	129
Visinoni	Mike	128
Visinoni	Mike	559
Wagner	Stacy	68
Wagnon	Wes	60
Waitt	Dan	573
Wakefield	Brendan	335
Walker-Drennan	Matt	515
Walter	Becky	572
Wang	Anie	207
Wang	Anne	1
Ward	Shawn	148
Watt	Satah	563
Watters	Ron	70
Weaver	Craig	466
Weed	Liam	366
Weiers	Joseph	138
Weiler	Holly	79

Last Name	First Name	Letter #
Weir	Tom	577
Weisman	Will	51
Weisman	Will	565
Wells	Michael	280
Welsch	Evan	447
Wener	Tina M.	607
Wesley	Chase	299
Westphal	Michael	135
Whitaker	Howard	7
Whitaker	Howard	201
White	Charles	459
White	Scott	592
White	Stephanie	483
Whitten	Candace	485
Wickham	Ben	597
Wiebe	Albert	16
Wilensky	Kyle	321
Wiley	Fred	629
Williams	Bob	141
Williams	John	137
Williams	Patrick	409
Willits	Ryan	465
Wilusz	Kim	163
Wilusz	Ryan	161
Winkelman	Alyssa	599
Winkler	Luke	502
Winston	Barry	369
Witschard	Moe	529
Wolf	Charles	167
Wong	Mark	320
Wood	Connor	383
Wood	Mark	219
Wood	Mark	452
Wood	Ryan	472
Wood	Stephen	72
Woodruff	Charlie	297
Woods	David	380
Woolard	Nick	493
Wuilliez	Nicholas	412
Yaeger	Mike	302
Yale	Laura	533
Zanto	Aaron	108
Zook	Dave	440
Zuliani	Donald	642

Table 258. Public Comments by Resource

Resource	Sample Comment Number, and Public Concern	Agency Response
Air Quality	247-16: Comment questions whether carbon dioxide is a factor in restricting OSV use.	247-16: Thank you for your comment. The comment identifies an error in the disclosure. The issue is carbon monoxide (CO) instead of carbon dioxide (CO_2). Therefore page 232-234 of the RDEIS should state: "Current emissions generated as a result of OSV use on the Lassen are estimated to contribute less than 1 percent (0.0011 percent of carbon monoxide (CO), 0.000016 percent of nitrogen oxide (NOx) and 0.0019 percent of particulate matter (PM)) of pollutants to the seven air districts within the Lassen National Forest." This language has been corrected in the Revised FEIS.
Air Quality	153-3, 165-4: Cars, logging, and ski resorts put out millions of tons more pollution in a day than all snowmobiles combined do in a year. The number of snowmobiles polluting the environment is dwarfed by the number of Subarus and Prii heading from the Bay Area to the mountains every winter. If they're concerned about pollution, don't drive here.	153-3, 165-4: Thank you for your comment.
Air Quality	153-3, 187-7, 208-9: Snowmobiles have pretty strict pollution standards now-a-days. Snowmobiles manufactured in the recent years meet all the high EPA standards for pollution and noise levels. Some of the "older" machines do not meet these standards and eventually, the older machines will be removed from service due to the high cost of maintenance.	153-3, 187-7, 208-9: Thank you for your comment. We agree that there are fewer of the older OSVs every year and the older OSVs may not meet EPA standards for pollution and noise. However, we would not regulate OSV noise or emissions in any alternative and the reasons are explained in the RDEIS (page 54).
Botany/ Invasives	250-7ab: Shasta OSV Area: The Mayfield candidate Research Natural Area (cRNA) protects 1000 acres of Knobcone pine (*Pinus attenuata*) in the northwestern portion of the proposed Shasta OSV Area. We support the Lassen National Forest decision to restrict OSV use in the Mayfield cRNA. Two areas between the Timbered Crater and Mayfield RNAs are designated Semi-Primitive Non-Motorized (SPNM) in the Lassen Land & Resource Management Plan (1992). We strongly believe OSV use should be restricted in these SPNM areas. · To maintain the extent of the Mayfield population of Knobcone pine, designate the cRNA as a RNA.	250-7ab: After reviewing this comment and all alternatives, we noticed that semi-primitive non-motorized (SPNM) areas would have been designated for OSV use in some of the alternatives being considered in detail. Designation of these SPNM areas for any kind of motorized use would not be consistent with forest plan direction. We modified the alternatives to be consistent with the forest plan. No areas designated with the Recreation Opportunity Spectrum classification of semi-primitive non-motorized (SPNM) would be designated for OSV use in any of the action alternatives. The purpose of this analysis is to designate areas and trails for over-snow vehicle use as required by the travel management regulations at 36 CFR Part 212, Subpart C. The Forest Service is not required to amend its land management plan to manage OSV use on the forest. The Mayfield candidate RNA would not be designated for OSV use in any alternative analyzed in detail in the RDEIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Botany/ Invasives	250-7d: Bogard OSV Area: The Murken Bench Botanical Special Interest Area is located just east of the SPNM areas. · To protect unique plant species found in the Murken Bench Botanical Special Interest Area. Prohibit OSV use in the SIA.	250-7d: The RDEIS analyzes one alternative (alternative 5) in detail in which the Murken Bench Special Interest Area would not be designated for OSV use. The Murken Bench Special Interest Area would be designated for OSV use in alternatives 1 through 4 and the environmental effects of that designation are disclosed in the RDEIS (Chapter 3).
Botany/ Invasives	250-7aa: Shasta OSV Area: The area contains globally and regionally unique plant species. The Timbered Crater recommended Research Natural Area (rRNA) contains a portion of the largest population of Baker cypress (*Cupressus bakeri*) in the world. Baker cypress is listed as a Vulnerable, Threatened species by the International Union for the Conservation of Nature. This population of Baker cypress is one of only eleven locations on the planet where the species is found. The 1777-acre Timbered Crater rRNA protects a portion of the 7000-acre stand of Baker cypress. We recommend that OSV use be restricted in the entire Baker cypress stand. To have the Timbered Crater population of Baker's cypress remain the largest population of the species on the planet: 1. Have the species down-listed from Vulnerable to Near Threatened. 2. Designate the rRNA as a RNA.	250-7aa: None of the alternatives analyzed in detail would designate the 1,777-acre Timbered Crater recommended RNA for OSV use. The remainder of the 7,000-acre Baker cypress stand would not be designated for OSV use in alternative 5.
Botany/ Invasives	250-7ad: Swain Mountain OSV Area: The Swain Mountain area also includes the Willow Lake Bog Botanical Area, south of Lassen Volcanic National Park. · Restrict OSV use in the Willow Lake Bog Botanical Area.	250-7ad: All alternatives analyzed in detail in the RDEIS would designate the Willow Lake Bog Botanical Area for OSV use. However, proposed OSV designations in the Willow Lake Bog Botanical Area would not result in any long-term effects that would be detrimental to the features in the area. Willow Lake Bog Botanical Area encompasses 60 acres, most of which is open water. OSVs would not be authorized to operate over lakes, so the area would receive little OSV use. Due to the restrictions on OSV use on lakes, and minimum snow depth requirements, OSV use is not expected to alter any of the vegetation and habitat characteristics for which the Special Interest Area was established (RDEIS page 364).
Botany/ Invasives	250-7o: Jonesville OSV Area: Do not designate Several Research Natural Areas located within the Jonesville OSV Area for OSV use: The 3,922 acre Cub Creek RNA was established to study mixed conifer forest in a tributary to Deer Creek. The 1,300 acre Soda Ridge recommended RNA targets white fir forests along Soda Creek. The 1,185 acre Green Island Lake recommended RNA protects a moss bog at the headwaters of Soda Creek.	250-7o: None of the alternatives analyzed in detail would designate these three areas for OSV use.

Resource	Sample Comment Number, and Public Concern	Agency Response
Climate Change	C/R #44 (General Climate Change): Comment cites a study showing winter snow levels are rising due to climate change. Air temperatures are increasing, less precipitation is falling as snow, winter seasons are becoming shorter, and snow packs are being reduced. Studies of wildlife dependent upon snow predict their available habitat will be reduced, thus diminishing their likelihood of survival. The comment states that the proposed designations fail to consider these factors and the potential for increased conflicts between winter uses.	C/R #44 (General Climate Change): We are constantly managing the OSV program on the Lassen National Forest and modifying management based on resource conditions. Climate change is assumed to occur and would result in changes to resource conditions. As the climate changes and snow levels rise, the area on the Lassen National Forest with sufficient snow for OSV use would be reduced. The analysis of each alternative in the RDEIS considers climate change as a factor in future environmental conditions, where relevant. Effects to soil are considered on page 205; environmental justice effects are considered on pages 245 to 257; effects to hydrological features are considered on page 278; effects to wildlife are considered on pages 466, 490, 505, 514, 516, 529, 539, 542, 543, 544, and 545; effects to aquatic species are considered on page 616. If new information or changed circumstances relating to the environmental impacts of an action come to the attention of the responsible official after a decision has been made, the responsible official would review the information carefully to determine its importance. Consideration would be given to whether or not the new information or changed circumstances are within the scope and range of effects considered in the original analysis. If a correction, supplement, or revision to the environmental document is necessary, the responsible official will do so.

Resource	Sample Comment Number, and Public Concern	Agency Response
Climate Change	250-9a: Standards and guidelines for winter recreation must be able to adapt to a rapidly changing climate. Climate science in the Northern Sierra is documenting warmer temperatures, shorter winter seasons and less precipitation falling as snow, resulting in a smaller snowpack. This climate research emphasizes the need for winter recreation minimum snow depth standards as OSV enthusiasts will have less snow to play on. We understand that minimum snow depth standards will be difficult to monitor and enforce because snow depths and densities vary considerably across the landscape. We believe snow depth monitoring should focus on staging areas as these areas experience high use and are typically at lower elevations where there is less snow, thus there is typically more resource damage in these locations.	250-9a: Thank you for your comment. The Forest Service is considering variations in snow depth among the five alternatives. These vary from no designated minimum snow depth to 12 inches minimum snow depth for both trail and cross-country OSV travel. We understand that snow depth varies considerably and is a very difficult characteristic to measure consistently across the forest. Our decision will reflect a minimum depth that is supported by staff expertise and/or any available data and that best protects natural and cultural resources and forest infrastructure. Observations based on staff experience, conversations with OSV enthusiasts and experience from other national forests also support our assumption that OSV enthusiasts will not typically operate their machines on limited snow. Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12 inches depth). Measurements only at staging areas provides a biased assessment of overall snow depth across the forest as these areas typically receive the most direct sunlight and lose snow at a greater rate than most other areas of the forest. Although the Forest Service may decide to manage for a given minimum snow depth in terms of opening or closing areas based on current conditions, or restricting OSV use temporarily until snow depths general meet minimum depth, observations of resource damage will be the primary enforcement tool.
Cultural	182-4: Comment asserts that the SHPO has no records of OSV damage to sensitive historical sites over the last five years and there is no threat that OSV use would damage historical sites.	182-4: This concern will be addressed in the Revised FEIS by the cultural resource specialist. The State Historic Preservation Officer (SHPO) does not track OSV damage. In the last five years, approximately 100 sites have been impacted by OHV use and our monitoring does not differentiate between OHV and OSV impacts. The impacted sites constitute 8 percent of the sites on the Lassen National Forest. Over-snow vehicles are considered one form of Off-Highway Vehicles. All forms of Off-Highway Vehicles have been shown to “damage soils directly through (1) disruption of the surface soil and (2) compaction of the surface soil and subsoil (e.g., Belnap 1995, 2002; Dregne 1983:26; Webb et al. 1978:228-232). The most important long-term effect of OHV use on public lands is the accelerated erosion and the attendant inability to support natural revegetation (Webb et al. 1978:219).” In addition, “when the soil is wet, the destruction caused by the passing of a single vehicle track is more pronounced, due to increased soil compaction.” Because over-snow vehicle use that occurs without snow cover often occurs when the soil is wet, over-snow vehicles have a higher potential to compact and disrupt archaeological soils.

Resource	Sample Comment Number, and Public Concern	Agency Response
Cultural	208-10: Comment asserts that there is no record of OSV use causing serious resource damage.	208-10: The Forest Service is also not aware of any significant resource damage specifically caused by OSV use. OSVs have been operated in the Lassen National Forest on existing identified OSV trails and in existing identified OSV areas for decades with no record of impacts to forest resources or use conflicts specifically attributed to OSV use. In the last five years, approximately 100 cultural resource sites have been impacted by OHV use. Some if these impacts may be from OSV use, but our monitoring does not differentiate between OHV and OSV impacts. We completed an Environmental Assessment of OSV use on the Lassen National Forest in 1989. That Environmental Assessment identified areas of potential adverse impacts to natural and cultural resources, and we did not establish OSV trails in the areas where these resources would be adversely affected. Furthermore, we know other forests have recorded resource damage and use conflicts and we have law enforcement reports of inadvertent OSV incursions into areas where OSV use is not designated and would not be designated for OSV use in this decision, such as Wilderness. For the current designation process, utilizing minimization criteria, we identified some areas where potential adverse impacts or use conflicts might be possible and minimized those effects where they have the potential to occur.
Cultural	243-7: Comment asserts that there will never be any archaeology site resource damage from OSV use.	243-7: Thank you for your comment.
Cultural	250-7l: Fredonyer OSV Area: The Homer / Deer Special Interest Area is located on the north side of Keddie Ridge, in the eastern portion of the Fredonyer OSV Area. Keddie Peak and the lakes in the SIA are of cultural significance to the Mountain Maidu, being the center of the universe in their creation myth. · Maintain cultural values of the Homer / Deer Special Interest Area.	250-7l: None of the alternatives analyzed in detail in the RDEIS would designate the Homer/Deer SIA for OSV use.
Engineering / Transportation	247-18: Comment asserts the EIS fails to adequately recognize and address RS2477 route standing. The proposed action closes and obliterates many routes that have RS2477 standing and should be perpetuated for public motorized access and use as originally allowed by the law.	247-18: There are no pending RS2477 claims on the Lassen National Forest. It is the agency's policy to resolve RS2477 claims as they are brought forward.
Fisheries	226-7b: Comment asserts the analysis assumes Cascade frog is present in Colby Creek, but comment states this species has not been found there in several years and that this area is already off-limits to OSV travel, so over-snow travel isn't a factor.	226-7b: Thank you for your comment. The potential impacts of the alternatives on cascade frog (a sensitive species) are disclosed in chapter 3 (page 634) of the RDEIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Fisheries	226-7a: Comment asserts any adverse impacts to Sierra Nevada yellow-legged frog are mitigated to the greatest extent possible by prohibiting travel across non-frozen streams and lakes and is no change from existing management.	226-7a: Thank you for your comment. The potential impacts of the alternatives on Sierra Nevada yellow-legged frog are disclosed in chapter 3 of the RDEIS on page 633.
Hydrology	250-7f: Bogard OSV Area: The OSV trails are concentrated in the eastern portion of the unit and provide access to the Crater Lake Special Interest Area. · To maintain water quality of Crater Lake. Prohibit off road OSV use in the SIA. Restrict OSVs to roads in this area.	250-7f: All alternatives analyzed in detail in the RDEIS would designate the Crater Lake SIA for OSV use. However, proposed OSV designations in the Crater Lake SIA would not result in any long-term effects that would be detrimental to the features in the area. Although OSV use would be designated in some Special Interest Areas, we would manage these areas to "protect and preserve the values of each special area as identified in an establishment report or area management plan, in conformance with the Special Areas Prescription and Management Area direction," as required by the forest plan. These areas are also managed according to the designated Recreation Opportunity Spectrum classes in which they are located (forest plan page 4-68).
Hydrology	250-7g: Bogard OSV Area: The Eagle Lake Tour is an easy 10-mile round trip ski adventure on the south shore of Eagle Lake. · To maintain water quality of Eagle Lake. Prohibit OSV use along the shores of Eagle Lake.	250-7g: Alternative 5 addresses the concern expressed in the comment (RDEIS, page 49).
Hydrology	165-1: Comment opposes a minimum snow depth requirement because 6" of soft snow in winter is very different than 6" of hard packed snow in spring. If there's not enough snow, OSV enthusiasts aren't going to ride for multiple reasons including not damaging the environment and also not damaging our sleds.	165-1: The EIS analyzes an alternative in detail (alternative 4, RDEIS, page 44) in which a minimum specified snow depth does not determine whether OSV use might be allowed to occur. Instead, the alternative requires sufficient snow to avoid underlying resource damage.

Resource	Sample Comment Number, and Public Concern	Agency Response
Hydrology	235-5a: 1. 12" snow depth minimum on OSV-designated areas. Is there any scientific data supporting this particular standard? Is snow density addressed? Would it be better to make the snow depth criteria based on actual conditions, or an arbitrary standard? 2. 3,500' elevation standard for OSV use. Should actual snow conditions dictate OSV use, or an arbitrary standard elevation? 3. December 26 - March 31 closure for wheeled vehicles. I understand the start date for wheeled closures accommodates Christmas tree cutters. Should actual snow depth and conditions dictate the opening and closing season for wheeled vehicles, rather than an arbitrary date(s)? 4. Resource Damage: What is the definition of "Resource Damage" on the LNF? It appears vague and not specific. Perhaps kiosk signs and brochures defining actual resource damage criteria would educate and inform the diverse users of the LNF. 5. Pacific Crest Trail buffer and crossings: How to install signage and enforce? The PCT is not currently labeled on the 2005 LNF Winter Recreation Guide. 6. Winter Advisory Council: Perhaps a group of diverse winter users on the LNF could collect data and share with the LNF to address some of the above stated concerns. Perhaps OHV funds could support a Winter Advisory Council. 7. User conflict issues are nearly non-existent on the LNF.	235-5a: 1. The concern expressed in the comment is addressed on page 99 of the RDEIS. Also see the response to comment 257-8. 2. The Forest Service is analyzing five alternatives for their potential effects, including three that designate areas or trails for OSV use below 3,500 feet. This analysis will serve to inform the decision. 3. None of the alternatives would set a start or end date for when OSV use would be allowed to occur on the forest. OSV use would be allowed in the areas and trails designated for OSV use whenever snow conditions allow it. 4. Thank you for your comment. The Forest Service will provide a definition of resource damage with publication of the Revised FEIS. 5. The Pacific Crest National Scenic Trail will be shown on the Over-Snow Vehicle Use map that is produced by this planning effort. It will be mapped for reference, only, and will not be designated for OSV use. All designated trails across the Pacific Crest National Scenic Trail in alternatives 2 and 5 occur over National Forest System roads and should be readily identifiable under most conditions, either visually or through GPS tracking. All designated OSV trails that would cross the PCT are currently on roads identified on the current Forest winter recreation map and would be identified in any subsequent OSV map developed. However, the Forest Service recognizes that, under some extreme snowfall conditions, it may be impossible to accurately identify designated trails across the PCT. 6. The Forest Service will work with multiple interest groups to find common ground and enhance the implementation of the decision. 7. As pointed out in the RDEIS in numerous locations, the Forest Service has limited or no reports of use conflicts or resource damage in almost three decades of monitoring OSV and non-motorized use during the winter.

Resource	Sample Comment Number, and Public Concern	Agency Response
Hydrology	247-29b: Comment asserts there is no research or science provided to support a 12" snow depth requirement. Furthermore, all bald ridge tops will never have more than 2"-3" of snow due to high winds.	247-29b: The concern expressed in the comment is addressed on page 99 of the RDEIS. The comment is correct that published, peer-reviewed data evaluating the best minimum snow depth for resource protection is not available. In multiple reviews of credible scientific data, specialists have determined there is little or no peer reviewed scientific study to support a universal snow depth for protection of multiple resources. Specialists believe this is due to differences in the snow depth to protect different resources, the variable nature of snowpack primarily based on moisture content, and differences in snowpack that occur regionally and nationally. However, U.S. Forest Service staff at the forest and district level have decades of experience managing for OSV use. OSV managers, groomers, and other specialists with field knowledge of OSV use have observed timing of OSV use, weather and snowpack patterns, and resource conditions throughout the winter season and during the summer season to develop their empirical understanding of appropriate measures needed for OSV management and for resource protection. Generally, our staff agrees, in the Sierra Nevada range, that 12 inches of snow provides adequate protection for resources in areas designated for OSV use. The comment is also correct in pointing out that the Programmatic Agreement with SHPO specifies 12 inches of snow for adequate protection of heritage resources. This reflects the general consensus that available knowledge and observations of snow depths suggests 12 inches as a minimum needed for protection. Similarly, California State grooming standards require a minimum of 12 inches of snow prior to conducting grooming operations in order to protect equipment. The broad consensus of managers with direct knowledge of on-the-ground conditions is that 12 inches of snow is a minimum standard for the protection of resources in absence of empirical evidence to the contrary.

Resource	Sample Comment Number, and Public Concern	Agency Response
Hydrology	257-8: Comment asserts that the Forest Service does not have any scientific evidence to support a 12-inch minimum snow depth for OSV use.	257-8: The concern expressed in the comment is addressed on page 99 of the RDEIS. The comment is correct that published, peer-reviewed data evaluating the best minimum snow depth for resource protection is not available. In multiple reviews of credible scientific data, specialists have determined there is little or no peer reviewed scientific study to support a universal snow depth for protection of multiple resources. Specialists believe this is due to differences in the snow depth to protect different resources, the variable nature of snowpack primarily based on moisture content, and differences in snowpack that occur regionally and nationally. However, U.S. Forest Service staff at the forest and district level have decades of experience managing for OSV use. OSV managers, groomers, and other specialists with field knowledge of OSV use have observed timing of OSV use, weather and snowpack patterns, and resource conditions throughout the winter season and during the summer season to develop their empirical understanding of appropriate measures needed for OSV management and for resource protection. Generally, our staff agrees, in the Sierra Nevada range, that 12 inches of snow provides adequate protection for resources in areas designated for OSV use. The comment is also correct in pointing out that the Programmatic Agreement with SHPO specifies 12 inches of snow for adequate protection of heritage resources. This reflects the general consensus that available knowledge and observations of snow depths suggests 12 inches as a minimum needed for protection. Similarly, California State grooming standards require a minimum of 12 inches of snow prior to conducting grooming operations in order to protect equipment. The broad consensus of managers with direct knowledge of on-the-ground conditions is that 12 inches of snow is a minimum standard for the protection of resources in absence of empirical evidence to the contrary.
NEPA	623-5: Comment raises concern over a proposed PCT buffer in some of the alternatives. Comment further raises the concern that changing the proposed action to add a PCT buffer is a NEPA violation.	623-5: The changes to the proposed action from the time of scoping to the release of the RDEIS are documented in the RDEIS (pages 23 to 26, "Development and Modification of Alternatives.") "*'The responsible official may modify the proposed action and alternative(s) under consideration prior to issuing a draft EIS. In such cases, the responsible official may consider the incremental changes as alternatives considered. The documentation of these incremental changes to a proposed action or alternatives shall be included or incorporated by reference in accord with 40 CFR 1502.21.'* (36 CFR 220.5(e)) This encourages collaboration throughout the analysis and decision-making process. Ongoing collaboration may often result in modification of a proposed action or alternative(s), resulting in a better proposal and ultimately a better decision. Such changes may not necessarily require the development of a new alternative if they can be accommodated through modification of an existing alternative" FSH 1909.15, Section 14.

Resource	Sample Comment Number, and Public Concern	Agency Response
NEPA	624-7: Comment is concerned that not all projects on the Forest are identified and analyzed for cumulative effects. Comment further states that: "It is important that all existing IRAs (Inventory Roadless Areas), RNAs (Research natural Areas), SIAs (special interest areas), semi-primitive roadless areas and any areas that are under consideration for potential roadless areas be excluded from all future OSV use. All of these areas are considered "unique, special, one-of-a-kind, exceptional, distinctive, and rare" parts of the LNF. It is important to protect these areas from motorized vehicle use; at least until the upcoming forest plan revision is complete. Are we willing to justify OSV use in these areas with the potential risks"?	624-7: Ongoing or proposed projects that would be relevant and useful for consideration in the cumulative effects analysis will be re-evaluated for the Revised FEIS, given that some projects have changed status since the RDEIS was finalized for public comment. The forest plan prohibits motorized use in Research Natural Areas (forest plan page 4-68) No RNAs would be designated for OSV use under any alternative analyzed in the RDEIS. Although OSV use would be designated in some Special Interest Areas, we would manage these areas to "protect and preserve the values of each special area as identified in an establishment report or area management plan, in conformance with the Special Areas Prescription and Management Area direction," as required by the forest plan. These areas are also managed according to the designated Recreation Opportunity Spectrum classes in which they are located (forest plan page 4-68). However, proposed OSV designations in Inventoried Roadless Areas and in areas with Wilderness values would not result in any long-term detrimental effects to their existing roadless or Wilderness values that would preclude their consideration as wilderness in the future. OSV use is allowed in IRAs, subject to other restrictions that might exist in forest plan direction. Portions or all of some IRAs would not be designated, but the reason would be to address the minimization criteria, not simply because these areas are IRAs. We considered all IRAs and potential roadless areas and in those that we designated, we found no potential use conflict or resource issues in these areas that would preclude their designation for OSV use.
NEPA	629-75: Comment asserts that the Lassen should use the best available science when making its decision.	629-75. The Forest's staff makes every effort to locate and use credible science for all planning decisions. All literature cited in the document may be found in the Literature Cited section of the RDEIS or in the Project Record.
NEPA	132-1: I hope I have heard something wrong, but the last I had heard you were going with alternative 4 for the OSV plan. Minimal changes. BUT, I heard rumor today that you have rescinded that option and are now going with alternative 5.	132-1: No alternative has yet been selected and no decision has been made.
NEPA	629-6: Comment requests that the decision be based on the best available science.	629-6: The decision will be based on the most credible science.

Resource	Sample Comment Number, and Public Concern	Agency Response
NEPA	582-6b: Comment states that there is no reference anywhere in the RDEIS to qualitative reasons why any of the areas closed to motorized use in the FEIS should now be opened to motorized use in the RDEIS.	582-6b: In the FEIS (page 87), alternative 2 (Modified Proposed Action) would have designated 921,130 acres for OSV use. In the RDEIS (page 58), alternative 2 (Modified Proposed Action) would designate 921,180 acres for OSV use on the Lassen National Forest. This 50-acre increase in designated OSV area is due to several factors which include incongruent data layers in the geographic information system data that were not recognized in the FEIS, but were recognized in the RDEIS. Another factor that increased the number of acres designated for OSV use under alternative 2 was the designation of certain areas below the elevation of 3,500 feet for OSV use that had not been designated in that alternative in the FEIS (RDEIS, page 26).
Recreation	125-1: I am opposed to any restrictions that Lassen National Forest is trying to impose on our riding areas. I oppose any changes to the current Lassen National Forest OSV management plan. We are users of the Forest in a manner which utilizes OSV travel and oppose any such change that would dis-allow us to do this. There is currently no reason to change the existing OSV travel rules and designations other than to eliminate snowmobiling in its truest form of boondocking. It does not harm wildlife or the environment in any way of which the oppositions proposes. They are guilty of making up science to suit their needs. To inhibit or remove off-trail riding of OSVs will destroy the true nature of "mountain" or "boondock" riding as we know it today.	125-1: Thank you for your comment. One of the significant issues in this EIS is the potential effect the decision would have on the availability of motorized over-snow recreation opportunities (RDEIS, page 17).
Recreation	153-1: Comment asserts that since snowmobiles are over the snow, they leave no marks on the terrain and landscape. Comment further asserts that human foot traffic in the summer leaves more impacts on the ground. Why not regulate hiking because it causes more damage?	153-1: Thank you for your comment. The purpose of this analysis is to designate areas and trails for over-snow vehicle use as required by the travel management regulations at 36 CFR Part 212, Subpart C. Neither the executive orders nor the travel management regulations which implement them are intended to regulate non-motorized use (RDEIS, page 3).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	154-2: No one appreciates and respects wildlife more than us motorized and non-motorized backcountry enthusiasts. It is my intention to be able to provide access for my children, nieces and nephews for generations to come. Other organizations using false claims about wildlife, pollution, or impacts of animals is simply untrue. Organizations like Winter Wildlands Alliance or WildEarth Guardians employs their own scientists, lawyers and many other high level officials to employ false tactics to feed their bottom line. If organizations like this stated above, us power sports enthusiasts wouldn't have anywhere to ride. Who are they to say where we can or can't ride? How is their cause anymore justified than our legal right to ride snowmobiles in legal designated public land areas.	154-2: Thank you for your comment. The National Environmental Policy Act requires all federal agencies to "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on the environment" (42 U.S.C. 4331, Sec. 102). Using that approach in our analyses, we do not give preference to the opinions of those on any one side of an issue based only on their interests.
Recreation	182-3: Comment opposes new OSV management plan and states we have no information that provides evidence that OSV use negatively affects forest resources.	182-3: OSVs have been operated in the Lassen National Forest on existing identified OSV trails and in existing identified OSV areas for decades with no record of impacts to forest resources or use conflicts specifically attributed to OSV use. In the last five years, approximately 100 cultural resource sites have been impacted by OHV use. Some if these impacts may be from OSV use, but our monitoring does not differentiate between OHV and OSV impacts. We completed an Environmental Assessment of OSV use on the Lassen National Forest in 1989. That Environmental Assessment identified areas of potential adverse impacts to natural and cultural resources, and we did not establish OSV trails in the areas where these resources would be adversely affected. Furthermore, we know other forests have recorded resource damage and use conflicts and we have law enforcement reports of inadvertent OSV incursions into areas where OSV use is not designated and would not be designated for OSV use in this decision, such as Wilderness. For the current designation process, utilizing minimization criteria, we identified some areas where potential adverse impacts or use conflicts might be possible and minimized those effects where they have the potential to occur.
Recreation	187-8: Comment asserts that the USFS is supposed to operate these forests as "public lands." Comment requests that the Forest Service should not let the views of a minority group of people adversely affect how OSV enthusiasts enjoy themselves on the forest. There is plenty of room to allow everyone to enjoy our forests simultaneously and to its full potential.	187-8: Thank you for your comment. The decision will be based on evidence gathered in analysis. We would not give deference to the opinions of those on any one side of an issue based only on their interests.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	208-14: Finally, could you tell me how much Taxpayer money has been spent by the Forest Service on the entire travel management program?	208-14: The travel management program was first created by an Executive Order 11644 signed by President Nixon in 1972. The National Forest road system is roughly 383,000 miles and 8 times the size of the federal highway system. In addition, 159,000 miles of National Forest Trails exist across the America's National Forests. The National Forest Transportation System provides access to and within National Forest Lands while protecting surrounding resources. Many roads and trails are operated and maintained through partnership. The 2016 road budget for the entire National Forest road system was $172,000,000. The 2016 contract authority alone for the Federal Highway Administration was $50,000,000,000 as a comparison.
Recreation	247-25: Comment asserts that user conflict is not a problem and there is no documentation to support this allegation.	247-25: We understand that documented use conflict is minimal. However, in designating National Forest System trails and areas on National Forest System lands for OSV use, the Travel Management Regulations require us to consider effects on the following, with the objective of minimizing: 1) Damage to soil, watershed, vegetation, and other forest resources; 2) Harassment of wildlife and significant disruption of wildlife habitats; 3) Conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands (RDEIS, page 5). The Forest Service, with input from the public, has developed alternatives that are consistent with and achieve the purposes of the Forest Service Travel Management Regulations at 36 CFR part 212, Subpart C. These include minimizing impacts to natural and cultural resources as well as minimizing use conflicts.
Recreation	250-13: Comment requests development of a Winter Recreation Management Plan that identifies areas where conflict may exist between winter recreation uses and TES Species and outline a strategy to educate the public about these TES Species.	250-13: The Lassen National Forest Over-snow Vehicle Use Designation is not intended to be a comprehensive and holistic winter recreation planning effort. The designations resulting from this analysis would only apply to trails and areas for the public use of OSVs on NFS lands within the Lassen National Forest (RDEIS, page 3). Analysis of TES species on the Lassen National Forest, and potential conflicts with winter use is included in the Wildlife section of the RDEIS (page 428).
Recreation	251-7: Includes copy of Sept. 2017 9th Circuit Opinion in "Wilderness (WILD WILDERNESS; WINTER WILDLANDS ALLIANCE; BEND BACKCOUNTRY ALLIANCE) v. Allen" (No. 14-35505). Affirmed District Court decision that upheld a FS decision to construct a parking lot primarily designed for motorized recreationalists.	251-7: Thank you for sending the court's opinion. A decision to construct a parking lot for motorized recreationalists on the Lassen National Forest could be upheld but it is not within the scope of this analysis. This analysis is not to inform the decision on where parking lots should be located, or if they should exist. If, in the future, we determine the need to change the amount of parking for recreational enthusiasts, and funding is available to implement a change, we would conduct a separate environmental analysis to disclose the potential effects.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	4-1: Why should snowmobilers be discriminated against?	4-1: Reasonable restrictions on motor vehicle use, applied consistently to everyone, are not discriminatory (70 Federal Register 216, page 68285, November 9, 2005).
Recreation	452-1: Comment disputes the need to change the existing management of OSV use on the Lassen National Forest.	452-1: The travel management regulations require the Forest Service to designate roads, trails, and areas for OSV use. The EIS analyzes multiple alternatives with varying levels of areas and trails designated for OSV use.
Recreation	623-4c: Comment states that any new designated skiing areas must also have a snow depth analysis to meet the objectives of the Travel Management Plan.	623-4c: The purpose of this analysis is to designate areas and trails for over-snow vehicle use as required by the travel management regulations at 36 CFR Part 212, Subpart C. Neither the executive orders nor the travel management regulations which implement them are intended to regulate non-motorized use (RDEIS, page 3).
Recreation	629-36, 629-39: Comment requests that the decision include regulation of fat-tired bicycles and wheeled conversion vehicles.	629-36, 629-39: The purpose of this analysis is to designate areas and trails for over-snow vehicle use as required by the travel management regulations at 36 CFR Part 212, Subpart C. Neither the executive orders nor the travel management regulations which implement them are intended to regulate non-motorized use. The vehicles that this analysis and decision are intended to regulate are OSV vehicles, defined in the travel management regulations as, "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" (RDEIS, page 3).
Recreation	629-7: Comment is concerned that "even litigation addressing issues or uses not directly related to OSV travel will result in closures or loss of opportunity for the OSV users".	629-7: Thank you for your comment. We are unaware of the litigation to which the comment refers.
Recreation	C/R #2 (General Support of OSV Use): Comment opposes any further regulations, closures, restrictions etc. being imposed on snowmobilers. Comment asserts they have the same rights as anyone else using public lands for winter recreation, snowmobiles are a great way to recreate in winter and they cause little or no damage. Comment also asserts that areas they use are not used in any significant manner by other groups in winter and that the environmental groups want to take away Comment's lands that are designed for multiple use. Comment closes by stating snowmobiling doesn't have anywhere near the impact on the environment as the one side is trying to say it does.	C/R #2 (General Support of OSV Use): Thank you for your comment. The potential direct, indirect, and cumulative impacts of OSV use that would occur in each alternative are disclosed in the EIS (RDEIS, Chapter 3). National Forests belong to all Americans, but Americans do not have a right to unrestricted use of National Forests. Congress established the Forest Service to provide reasonable regulation of the National Forests so that future generations can continue to enjoy them.
Recreation	C/R #33 (General Dispute of Use Conflicts): Comment asserts that use conflicts between OSV and non-motorized enthusiasts is either non-existent or rare exceptions. Any exceptions can have "loud voices and angry motives."	C/R #33 (General Dispute of Use Conflicts): Thank you for your comment. We recognize this assertion in the recreation analysis and acknowledge use conflicts are rare (RDEIS, page 123).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	C/R #41: The comment suggests the forest is not bound by the Settlement Agreement to amend or revise land and resource management plans so that they would prohibit OSV use in certain areas, and should not close additional public lands to motorized use.	C/R #41: We agree that the Forest Service is not bound by the settlement agreement to revise the forest plan to prohibit OSV use in certain areas. However, the Forest Service is analyzing five alternatives to determine how best to meet the requirements of the Travel Management Regulation and manage for sustained multiple use and resource protection. Under current management, 84 percent of the forest is open to OSV use. The alternatives analyze for designating as much as 83 percent of the forest for OSV use to as little as 55 percent (RDEIS, Table 10). Under all alternatives, more than half of the forest would still be designated for OSV recreation.
Recreation	C/R #77 (General Regulatory Concern): Comment expresses concern that fat-tire bicycles and grooming would be more likely to kill a yellow-legged frog or Yosemite toad than OSV use, and therefore fat-tire bicycles should also be regulated in this decision.	C/R #77 (General Regulatory Concern): Thank you for your comment. None of the alternatives are expected to have an adverse effect on Sierra Nevada yellow-legged frog (RDEIS, page 633). Effects to Yosemite toad are not considered in the analysis because this species simply does not exist in the project area. The purpose of this analysis is to designate areas and trails for over-snow vehicle use as required by the travel management regulations at 36 CFR Part 212, Subpart C. Neither the executive orders nor the travel management regulations which implement them are intended to regulate non-motorized use or motorized fat-tire bicycles because they are not "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, RDEIS, page 3).
Recreation	C/R #9 (General Scope of Project): Comment asserts that management approaches for minimizing conflicts between motorized and non-motorized recreation should not be rejected for being out of scope of the project. Comment states non-motorized trailheads, measures to minimize noise and emissions, encouragement of best-available technology, Nordic trail grooming, and snow play areas should be considered as part of this project in order to ensure balanced recreation opportunities across the LNF and to minimizing conflict between uses.	C/R #9 (General Scope of Project): The Lassen National Forest Over-snow Vehicle Use Designation is not intended to be a comprehensive and holistic winter recreation planning effort. The designations resulting from this analysis would only apply to trails and areas for the public use of OSVs on NFS lands within the Lassen National Forest (RDEIS, page 3). National Forests are managed by law for multiple use. They are managed not only for the purposes stated in these comments, but for timber, grazing, mining, and outdoor recreation. These uses must be balanced, rather than one given preference over another. "Noise is a particularly important issue affecting OHV use nationally. The Forest Service anticipates developing a national standard for OHV noise levels in a future rulemaking" (70 FR 216, page 68271, November 9, 2005).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	C/R #79 (General Concern on Economic Analysis): The cost/benefit analysis should be used to manage the Pacific Crest National Scenic Trail.	C/R #79 (General Concern on Economic Analysis): Thank you for your comment. The Lassen National Forest Over-snow Vehicle Use Designation EIS considers a range of alternatives in terms of designated OSV trails across the Pacific Crest National Scenic Trail. Federal agency cost-benefit analysis need not convert all costs and benefits to monetary terms. The Lassen National Forest Over-snow Vehicle Use Designation EIS evaluates costs and benefits associated with the range of management alternatives. Costs and benefits considered include recreational access, diverse recreation opportunities, use conflict, and ecological integrity. Costs and benefits are described in both quantitative and qualitative terms throughout the environmental consequences analysis in the EIS. Visitation to the Pacific Crest National Scenic Trail is considerably higher than noted in the comment. According to the Pacific Crest Trail Association, in 2016 5,657 permits were issued to long-distance trail hikers (those traveling at least 500 miles in a single trip). Surveys have not been conducted to estimate total annual use of the trail, though it is reasonably expected to be substantially greater than the number of long-distance hikers.
Recreation	629-50: Comment states that Congress amended the National Trails System Act (which provided for the Pacific Crest National Scenic Trail) in 1984 to prohibit managing areas adjacent to National Trails for the benefit of the trail and that not designating land adjacent to the PCT for OSV use violates this amendment.	629-50: Alternatives 3 and 4 designate areas adjacent to the Pacific Crest Trail for OSV use and are analyzed in depth.
Recreation	629-49: Comment asserts that the Comprehensive Plan for the Pacific Crest Trail fails to recognize the Federal Lands Policy and Management Act of 1976 and states that the land along the Pacific Crest Trail must be managed for multiple use.	629-49: National Forest System lands are to be managed for multiple use as required by the Multiple Use Sustained Yield Act and the National Forest Management Act. However, neither of these acts require all of the multiple uses to occur on every acre of the National Forest System. Not every possible use on the list of multiple uses is intended to occur on every acre of the National Forest System at the same time.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	629-51: Comment asserts that a non-motorized corridor along the Pacific Crest Trail is inconsistent with the 1984 amendments to the National Trails System Act. Furthermore, the amendments allow motor vehicles on certain trails and, therefore, OSVs should be allowed on the Pacific Crest Trail.	629-51: The area “not designated” for OSV use immediately adjacent to the Pacific Crest Trail addresses the 2005 Travel Management Regulation's minimization criteria requirements for travel. Since this is a travel management planning process, there is no additional land management direction associated with it. Future forest planning efforts would comply with FSH 1909.12 and would provide for the nature and purposes of the trail by also considering access, cultural and historic resources, recreational settings, scenic character, and valid existing rights. See 629-50. Sec 7(c) of the National Trails System Act prohibits motorized use along national scenic trails. This is codified in 36 CFR§ 261.20 Pacific Crest National Scenic Trail; [49 FR 25450, June 21, 1984. Re-designated at 70 FR 68291, Nov. 9, 2005]). To comply with this law and regulation, all action alternatives identify the Pacific Crest National Scenic Trail as not-designated for OSV use. The National Trails System Act in Sec.7(j) applies to the entire national trails system composed of national recreation, scenic, and historic trails. The Act outlines a list of motorized and non-motorized potential uses that may be allowed. While motorized use may be allowed on national recreation and national historic trails, it does not override the prohibition found in Section 7(c) on national scenic trails.
Recreation	629-53: Comment sees management conflict between forest and regional approaches to managing the PCT under NTSA.	629-53: The forest's staff is working closely with Regional Office staff to address issues surrounding the Pacific Crest National Scenic Trail that are consistent with laws, regulation and policy.
Recreation	250-7z: Shasta OSV Area: The area has outstanding opportunities for non-motorized winter recreation. · To maintain non-motorized winter recreation opportunities, retain the SPNM Areas in the revised Lassen Land & Resource Management Plan.	250-7z: Under alternative 5 the Shasta OSV area would not be designated for OSV use. Therefore, no SPNM areas would be designated in the Shasta OSV area under alternative 5. We inadvertently designated some SPNM areas for OSV use in the Shasta OSV area under the modified proposed action. Thank you for identifying that error. We will correct the designation of these SPNM areas in the Revised FEIS and the correction will be reflected in all alternatives. None of the alternatives would designate SPNM areas for OSV use.
Recreation	1-3, 14-3: Comment believes the designation of OSV areas on the Lassen would be in violation of the travel regulations because the designated areas would be adjacent to each other.	1-3, 14-3: The travel regulations at 36 CFR § 212.1 define an area as "A discrete, specifically delineated space that is smaller, and, except for over-snow vehicle use, in most cases much smaller, than a Ranger District." The areas to be designated are smaller than a ranger district on the Lassen National Forest and not adjacent to each other. All areas to be designated for OSV use are separated from each other either by highways where OSV use would not be designated or by land that would not be designated for OSV use. See figure 4 in the EIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	247-12, 247-15: Comment expresses the concern that the agency is applying wilderness standards to lands designated for multiple-use and the alternatives effectively convert multiple-use lands to de facto wilderness lands which circumvents congressional law and the wilderness designation process.	247-12, 247-15: There are no alternatives in which the Forest Service is proposing additional Wilderness, de-facto or otherwise. The Forest Service, with input from the public, has developed alternatives that are consistent with and achieve the purposes of the Forest Service Travel Management Regulations at 36 CFR part 212, Subpart C.
Recreation	247-31a: Comment asserts that the Forest Service must revise the Lassen LRMP to help differentiate LMP Management Areas from OSV Management Areas, and their associated issues.	247-31a: The Forest Service is not required to amend its land management plan to manage OSV use on the forest. "A plan's identification of certain lands as suitable for a use [such as OSV use] is not a commitment to allow such use but only an indication that the use might be appropriate. A specific use or activity may be approved or may be disapproved in an area identified as suitable for such types of use" (Forest Service Handbook 1909.12, section 22.15). For instance, a plan may identify a management area as suitable for OSV use; however, that suitability determination does not imply that this use must always be allowed.
Recreation	250-4a: Comment asserts that although the designated OSV Use Areas smaller than Ranger Districts, they believe the boundaries are arbitrary.	250-4a: The travel regulations at 36 CFR § 212.1 define an area as "A discrete, specifically delineated space that is smaller, and, except for over-snow vehicle use, in most cases much smaller, than a Ranger District." The areas to be designated are smaller than a ranger district on the Lassen National Forest and not adjacent to each other. All areas to be designated for OSV use are separated from each other either by highways where OSV use would not be designated or by land that is not designated for OSV use. See figure 4 in the RDEIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	254-4: Comment takes issue with the designation of smaller, contiguous areas and suggests the Forest has not correctly interpreted the Travel Rule in developing discrete areas. Comment suggests that designated OSV boundaries "should, wherever possible, follow clear topographical or physical features such as ridgelines, rivers, and roads".	254-4: The travel regulations at 36 CFR § 212.1 define an area as "A discrete, specifically delineated space that is smaller, and, except for over-snow vehicle use, in most cases much smaller, than a Ranger District." The areas to be designated are smaller than a ranger district on the Lassen National Forest and not adjacent to each other. All areas to be designated for OSV use are separated from each other either by highways where OSV use would not be designated or by land that is not designated for OSV use. See figure 4 in the EIS. The areas developed under alternative 5 meet this definition and were developed to take advantage of existing administrative boundaries, major roads and highways and other features that could be readily identified on the ground. As pointed out in the RDEIS in numerous locations, the Forest Service has limited or no reports of use conflicts or resource damage in almost three decades of monitoring OSV and non-motorized use during the winter. Areas of particular concern for specific resources are already identified as not designated for OSV use. Rather than arbitrarily defining small areas of designated OSV use, the Forest Service has sought to limit the areas not designated for OSV use or areas where OSV use would be restricted to trails to those areas where issues have been identified.
Recreation	257-9: Comment asserts that bulldozers and cross-country skiers exert more pressure per square inch on the ground than a snowmobile and therefore, these uses should be more strictly regulated than snowmobiles.	257-9: The purpose of this analysis is to designate areas and trails for over-snow vehicle use as required by the travel management regulations at 36 CFR Part 212, Subpart C. Neither the executive orders nor the travel management regulations which implement them are intended to regulate non-motorized use. The vehicles that this analysis and decision are intended to regulate are over-snow vehicles, defined in the travel management regulations as, "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" (RDEIS, page 3). A bulldozer fits this definition because it runs on tracks and can be used over snow. However, any activity that a bulldozer typically would be engaged in would be subject to its own analysis and decision as required by NEPA.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	629-5: Comment states a position based on the recently filed legal challenge to the issuance of OSVUM on the Payette, Bridger-Teton and Payette NF in Idaho by WWA, where the OSVUMs were based on existing planning on these forest for OSV usage.	629-5: Thank you for your comment.
Recreation	C/R #25 (General Comments on Designated Areas): Comments dispute the size of designated OSV areas as inconsistent with the travel management regulations.	C/R #25 (General Comments on Designated Areas): The travel regulations at 36 CFR § 212.1 define an area as "A discrete, specifically delineated space that is smaller, and, except for over-snow vehicle use, in most cases much smaller, than a Ranger District." The areas to be designated are smaller than a ranger district on the Lassen National Forest and are not adjacent to each other. All areas to be designated for OSV use are separated from each other either by highways where OSV use would not be designated or by land that is not designated for OSV use. See figure 4 in the EIS.
Recreation	247-31b: Comment asserts the Forest Service has done no coordination with adjacent forests to provide forest users with a seamless transition between forests (i.e., Riding from the LNF to PNF in the Fredonyer area).	247-31b: The Forest Service has discussed OSV issues with other agency staff in the region to provide consistency along the borders as well as made the proposal available to regional and other forest staffs for review and comment. Adjacent forests under the settlement agreement have not yet completed their proposed action. We are currently unaware of any specific issues that would affect continuity of a recreation experience across forest boundaries.
Recreation	257-1: Comment asserts that the Forest did not follow requirements for coordination with local county governments.	257-1: The comment does not elaborate on what specific regulation the Forest Service failed to meet for coordination. The RDEIS describes the Forest Service's coordination efforts with the local counties (See the "Public Involvement" section of the RDEIS, page 15). In a January 27, 2012 letter from Department of Agriculture Secretary Thomas Vilsack to Congressman Wally Herger, the Secretary clearly identifies the regulations and department expectations regarding coordination: · "The Department of Agriculture's Forest Service's primary responsibilities to coordinate with counties are found in the National Forest Management Act (NFMA) and the National Environmental Policy Act (NEPA). Although some provisions in the Federal Land Policy and Management Act (FLPMA) apply to National Forest System lands, none require the Forest Service to coordinate with counties. The coordination requirement in FLPMA (43 U.S.C. 1721(c)(9)) applies to the Secretary of the Interior, not the Forest Service.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	257-1: Comment asserts that the Forest did not follow requirements for coordination with local county governments. (continued)	· Under NFMA and its implementing regulations, the Forest Service is required to coordinate land management planning for the National Forest System (the amendment and revision of forest plans) with land management planning conducted by State and local governments. This coordination allows the Forest Service to take into account and consider the State or county's proposed management for lands under their jurisdiction, and vice-versa. · Based on recent local government resolutions, including those attached to your letter, and letters to some of our National Forests, it appears that some local government officials believe that the NFMA coordination requirement means that the Forest Service must incorporate specific provisions of county ordinances into forest plans or that the Forest Service must obtain local government approval before making planning decisions. This position overstates the Forest Service's NFMA obligation. The statute does not specify which actions are required to coordinate Forest Service planning with local government planning and does not in any way subordinate Federal authority to counties. Rather, the Forest Service must consider the objectives of the State and local governments and Indian Tribes as expressed in their plans and policies, assess the interrelated impacts of these plans and policies, and determine how the forest plan should deal with the impacts identified". · Throughout the OSV EIS process, beginning in 2014, the Forest Service has continually reached out to local governments, in addition to other governmental entities and members of the public, to inform them of each stage of this process and to elicit input. This has occurred through a variety of publicly held meetings, requests for input during times when documents have been made available for comment, and through informal conversations. Local governments have provided numerous comments that have been, and will be, taken into consideration by the Forest Service.
Recreation	C/R #30 (General Concern with Local Government Coordination): Comment asserts that the Forest Service did not coordinate with local governments as required by the travel management regulations.	C/R #30 (General Concern with Local Government Coordination): The RDEIS describes the Forest Service's coordination efforts with the local counties (See the "Public Involvement" section of the RDEIS, page 15).
Recreation	623-3: Comment informs the Forest of the results of a meeting with motorized and non-motorized users.	623-3: Thank you for your comment. The Forest Service appreciates that multiple interest groups are working together to find common ground and looks forward to any proposals that might be used to inform the decision.
Recreation	C/R #22 (General Support for Agency's Public Involvement Efforts): Comment commends the Forest Service's efforts to revise its environmental analysis to address public concerns.	C/R #22 (General Support for Agency's Public Involvement Efforts): Thank you for your comment.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	226-8: Comment states that OSV enthusiasts use private parking lots on the Almanor Lakeshore to park their vehicles and trailers while recreating in the Jonesville area across Highway 89. Comment is concerned that no alternative allows OSV access from the private parking areas on the Almanor Lakeshore to the trailheads accessing the Jonesville OSV area across Highway 89.	226-8: Thank you for your comment. We have modified alternative 4 so we can consider designating the area along Lake Almanor for OSV use to facilitate OSV enthusiast parking on the east side of Highway 89 along Lake Almanor and access to the OSV areas on the west side of Highway 89.
Recreation	250-7n: Jonesville OSV Area: The Lake Almanor Recreation Trail provides an easy to moderate 19-mile round trip ski along the west shore of Lake Almanor. The trail is closed to all motorized vehicles. Opportunities for remote backcountry skiing exist at Butt Mountain. This Semi-Primitive Non-Motorized Area is located south of Deer Creek and can be accessed via the Pacific Crest Trail. · To maintain high quality motorized winter recreation opportunities. Provide a Designated Ungroomed OSV Trail on public lands in the area west of Lake Almanor to allow access from private homes to the Groomed OSV Trail not under Forest Service Jurisdiction west of Highway 89 (Humboldt Road, Plumas County Road 308).	250-7n: Thank you for your comment. We have modified alternative 4 to designate the area along Lake Almanor for OSV use to facilitate access to the OSV areas on the west side of Highway 89.
Recreation	247-9: Comment expresses concern that there are no alternatives to compensate for lost OSV access for the elderly, handicapped, veterans, and disabled in areas close to towns.	247-9: One of the significant issues being analyzed in the EIS is the potential effect the designations would have on motorized over-snow recreational opportunities on the forest. The potential direct, indirect, and cumulative impacts on this concern are disclosed in chapter 3 of the RDEIS (page 100).
Recreation	165-6: Comment asserts that non-motorized enthusiasts oppose OSVs because they cause avalanches. Comment cites data that shows OSVs didn't cause avalanches in the Sierra Nevada in the 2016-2017 winter season, but all 16 reported avalanches in the Sierra Nevada during that period were triggered by skiers and snowboarders.	165-6: Thank you for your comment.
Recreation	176-1a: Comment asserts that snowmobile accidents resulting in injuries to non-motorized users is unheard of because while the snowmobiler may be traveling at a high rate of speed, the skier/snowshoer/etc. is not, which leaves ample time to react and avoid a collision.	176-1a: The Forest Service does not have a record of significant safety issues arising from combined use of routes by motorized and non-motorized recreational enthusiasts. The Forest Service further educates recreational enthusiasts on being safety conscious through various educational materials including winter recreation maps and postings at trailhead kiosks.
Recreation	176-1b: Comment asserts that snowmobile head-on accidents are few and far between, but the number of incidents are certain to increase as riding land is decreased simply due to the heightened concentration of snowmobilers in a smaller area.	176-1b: Alternatives are being analyzed for possible effects on recreation use and safety and the result of this analysis will inform the decision (RDEIS, page 100).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	C/R #21 (General Opinion in Favor of Solitude): Comment expresses the desire to experience the Lassen NF in peace and quiet, with ample opportunity to ski without the noise and air pollution of snow mobiles.	C/R #21 (General Opinion in Favor of Solitude): Thank you for your comment. The Revised DEIS analyzes the potential effects of each alternative on air quality (RDEIS, page 210) and noise levels (RDEIS, page 177).
Recreation	629-64: Comment asserts that current management of winter recreation on the Lassen has resulted in very low levels of use conflict reported.	629-64: We have noted this in the RDEIS (RDEIS pages 134 and 246).
Recreation	252-2: Comment observes that the RDEIS states, "There are occasional OSV incursions in wilderness and adjacent non-motorized areas (reports of OSV trespass into Caribou Wilderness, Lassen Volcanic National Park, and occasionally on designated cross-country ski trails), but law enforcement has determined many of the incursions to be inadvertent. OSV trespass into designated wilderness facilitated by nearby groomed trails could occur and may increase as use increases. There are no other known conflicts between OSV use and other uses on National Forest System land or neighboring Federal lands, no known conflicts among classes of OSVs, and no known areas where use is adversely affecting cultural, tribal, or historic resources (USDA Forest Service 2014)" (RDEIS, p. 123). The Comment states that the agency's assumption that conflict will continue or likely increase as population and visitor use increase is not substantiated by the facts and is contrary to statements in the RDEIS (See attached exhibits A-1 to A-3). Comment suggests the agency include Lassen NF 2015 NVUM data in the tables on p. 122 of the RDEIS and correct the NVUM errors in Table 22. Consideration of 2015 NVUM data, would show a significant decline in national forest visits since 2000, a decline in OSV participation and a decline in cross-country skiing participation. Population for Lassen, Modoc, and Plumas Counties have also declined since 2000.	252-2: We will reconsider the information brought forward in the comment when completing the Revised FEIS.
Recreation	247-8: Comment expresses concern that there are no alternatives to compensate for lost OSV access for youth in areas close to towns.	247-8: One of the significant issues being analyzed in the EIS is the potential effect the designations would have on motorized over-snow recreational opportunities on the forest. The potential direct, indirect, and cumulative impacts on this concern are disclosed in chapter 3 of the RDEIS (page 100).
Recreation	231-2: Any loss of legal OSV recreating acres will create user conflict that does not currently exist.	231-2: The designations resulting from this analysis would minimize "conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands" (36 CFR 212.55(b)(3).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	226-3f: The Hillsliders groom to the top of Colby Mountain and open this area up to snowmobiling at the top. We do this under our M.O.U. with Lassen National Forest. This groomed trail is not just for recreation. The Hillsliders grooming of this road provides winter access to the communication towers at the top of Colby. These towers are utilized by California Highway Patrol, Butte County Sheriff, Plumas County Sheriff, AT&T, and others. Closing this groomed route would cause hardship for all of the agencies and could be dangerous. (27N06/27N36)	226-3f: We are not proposing closure of the referenced route in any alternative being analyzed in detail.
Recreation	583-12: Comment emphasizes that closure of parts of the area utilized by these winter sports users (Colby Mountain Area managed by the Butte Meadows Hillsliders in partnership with The US Forest Service, Butte County, Plumas County, and Sierra Pacific), as suggested by alternative 5, would cripple the Jonesville Snow Park and the Hillsliders' successful and long-standing grooming and maintenance program.	583-12: Alternatives are being analyzed in detail that do not include a closure of this extent. The results of this analysis will be used to inform the decision.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	629-14, 629-16, 629-18, 629-21, 629-22, 629-23, 629-24, 629-27, 629-29 629-30, 629-32, 629-33, 629-37, 629-38: Comments express concerns about non-typical OSV uses and potential impacts. Concern is expressed that the definition of an OSV is overly narrow and does not include other types of machines that would cause more extensive and deeper disturbance to snow and underlying resources than snow mobiles. These include fat-tired human powered bicycles, fat-tired electric bicycles, OHVs and tractors converted with snow tracks, motorcycles converted with skis and tracks, and OHVs fitted with larger tires to allow use on deep snow. Comment also asserts motorcycles converted with skis attached to the front fork and tracks in place of the rear drive wheel are consistent with the definition of an OSV. However, these vehicles exert far more pressure per square inch on the snow than a snowmobile. Six inches of snow on a trail may be sufficient for a snowmobile, but may not be sufficient to avoid surface resource disturbance for one of these converted motorcycles. Therefore, they should be regulated differently. Comment also asserts fat-tire bicycles exert far more pressure per square inch on the snow than a snowmobile. Six inches of snow on a trail may be sufficient for a snowmobile, but may not be sufficient to avoid surface resource disturbance for a fat-tire bicycle. Therefore, they should be regulated differently. Comment also asserts that wheeled vehicles converted to run on tracks in the snow, and wheeled vehicles converted to run on snow with bigger tires pose different management challenges for land managers. Comments in general offer additional insight into the use and management of these different types of vehicles.	629-14, 629-16, 629-18, 629-21, 629-22, 629-23, 629-24, 629-27, 629-29 629-30, 629-32, 629-33, 629-37, 629-38: The Travel Management Regulations define an over-snow vehicle as 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. A human powered fat-tire bicycle is not consistent with this definition and therefore would not be subject to the designations resulting from this process. Further, the analysis differentiates between different types of over-snow vehicles as long as they meet the definition of an OSV as stated in the regulations at 36 CFR 212.1. If we determine that differentiation is needed, further refinements in the designations resulting from this process will be considered in the future. If new information or changed circumstances relating to the environmental impacts of an action come to the attention of the responsible official after a decision has been made, the responsible official would review the information carefully to determine its importance. Consideration would be given to whether or not the new information or changed circumstances are within the scope and range of effects considered in the original analysis. If a correction, supplement, or revision to the environmental document is necessary, the responsible official will do so.
Recreation	623-12: Comment asserts that mileage for groomed trails should not be based on current funding levels.	623-12: Thank you for your comment. The purpose of this environmental analysis is to designate "a manageable system of snow trails and areas for public OSV use within the Lassen National Forest that is consistent with and achieves the purposes of the Forest Service Travel Management Regulations at 36 CFR Part 212" (Lassen RDEIS, page 13). The environmental analysis is based on the best available information, which indicates that increased funding for snow trail grooming is not expected (Lassen RDEIS, Summary).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	246-16: Comment asserts that the EIS also must include an alternative under which no areas or routes would be designated for recreational OSV use. Unlike in a typical NEPA analysis where the no action alternative provides that baseline for comparison, the no action alternative for most winter travel planning efforts, including on the Lassen, reflects the current management status quo allowing cross-country OSV travel by default across the vast majority of the forest.	246-16: An alternative in which no areas or trails would be designated for OSV use would not address the purpose and need for the designations (RDEIS, page 13) which is to provide a manageable, designated system of OSV trails and areas within the Lassen National Forest that is consistent with and achieves the purposes of the Forest Service Travel Management Regulations at 36 CFR part 212, Subpart C. There is also a need to designate a system of OSV trails and areas within the Lassen National Forest that provides public access, promotes the safety of all recreational enthusiasts, enhances public enjoyment, minimizes impacts to natural and cultural resources, and minimizes conflicts among various resources. Furthermore, neither the executive orders nor the travel management regulations require a "no OSV use" alternative. "Such an interpretation would not reflect the full context of E.O. 11644 or other laws and policies related to multiple use of NFS lands. Neither E.O. 11644, nor these other laws and policies, establish the primacy of any particular use of trails and areas over any other. The Department believes 'shall consider * * * with the objective of minimizing * * *' will assure that environmental impacts are properly taken into account, without categorically precluding motor vehicle use" (70 FR 68281, November 9, 2005).
Recreation	C/R #31 (General Opposition to Alternative 3): Comment expresses opposition to alternative 3.	C/R #31 (General Opposition to Alternative 3): Thank you for your comment. Alternative 3 is only one of four action alternatives being analyzed in detail in this analysis. There are two other action alternatives that may address the comment's concerns.
Recreation	226-3a: Comment expresses opposition to alternatives 2, 3, and 5, especially closure of the Colby Mountain area.	226-3a: Thank you for your comment.
Recreation	583-9, 583-11: Comment opposes alternatives 2, 3 and 5.	583-9, 583-11: Thank you for your comment.
Recreation	C/R #19 (General Opposition to Alternative 5): Comments oppose alternative 5 because it restricts OSV access too much.	C/R #19 (General Opposition to Alternative 5): Alternative 5 is just one of the alternatives being analyzed in detail in managing OSV use on the Lassen National Forest. Alternative 5 would designate the least amount of land on the Lassen National Forest for OSV use. Other action alternatives (2, 3, and 4) being analyzed in detail would designate larger amounts of land for OSV use.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	251-3d: Comment opposes any alternative that does not designate PCT crossings and/or creates arbitrary non-motorized buffers. Creating arbitrary PCT OSV buffers on the Lassen NF would also threaten a highly unwarranted and controversial precedent that could impact hundreds of miles of motorized summer and winter recreational opportunities on routes or open areas that parallel, cross, or are in otherwise close proximity to the PCT.	251-3d: Current regulations prohibit the use of motorized vehicles on the Pacific Crest National Scenic Trail without a special-use authorization (36 CFR § 261.20 Pacific Crest National Scenic Trail; [49 FR 25450, June 21, 1984. Re-designated at 70 FR 68291, Nov. 9, 2005]). All action alternatives in this analysis identify the Pacific Crest National Scenic Trail as not-designated for OSV use. All action alternatives would designate trails for OSVs to cross the Pacific Crest National Scenic Trail. The Forest Service is also analyzing for the potential effects of non-designated areas around the trail itself. Alternatives 2 and 5 provide for a 500-foot-wide area not designated for OSV use on either side of the trail. Alternatives 3 and 4 do not include this area of non-designation. The Forest Service recognizes that through-use on the Pacific Crest National Scenic Trail is minimal and that use conflicts have not been reported. Nonetheless, some through use has occurred and various directives and regulations suggest that protections of the Pacific Crest National Scenic Trail beyond the trail tread itself are warranted. The Pacific Crest National Scenic Trail Comprehensive Management Plan (1982) affirms that snowmobiling along the trail is prohibited by the National Trails System Act and motorized use of adjacent land should be zoned to mitigate the noise of conflict. Guidelines for designated PCT crossing frequencies are based on the recreation opportunity spectrum. Management of National Scenic Trails (NST) provide for the conservation and enjoyment of significant scenic, historic, natural, or cultural qualities. Other uses along the trail, which would not substantially interfere with the nature and purposes of the trail, may be permitted. Reasonable efforts shall be made to provide sufficient access opportunities to such trails and, to the extent practicable, efforts shall be made to avoid activities incompatible with the purposes for which such trails were established. (National Trails System Act, P.L. 90-543). Executive Order 13195 Trails for the 21st Century. Protecting the national scenic trails and the high priority potential sites and segments of national historic trails to the degrees necessary ensures that the values for which each trail was established remain intact. The Forest Service recognizes that there is no regulatory requirement for a specified distance of non-designation from the trail tread. However, some examples and suggestions exist. The Appalachian National Scenic Trail minimum corridor is defined in forest plans as 500 feet of centerline. There is no prescribed distance for a minimum corridor in legislation or the Lassen National Forest Plan.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	251-3d: Comment opposes any alternative that does not designate PCT crossings and/or creates arbitrary non-motorized buffers. Creating arbitrary PCT OSV buffers on the Lassen NF would also threaten a highly unwarranted and controversial precedent that could impact hundreds of miles of motorized summer and winter recreational opportunities on routes or open areas that parallel, cross, or are in otherwise close proximity to the PCT. (continued)	The Pacific Crest Trail Association requested a minimum non-designated width of 500 feet on each side of the trail for the Pacific Crest National Scenic Trail. Under the current alternatives the Forest Service is analyzing for non-designated areas between 0 and 500 feet from the Pacific Crest National Scenic Trail tread. This will help the Forest Service consider what distance, if any, is needed to minimize potential conflicts between OSV use and other recreational uses. All designated trails across the Pacific Crest National Scenic Trail would occur over National Forest System roads and should be readily identifiable under most conditions, either visually or through GPS tracking. All designated OSV trails that would cross the PCT would be located on existing roads identified on the current Forest winter recreation map and would be identified in any subsequent OSV use map developed after the decision is issued. However, the Forest Service recognizes that, under some extreme snowfall conditions, it may be impossible to accurately identify designated trails across the PCT.
Recreation	247-7: Comment asserts there should be an additional alternative that allows more motorized use than allowed under existing management.	247-7: Current management allows as much OSV access on the forest as allowed by laws, regulations, and policies. We are analyzing one alternative in detail (alternative 2) that is as similar as possible to current management while still being consistent with laws, regulations, and policies.
Recreation	225-12: Comment expresses need for a more motorized alternative that designates more areas of the forest for OSV use than those currently being considered.	225-12: We are analyzing one alternative in detail (alternative 2) that is as similar as possible to current management while still being consistent with laws, regulations, and policies.
Recreation	247-26: Comment asserts the LNF has not included a Pro-OSV Alternative. The Travel Management Plan is clearly intended to manage motorized travel in the National Forests while preserving recreation opportunities. However, the LNF plan has four alternatives that cater only to non-motorized interests. All four action alternatives substantially reduce OSV use by expanding non-motorized areas.	247-26: Alternative 4 was specifically developed and provided to us by the local OSV community to meet the needs of current OSV use. Currently, approximately 84 percent of the forest is open to OSV use. Action alternatives propose anywhere from a 1 percent (alternative 4) to a 45 percent (alternative 5) reduction in areas designated for OSV use. In all cases, more than half of the forest would be designated for OSVs. We are analyzing one alternative in detail (alternative 2) that is as similar as possible to current management while still being consistent with laws, regulations, and policies.
Recreation	257-4: The RDEIS analyzes four alternatives that cater only to non-motorized interests. All four alternatives substantially reduce OSV opportunity by expanding non-motorized areas. Alternatives 2 and 3 have very little that benefit OSV use and 5 has no redeeming value at all. The FEIS should include a suitable Pro-OSV alternative.	257-4: Thank you for your comment. We are analyzing one alternative in detail (alternative 2) that is as similar as possible to current management while still being consistent with laws, regulations, and policies.
Recreation	623-2: Comment raises the concern that there is no pro-OSV alternative.	623-2: We are analyzing one alternative in detail (alternative 2) that is as similar as possible to current management while still being consistent with laws, regulations, and policies.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	629-2b: Comment states that the revised version of the preferred alternative reflects the extensive analysis of OSV travel that has been undertaken previously and that current management is effective.	629-2b: The RDEIS does not identify a preferred alternative. One will be identified in the Revised FEIS. The proposed action is one alternative in a range of alternatives that is being analyzed in detail.
Recreation	629-72: Comment believes " that the revised version of the preferred Alternative reflects the extensive analysis of OSV travel that has been undertaken previously and that current management is effective as reflected by the low levels of public comment that have been received on the Proposal".	629-72: Thank you for your comment. The RDEIS does not identify a preferred alternative. A preferred alternative will be identified in the Revised FEIS.
Recreation	245-1: Comment supports an option that is closest to Status Quo and the agency should even consider the elimination of some existing arbitrary restrictions...that would really be the best direction to proceed considering that OSV impact within LNF (and all NFs) is virtually non-existent and the economic benefits strong with potential to be even greater.	245-1: Thank you for your comment.
Recreation	629-3: Comment asserts that current management is effective based on the lack of adverse impacts and comments received.	629-3: Thank you for your comment. We are analyzing one alternative in detail (alternative 2, RDEIS, page 32) that is as similar as possible to current management while still being consistent with laws, regulations, and policies.
Recreation	C/R #14 (General Support for No Change in Management): Comments express support for no-action alternative.	C/R #14 (General Support for No Change in Management): The no-action alternative would not address the purpose and need for action (RDEIS, page 13) and would also not be consistent with the executive orders or the travel management rule (36 CFR Part 212) which requires us to designate roads, trails, and areas for OHV use while minimizing impacts. We are analyzing one alternative in detail (alternative 2) that is as similar as possible to current management while still being consistent with laws, regulations, and policies.
Recreation	C/R #20 (General Support for Alternative 2): Comment supports alternative 2.	C/R #20 (General Support for Alternative 2): Thank you for your comment. Alternative 2 (RDEIS, page 32) is being analyzed in detail and it would designate the most trails and areas for OSV use on the Lassen National Forest out of all of the action alternatives.
Recreation	21-4, 25-2, 40-3, 68-1, 68-2, 111-2, 3B116:C21362-1, 537-2: Comment expresses appreciation that alternative 5 does not designate any key deer winter range as open for OSV use.	21-4, 25-2, 40-3, 111-2, 362-1, 537-2: Thank you for your comment. Alternative 5 is one alternative that is being analyzed in detail.
Recreation	250-7y: Shasta OSV Area: Due to the area's low elevation it provides little opportunity for motorized winter recreation. Therefore, Comment supports alternative 5.	250-7y: Thank you for your comment. Alternative 5 is one alternative that is being analyzed in detail.
Recreation	254-1: Comment supports alternative 5.	254-1: Thank you for your comment. Alternative 5 is one alternative that is being analyzed in detail.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	254-21: Comment: Alternative 5 is the only alternative that minimizes OSV impacts to deer populations. Alternative 5 does not designate any key deer winter range designated for OSV use, which is critically important for protecting deer populations. This is a good first step towards meeting the requirement to minimize impacts to wildlife and their habitat.	254-21: Thank you for your comment. Alternative 5 is one alternative that is being analyzed in detail.
Recreation	C/R #1 (General Support for Alternative 5): Comment supports alternative 5.	C/R #1 (General Support for Alternative 5): Thank you for your comment. Alternative 5 is being analyzed in detail as one option for designating trails and areas for OSV use and for identifying snow trails to be groomed on the Lassen National Forest.
Recreation	C/R #16 (General Support for Alternative 5 with Reasons): Comments support Alternative 5 because it protects Wilderness, proposed Wilderness, Semi-Primitive Non-Motorized areas, and Research Natural Areas, and also provides for protected non-motorized experiences along the Pacific Crest Trail, other National Recreation Trails and important Nordic and backcountry ski areas.	C/R #16 (General Support for Alternative 5 with Reasons): Thank you for your comment. Alternative 5 is one alternative that is being analyzed in detail.
Recreation	195-1: Comment expresses support for alternatives 1 and 4.	195-1: Thank you for your comment. Alternative 4 is one action alternative being analyzed in detail.
Recreation	582-6: Comments supports alternatives 3 and 5.	582-6: Thank you for your comment. Alternatives 3 and 5 are being analyzed in detail.
Recreation	243-3: Comment asserts that designated OSV management areas are not adequately sized for OSV management.	243-3: Designated OSV areas are consistent with the size requirements of the travel management regulations (see definition of an area in 36 CFR 212.1 and page 2 of the RDEIS).
Recreation	255-3: Comment expresses disappointment that the revised proposed action allows cross-country snowmobiling across more acres than the original proposal. The Forest Service proposes to allow snowmobile use across 87% of the forest.	255-3: The modified proposed action would designate approximately 26,000 fewer acres for cross-country OSV use than the original proposal. The original proposed action, as scoped, and the modified proposed action in the first DEIS both designated 947,120 acres for cross-country OSV use (82 percent of the forest). The modified proposed action in the first FEIS designated 921,130 acres for cross-country OSV use (80 percent of the forest). The modified proposed action in the Revised DEIS designated 921,180 acres for cross-country OSV use (80 percent of the forest).
Recreation	624-2: "Modified Proposed Action" (Alternative 2) is otherwise almost exactly the same as what was proposed in 2015 — it does not protect important quiet recreation areas or wildlife habitat and would designate as open for OSV use low elevation areas that rarely receive snow. Likewise, Alternatives 3 and 4 are also essentially the same as in 2015.	624-2: The modified proposed action would designate approximately 26,000 fewer acres for cross-country OSV use than the original proposal. Alternatives 3 and 4 are very similar to those described in the original DEIS. The analysis in the Revised FEIS will determine whether these alternatives protect important quiet recreation areas or wildlife habitat.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	629-2a: Comment supports the fact that most current management standards, such as mileages of groomed routes and existing area boundaries, are generally carried forward in the revised proposal.	629-2a: Thank you for your comment. We are analyzing one alternative in detail (alternative 2, RDEIS, page 32) that is as similar as possible to current management while still being consistent with laws, regulations, and policies.
Recreation	629-71: Comment "support the fact that most current management standards, such as mileages of groomed routes and existing area boundaries, are generally carried forward in the revised Proposal".	629-71: Thank you for your comment.
Recreation	254-10: Comment proposes modifications to boundaries in the Jonesville Area designated for OSV use.	254-10, 254-12: These modifications are considered under one or more of the alternatives being analyzed in detail.
Recreation	232-4: Comment states that it would be more effective to use the PCT as the boundary between two designated OSV areas instead of an area not designated for OSV use within an OSV area. Comment states that one advantage of this method is that an arbitrary (and legally ambiguous) 500-foot corridor would not be necessary to protect the PCT. Instead, the boundaries of the two nearby OSV Areas could be drawn with regard to terrestrial features (wherever available) that make for easier recognition of limits as opposed to a 500-foot setback from an unseen feature (the snowbound PCT). Comment states that another advantage of this method is that it truly is "discrete" insofar as it respects the legal status of the PCT.	232-4: While we appreciate the comment's alternative approach, we don't find it any more advantageous than what we propose. Alternative 5 uses this approach to some extent. However, terrain features are not necessarily more easily recognized or discernible than a strip of land not designated for OSV use of a given width along the Pacific Crest National Scenic Trail. Furthermore, the use of terrain features set back from the Pacific Crest National Scenic Trail would arbitrarily limit OSV use in areas where it does not have to be limited. The comment's approach would also make it more difficult for OSVs to cross the Pacific Crest National Scenic Trail on designated trails to move from one designated OSV area to another.
Recreation	C/R #39 (General Opposition to Not Designating Black Mountain RNA): Comment asks the reason why the Black Mountain Research Natural Area exists and why it would not be designated for OSV use.	C/R #39 (General Opposition to Not Designating Black Mountain RNA): The 1992 Lassen National Forest Land and Resource Management Plan (Forest Plan) designated the Blacks Mountain RNA. The purpose of its creation was to preserve an ecological baseline for the Blacks Mountain Experimental Forest of which it is a part (Forest Plan, page 3-26). Forest Plan management direction prohibits the use of motorized vehicles within any designated RNA on the Lassen National Forest.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	196-4d: Bogard OSV Area—The RDEIS states, "Bogard OSV Area - The size of this area ranges from a minimum of 243,620 acres to a maximum of 330,180 acres, depending on the alternative. It is bounded by Highway 44 to the south and west and by the forest boundary to the north and east in the northeastern part of the forest. This OSV area is accessible from the communities of Burney, Fall River, Old Station and Susanville and from the Bogard Trailhead on Highway 44." The boundary of this area in Alternative 2 overlaps the PCT and extends across the Hat Creek Rim. This area does not receive significant snow pack, has rocky terrain, and is therefore not well suited for OSV use. Comment urges the Forest to incorporate the smaller area boundary proposed in Alternative 5 which is more realistic and better meets the management direction for the PCT.	196-4d: Thank you for your comment. Alternative 5 is one of four action alternatives analyzed in detail in the RDEIS.
Recreation	250-7i: Bogard OSV Area: Prohibit OSV use in Brockman Flat Lava Beds.	250-7i: The RDEIS analyses one alternative in detail (alternative 5) in which the Brockman Flat Lava Beds would not be designated for OSV use.
Recreation	629-65: Comment suggests that closures around or through non-motorized areas are not effective at deterring user conflicts.	629-65: The Forest Service is analyzing the potential effects from implementing alternatives that do not designate an area 500 feet from the centerline on either side of the Pacific Crest National Scenic Trail, as well as alternatives that designate these areas for OSV use. The effects analysis will be used to inform the decision.
Recreation	629-70: Comment suggests that "educational materials or programs that might be developed to address socially based user conflicts in areas where non-motorized routes are crossing open riding areas are a highly effective tool for addressing possible conflicts".	629-70: The Forest Service currently uses educational materials in the form of a published Winter Recreation map, information posting at trailhead kiosks, public service announcements and information on the forest's webpage to better inform recreation enthusiasts of new information regarding winter recreation. These materials have been highly effective in that few use conflicts have been reported for the Lassen National Forest.
Recreation	197-2: Comment states the setting of a date for the OSV season is arbitrary and that major snow events in can occur in the month of November.	197-2: None of the alternatives would set a start or end date for when OSV use would be allowed to occur on the forest. OSV use would be allowed in the areas and trails designated for OSV use whenever snow conditions allow it.
Recreation	247-32: Comment objects to using dates to restrict snowmobile use.	247-32: None of the alternatives would set a start or end date for when OSV use would be allowed to occur on the forest. OSV use would be allowed in the areas and trails designated for OSV use whenever snow conditions allow it.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	623-10: Comment raises issue with fixed dates for the prohibition of wheeled vehicles on groomed OSV routes between December 26 and March 31.	623-10: These wheeled vehicle prohibitions are to protect groomed OSV routes from rutting that can be caused by wheeled vehicles. This closure went through public input, analysis required by NEPA, and review and was incorporated into a signed decision under the Subpart B Travel Management Record of Decision in 2010. This closure allows appropriate access to other winter recreation enthusiasts while maintaining the integrity of the groomed OSV system during the peak season of OSV use. It is not being revisited in any of the alternatives in this document.
Recreation	629-44: Comment requests that the decision should not be based on set dates of OSV use or elevation.	629-44: None of the alternatives would set a start or end date for when OSV use would be allowed to occur on the forest. OSV use would be allowed in the areas and trails designated for OSV use whenever snow conditions allow it.
Recreation	247-11: Comment asserts that the proposals establish de facto wilderness and do not reflect the ratio of wilderness visitors to those using other parts of the forest.	247-11: None of the alternatives presented in the RDEIS establish new wilderness areas. The RDEIS analyzes alternatives with variable areas of designation to balance the management of protecting natural and cultural resources and minimizing use conflicts. The comment incorrectly assumes that OSV use is the dominant winter activity on the forest and any decision should be weighed in favor of designating areas for this activity. However, minimizing use conflict is an important objective in this analysis and the Forest Service recognizes that multiple winter activities occur on the forest. Visitor use data (RDEIS, Chapter 3: Recreation) indicates that OSV use accounts for approximately 2 to 8 percent of forest activities during the winter.
Recreation	254-7: Comment has largely re-stated components of various alternatives and appears to be in agreement with most proposals. Comment also suggests some modifications: "However, we propose slightly modifying this boundary to allow OSV use in the western bowls on Diamond Peak and in the lower elevation terrain on the south side of the Diamond mountains, accessed from the Plumas National Forest. Finally, there is a small area bounded by groomed OSV trails that is used by backcountry skiers but not by snowmobilers. We propose modifying the Fredonyer boundary to not allow OSV use within the area bounded by routes 29N46, 29N85, and ULA557."	254-7: Thank you for your comment. Alternative 5 is being analyzed in detail and addresses this concern by not designating the areas in question (reference map in RDEIS). Alternative 2 designates OSV use in the western bowls of Diamond Peak and in the lower elevation terrain on the south side of the Diamond mountains.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	625-1a: Comment recommends non-motorized use areas on Lassen National Forest for winter sports, primarily back country skiing, submits photographs of Diamond Mountain south of Susanville showing where the snowfields (bowls) are that skiers enjoy. With the increased interest in snowshoeing and snowboarding in the backcountry, the areas comment recommends for non-motorized use would also be good for those non-motorized users too. Split boarding has become increasingly popular and so this use would also fit right in with back country skiing on steeper slopes such as the bowls of Diamond Mountain and the ridge south of Fredonyer Pass.	625-1a: The RDEIS analyzes an alternative in detail (alternative 5) in which these areas would not be designated for OSV use.
Recreation	C/R #8 (General Request to Not Designate Diamond Mountain for OSV Use): Comments request that we protect the east side of Diamond Mountain for human-powered activities and designate the west side of Diamond Mountain as designated for snow machine use.	C/R #8 (General Request to Not Designate Diamond Mountain): The request is addressed in alternative 5.
Recreation	629-48 Comment recommends that education be used to inform the public regarding multiple use decisions on the Lassen.	629-48: The Forest Service currently uses educational materials in the form of a published Winter Recreation map, information posting at trailhead kiosks, public service announcements and information on the forest's webpage to better inform recreation enthusiasts of new information regarding winter recreation. These materials have been highly effective in that few use conflicts have been reported on Lassen National Forest.
Recreation	257-15: Comment opposes the 3,500-foot rule (i.e., no OSV use below 3,500 feet). Comment requests a definition of resource damage. Comment opposes a buffer on each side of the PCT. Comment opposes reductions in OSV opportunity except by the agreement of the OSV community. Comment supports concurrence on any proposed non-motorized area.	257-15: Thank you for your comment. The range of alternatives includes alternatives that would designate areas below 3,500 feet in elevation for OSV use. The EIS considers alternatives in which snow conditions will determine when or where an OSV can be used. The range of alternatives analyzed in detail includes alternatives 3 and 4 which would designate areas immediately adjacent to the Pacific Crest National Scenic Trail for OSV use.
Recreation	145-2: Comment disputes closing 29,000 acres below the 3,500-foot elevation and recommends just a snow depth requirement similar to other areas. Restricting to 3500 ft. and below restricts more than just those areas as it keeps OSV enthusiasts from getting to other areas that they are allowed to ride	145-2: The range of alternatives includes alternatives that would designate areas below 3,500 feet in elevation for OSV use.
Recreation	231-6: Comment asserts that a 3,500-foot elevation restriction would be unenforceable and that ground conditions should determine whether OSV use should occur.	231-6: The range of alternatives includes alternatives that would designate areas below 3,500 feet in elevation for OSV use.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	236-1: Comment suggests that snow conditions rather than elevations should determine where OSVs can be used.	236-1: Thank you for your comment. The range of alternatives includes alternatives that would designate areas below 3,500 feet in elevation for OSV use. The EIS considers alternatives in which snow conditions will determine when or where an OSV can be used.
Recreation	247-27: Comment opposes the 3,500-foot elevation restriction.	247-27, 623-6, 623-21: The Forest Service is analyzing alternatives for their potential effects, including three that would designate areas or trails below 3,500 fee. This analysis will serve to inform the decision.
Recreation	257-11: Comment opposes defined snow depth, or restrictions, in areas less than 3,500 feet designated for cross-country OSV travel or on designated OSV trails. OSV use should be allowed only when conditions are sufficient to allow OSV use while protecting underlying resources.	257-11: The range of alternatives includes alternatives that would designate areas below 3,500 feet in elevation for OSV use. The EIS considers alternatives in which snow conditions will determine when or where an OSV can be used.
Recreation	579-1: Comment supports the prohibition of OSV use in any area below 3,500 feet in elevation in Lassen National Forest to ensure an adequate amount of snowfall for OSV use. Comment recommends that the Final EIS include a clear provision to adjust this restriction, as needed, to adapt to possible changes in temperature and precipitation in the project area that could alter the minimum elevation at which snowfall occurs. This would ensure that OSV activities are directed to areas with sufficient snow cover for responsible use into the foreseeable future.	579-1: Alternative 5 does not designate areas below 3,500 feet in elevation for OSV use.
Recreation	623-6, 623-21: Comment does not want to see the low elevation restriction currently proposed in some of the alternatives.	623-6; 623-21: The Forest Service is analyzing alternatives for their potential effects, including three that would designate areas or trails below 3,500 feet.
Recreation	629-40: Comment is opposed to OSV prohibitions based solely on elevation.	629-40: The Forest Service is analyzing several alternatives for their potential effects, including three that would designate areas or trails below 3,500 feet. This analysis will serve to inform the decision.
Recreation	C/R #42 (General Support of Elevation Restriction): Comment lives near the Ishi wilderness area at 3,200 feet in elevation and states there has been rarely a winter where you could take a snowmobile out at 3,500 feet in 45 years. Supports closure of this area in alternatives 5 and 2.	C/R #42 (General Support of Elevation Restriction): Thank you for your comment. This option is considered in the EIS. Alternative 5 does not designate areas below 3,500 feet in elevation for OSV use.
Recreation	C/R #49 (General Opposition to Elevation Restriction): Comments oppose the prohibition of OSV use below the 3500-foot elevation as arbitrary.	C/R #49 (General Opposition to Elevation Restriction): This restriction is only considered as part of one of the alternative being analyzed in detail. No decision has been made as to whether it would be included in the decision. The range of alternatives includes alternatives that would designate areas below 3,500 feet in elevation for OSV use.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	196-4e: Fall River OSV Area—The RDEIS describes this area, "Fall River OSV Area - The size of this area ranges from undesignated (zero acres) to a maximum of 42.440 acres, depending on the alternative. It is not shown on the 2005 Winter Recreation Guide for the Lassen National Forest, but is currently open to OSV use. It is located in the vicinity of Lake Britton and MacArthur-Burney State Park. This area is also isolated from the remaining Lassen National Forest and comprises areas of the Shasta-Trinity National Forest administered by the Lassen National Forest. Nearby communities include Burney and Fall River. This area is within a zone of historically minimal snowfall and combined with the state park, tends to serve more as a focal point for non-motorized recreation. Although designated for OSV use, OSV opportunities are irregular throughout this area as there may not be sufficient snow in all parts of this area every year. No marked OSV trails currently exist in this area." It is clear from this description, as well as my observations from spending a considerable amount of field time in this area over the past nine years, that this area is not conducive for OSV use. Additionally, this area overlays the PCT. Comment strongly suggests the Forest adopt the proposal in Alternative 5 to not include this area in the final alternative or decision.	196-4e: Alternative 5 is analyzed in detail in the RDEIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	250-7k: Fredonyer OSV Area: Hamilton Mountain (7,387') and the unnamed peak northwest of it (7,138') provide skiing opportunities for intermediate backcountry skiers close to the Fredonyer staging area. The Diamond Mountains are located in the eastern portion of the OSV Area and provide excellent OSV and backcountry skiing opportunities on north-facing slopes close to Susanville. Backcountry skiers access the area in early winter and spring when they can drive up 29N43 to access Cabin and Basque Bowls, immediately east of an unnamed peak locally known by skiers as The Nipple (7,399' on the Diamond Mountain 1:63,360 map in the Lassen National Forest Atlas). To improve non-motorized winter recreation opportunities: 1. Designate a non-motorized winter recreation areas in the vicinity of Hamilton Mountain and east of Diamond Mountain. 2. Restrict OSV use in an area around Hamilton Mountain bounded by 29N46, 29N85 and 29N85F. 3. Prohibit OSV use east of The Nipple (T28N, R12E sec. 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16).	250-7k: We have no record of use conflict in this area and have designated the areas identified in the comment for OSV use in all alternatives.
Recreation	625-1b: Comment states the proposed trails north of Fredonyer Pass that are being planned by local trails enthusiasts in cooperation with Lassen National Forest's Eagle Lake Ranger District staff would be well suited for non-motorized winter use. So please designate the area north of Highway 36 at Fredyoner Pass for non-motorized use. This area includes the area east of the road from the pass north to Goumaz that is groomed for snowmobiles (leave this road open for snowmobiling); the area between Highway 36 and the Bizz Johnson Trail and the area of Lassen National Forest approximately 4 miles to the east of Fredonyer Pass where Highway 36 and the Bizz Johnson Trail intersect at Devil's Corral. However, leave a cross-country access route for snowmobiles open beneath or adjacent to the powerline that extends up to Fredoyner Pass road from Devil ' s Corral so snowmobilers can continue to access the snowmobile staging area and groomed trails at Fredonyer Pass from the Lake Forest community west of Susanville when suitable snow cover occurs.	625-1b: The non-motorized trails being considered are only in the planning stages at this point and no decision has been made to create them. However, in alternatives 3 and 5, these areas would not be designated for OSV use.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	C/R #4 (General Opposition to OSV Use at Butte Lake and Fredonyer-Goumaz): Comment expresses desire to not designate the Fredonyer-Goumaz and Butte Lake areas to cross-country OSV use.	C/R #4 (General Opposition to OSV Use at Butte Lake and Fredonyer-Goumaz): Alternatives 3 and 5 are designed to not designate the Fredonyer-Goumaz and Butte Lake areas to cross-country OSV use, and we analyze their potential effects in detail in the EIS.
Recreation	250-7m: Jonesville OSV Area: The Colby Meadows Cross-country Ski Area provides 10 miles of ski trails for beginner and intermediate skiers. Adventure Outings of Chico State University maintains a yurt in Colby Meadows that can be rented by the public. Cross-country ski trails in Colby Meadows are closed to motorized use and most snowmobilers respect the closure. Off-Highway Vehicle trespass and resource damage occur in Colby Meadows frequently. · To enhance non-motorized winter recreation opportunities. Define non-motorized boundaries for the Colby Meadows Cross-country Ski Area (see map in comment letter #250).	250-7m: Alternative 5 addresses this concern.
Recreation	459-3: Comment states use-trespass is inevitable. Buffer zones are critical. So: ---Disallow any OSV use near McGowan Cross-Country Ski Trail. ---Disallow any OSV use within a quarter mile of the PCT, save for limited, necessary crossings.	459-3: The McGowan area ski trails and surrounding areas are not designated for cross-country OSV use in alternatives 3, 4, and 5. The total area not designated varies by alternative, but all are not designated for OSV use to some extent. There is no prescribed distance for a minimum width of an area not designated for OSV use in legislation or existing forest plans. However, we use 500 feet following the practice of other national scenic trails (e.g., the Appalachian National Scenic Trail). Furthermore, the Pacific Crest Trail Association (PCTA) requests an area to not be designated for OSV use 500 feet either side of the Pacific Crest National Scenic Trail.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	246-17, 216-18: See attachment 2 that includes (1) "joint recommendations in support of sustainable recreation management practices across nearly 250 million acres of national public lands" prepared by The Wilderness Society and Blue Ribbon Coalition; (2) Key Concepts for Implementing the Minimization Criteria; (3) Switalski, 2016, Snowmobile Best Management Practices for Forest Service Travel Planning; (3a) Literature Review and Recommendations for Management - Introduction to Snowmobile Management and Policy; (3b) Literature Review and Recommendations for Management - Water Quality, Soils, and Vegetation; (3c) Literature Review and Recommendations for Management - Wildlife; (3d)Literature Review and Recommendations for Management - Winter Recreational Use Conflict; (4) Hatchett, 2017, Evaluation of Observed and Simulated Snow Depths for Commencing Over Snow Vehicle Operation in the Sierra Nevada.	246-17, 216-18: We reviewed the literature submitted and determined that it contains no site-specific information that would require us to (1) Modify alternatives including the proposed action; (2) Develop and evaluate alternatives not previously given serious consideration; (3) Supplement, improve, or modify the analysis; or (4) Make factual corrections as required by 40 CFR §1503.4(a). As pointed out in the RDEIS, the Forest Service has limited or no reports of use conflicts or resource damage in almost three decades of monitoring OSV and non-motorized use during the winter. Areas of particular concern for specific resources are already identified as not designated for OSV use. The analyses in chapter 3 determine no negative impacts to any resource and no use conflicts. The recommendations in the suggested literature reviews assume these negative impacts and use conflicts would occur. If they were to occur, the recommendations in the suggested literature for management to minimize those impacts would have been considered.
Recreation	246-10: Comment asserts that none of the action alternatives apply the minimization criteria for designated OSV trails or for trails identified but not designated.	246-10: There are trails identified within designated areas but not designated as OSV trails. We considered the minimization criteria in designating those areas, but saw no need to apply the minimization criteria on a trail-by-trail review. The reason for this was that as long as we applied the minimization criteria on the areas to be considered for designation, actual impacts to these areas would be further reduced because experience shows that OSV use has been and would continue to be concentrated on these undesignated trails, all of which would overlie the existing road system. Furthermore, OSV travel on this road system would cause no cultural or natural resource damage and most are located beyond the reach of non-motorized uses, thereby minimizing use conflicts. Also, in designating these OSV areas where these non-designated OSV trails are located, we have mitigated potential adverse effects to listed and sensitive wildlife species.
Recreation	246-12: Comment asserts the RDEIS does not adequately demonstrate how impacts to roadless and Wilderness values have been minimized under each alternative.	246-12: Wilderness areas and proposed wilderness areas on the forest would not be designated for OSV use under any alternative analyzed in detail in the RDEIS. The EIS discloses the potential impacts of each alternative on the Wilderness values in Inventoried Roadless Areas. The analysis identifies no long-term impacts to Wilderness values of these areas and would not reduce the likelihood that the Forest Service would recommend the areas or that Congress would eventually designate them as wilderness.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	246-2: Comment asserts that alternatives 1-4 continue to suffer from a number of deficiencies, including questions about whether the Forest Service has adequately minimized impacts to sensitive wildlife, roadless and Wilderness values, non-motorized uses, and other forest resources.	246-2: Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2).
Recreation	246-3: Comment supports alternative 5 as long as the following deficiencies are remedied: 1. Better articulate how the boundaries of open areas were delineated to minimize impacts to natural resources and conflicts with other recreational uses. 2. Ensure that all areas identified as "not conducive to OSV use" are eliminated from open areas. 3. Ensure that all OSV trails - including those located within open areas - that are maintained, marked on the ground, and/or displayed on any winter recreation guides or use maps are analyzed and designated according to the minimization criteria. 4. Ensure that OSV designation decisions minimize impacts to roadless and Wilderness values and do not prejudice the mandatory wilderness recommendation process in the upcoming forest plan revision by excluding Inventoried Roadless Areas that receive little or no OSV use from open area designations.	246-3: The comment correctly identifies some deficiencies in how alternative 5 was designed. 1. Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2). 2. We inadvertently confused readers with the use of the term "not conducive" and will correct the Revised FEIS. The intent is to identify trails and areas where OSV use would be low. 3. The OSVUM will show areas and trails where OSV use would be allowed. Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2). 4. Proposed OSV designations in roadless areas and in areas with Wilderness values do not prejudice wilderness recommendation processes. OSV use in these areas would not result in any long-term adverse effects to their existing roadless or Wilderness values that would preclude their consideration as wilderness in the future. No proposed wilderness areas or trails within proposed wilderness areas would be designated for OSV use in any alternative.
Recreation	246-4: Comment observes that RDEIS does not demonstrate compliance with the minimization criteria at a "granular" level how each area and route was located to minimize impacts... Refers to attachment to their letter in which The Wilderness Society and BlueRibbon Coalition/Sharetrails.org recently released a set of joint recommendations designed to assist federal land management agencies with compliance (attached to letter 246).	246-4: OSVs have been operated in the Lassen National Forest on existing identified OSV trails and in existing identified OSV areas for decades with no record of impacts to forest resources or use conflicts. The Forest Service completed an Environmental Assessment of OSV use on the Lassen National Forest in 1989. This Environmental Assessment identified areas of potential impact to natural and cultural resources, and therefore we did not establish OSV trails in these areas. For the current designation process, utilizing minimization criteria, we identified some areas where potential impacts or use conflicts might be possible and did not designate those areas and trails in some alternatives.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	246-8, 246-9: Comment asserts the Forest Service has not demonstrated how areas and trails have been located to minimize impacts. There is no granular analysis of individual trails across the large open areas - some of which span hundreds of thousands of acres and includes dozens of miles of designated trails.	246-8, 246-9: OSVs have been operated in the Lassen National Forest on existing identified OSV trails and in existing identified OSV areas for decades with no record of impacts to forest resources or use conflicts specifically attributed to OSV use. In the last five years, approximately 100 cultural resource sites have been impacted by OHV use. Some if these impacts may be from OSV use, but our monitoring does not differentiate between OHV and OSV impacts. We completed an Environmental Assessment of OSV use on the Lassen National Forest in 1989. That Environmental Assessment identified areas of potential adverse impacts to natural and cultural resources, and we did not establish OSV trails in the areas where these resources would be adversely affected. Furthermore, we know other forests have recorded resource damage and use conflicts and we have law enforcement reports of inadvertent OSV incursions into areas where OSV use is prohibited, such as Wilderness. For the current designation process, utilizing minimization criteria, we identified some areas where potential adverse impacts or use conflicts might be possible and minimized those effects where they have the potential to occur.
Recreation	254-12: Comment has largely re-stated components of various alternatives with suggestions for areas of non-designation related to wildlife or other natural resource concerns and to minimize use conflict in specific areas.	254-12: These modifications are considered under one or more of the alternatives being analyzed in detail.
Recreation	254-13: Comment raises issues regarding the number of designated and non-designated trail opportunities under a variety of the alternatives. Specifically, the Comment states: "The LNF cannot claim an 83% (or more) reduction in route density and use this figure in the minimization analysis unless those routes are no longer physically available for OSV use. At the very least, any route that is maintained (by signage or otherwise) must be considered a "designated" route and included in the analysis". Comment is further concerned about potential safety issues if only a small proportion of non-designated routes are ultimately shown on a recreation map.	254-13: The Forest Service disagrees with this assessment. Roads that are non-groomed, but that occur within areas proposed for designation for OSV use are being analyzed under the appropriate alternatives. The comment is correct to point out that OSV enthusiasts will typically use these non-groomed roads as trails and much of the OSV use observed on the forest consists of trail riding on NFS roads covered in snow. In some alternatives, the availability of these ad hoc trails is significantly reduced because the areas in which they occur are being proposed as not designated. Therefore, the number of potential trails available to the OSV recreationist will vary significantly between alternatives. The Forest Service is not proposing to designate additional roads that could be used as trails if they already occur in areas proposed to be designated for OSV use. The exception is designating non-groomed trails through areas that are otherwise proposed as not designated for OSV use under some alternatives. The purpose here is to allow through use of OSVs where it is appropriate (to access other designated OSV areas and/or trails). The Forest Service is not concerned about the hypothetical safety issue raised by the comment because those roads are available under current management, and under most environmental conditions easily identified and followed. The Forest Service has not recorded a serious safety issue and is not expecting an increase in safety concerns.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	250-7t: Morgan Summit OSV Area: The McGowan Cross-country Ski Trail provides 10 miles of exceptional beginner and intermediate ski and snowshoe opportunities. The National Recreation Trail is accessible from a trailhead on Highway 89 south of Lassen Volcanic National Park and two trailheads on Highway 36 west of Morgan Summit. The 2.1 mile Church Camp Trail is often groomed. Human-powered winter recreationists envision a trail accessing the McGowan Cross-country Ski Trail system from Mineral. The location of the McGowan National Recreation Trail is disputed.	250-7t: We will determine the location and appropriate use of the trail (also known as the Heart Lake National Recreation Trail). It would not be designated for OSV use under alternative 3. This alternative is being analyzed in detail and would address the concern expressed in the comment.
Recreation	250-7ae: Swain Mountain OSV Area: The 25.5 mile Bizz Johnson National Recreation Trail traverses from east to west through the eastern portion of the Swain Mountain OSV Area. The National Recreation Trail Database shows that cross-country skiing is the only snow use permitted on the Bizz Johnson Trail. However, OSVs are currently allowed on seven miles in the western portion of the trail. To enhance non-motorized winter recreation opportunities near Susanville: 1. If feasible, we recommend curtailing OSV use on the Bizz Johnson National Recreation Trail and relocating motorized use to Lassen County Road 101. 2. Establish Designated Groomed OSV Trail in the Fredonyer-Goumaz Area. 3. Create non-motorized winter use area in the vicinity of Hog Flat Reservoir. Groom Lassen County Road 101 for motorized winter recreation instead of allowing OSV use on the eastern seven miles of the Bizz Johnson National Recreation Trail.	250-7ae: 1. Lacking a history of use conflict on this trail, we did not perceive a need to make changes in the availability of the Bizz Johnson trail to OSV use. 2. Planning for additional groomed trails is outside of the scope of the analysis because we currently do not expect an increase in funding that would allow more groomed OSV trails in the system. 3. This recommendation would be implemented in alternatives 3 and 5.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	250-7s: Morgan Summit OSV Area: Access is via Morgan Summit, Mill Creek and Mineral. Most motorized winter use occurs south of Highway 36 but snowmobilers wish to maintain access from Mineral to the Designated Ungroomed OSV Trail on Primary Forest Route 17 north of Highway 36. Snowmobilers envision a "Dream Trail" that would circumnavigate Lassen Volcanic National Park and link the Morgan Summit, Ashpan, and Swain Mountain OSV Areas. To enhance high quality motorized winter recreation opportunities: 1. Allow OSV access from Mineral to Primary Forest Road 17. 2. If permitted by the Secretary of Agriculture, allow OSV use on 30N16 west of Martin Creek.	250-7s: Alternative 4 would implement these recommendations.
Recreation	250-7u: Morgan Summit OSV Area: The Dry Lake Trail (30N16) is shown as closed to all motor vehicles during winter on the Lassen National Forest Winter Recreation Guide (2005). The National Recreation Trails Database (americantrails.org) shows the length of trail as 10 miles on Forest Roads 29N22 and 30N16 with elevations ranging from 5,020 to 6,200. Snowmobilers believe that the Dry Lake Trail west of the intersection of the Nanny Creek Trail and Dry Lake Trail is legally open to OSVs. Skiers believe the entire Dry Lake Trail (30N16) is closed to motorized use (as the Lassen Winter Recreation Guide shows). Skiers complain of motorized trespass multiple times per year and of early season OHV trespass. To enhance non-motorized winter recreation activities: 1. Develop non-motorized trails from Mineral to the Dry Lake Trail (30N16) via 29N36 and 29N11Y. 2. Encourage human-powered winter use on the Heart Lake National Recreation Trail east of Martin Creek. 3. Restrict OSV use through this area to the Dry Lake Trail (30N16) west of Martin Creek. 4. Prohibit OSV use on the Dry Lake Trail (30N16) east of Martin Creek. 5. Extend the non-motorized area below the Dry Lake Trail (30N16) west to Martin Creek and develop a non-motorized trails from Mineral to the Dry Lake Trail (30N16) via 29N36 and 29N11Y.	250-7u: Alternatives 3 and 5 address these concerns.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	250-7v: Morgan Summit OSV Area: The Morgan Summit OSV Area encompasses the Ishi Wilderness; Mill Creek, Heart Lake, and Spencer Meadows recommended Wilderness areas; the 3,900 acre recommended Indian Creek RNA, the Iron Mountain candidate RNA (in the Ishi Wilderness); Deer Creek and North Fork Antelope Creek SPNM areas; and three National Recreation Trails - McGowan Cross-country Ski Trail, Heart Lake Trail and Spencer Meadows Trail. The Morgan Summit OSV Area also contains the Deep Hole Geologic SIA. 1. Prohibit OSV use within the Deep Hole SIA. 2. Eliminate the two small Designated OSV Use Areas near Round Mountain (T27N, R2E, sec. 4) and Black Butte (T28N, R2E, sec. 29). 3. Designate the Indian Creek rRNA as an RNA. 4. Designate the Iron Mountain cRNA as a RNA. 5. Designate the Mill Creek Recommended Wilderness as Wilderness. 6. Designate the Heart Lake Recommended Wilderness as Wilderness. Include the IRA west of Loomis Peak and north of Blue Lake Canyon (Bailey Creek). 7. Designate the Spencer Meadows Recommended Wilderness as Wilderness. Extend the Recommended Wilderness boundary south on Wild Cattle Mountain to the Spencer Meadow Trailhead (use the IRA boundary).	250-7v: 1. All alternatives analyzed in detail in the RDEIS would designate the Deep Hole SIA for OSV use. All alternatives analyzed in detail in the RDEIS would designate the Crater Lake SIA for OSV use. However, proposed OSV designations in the Deep Hole SIA would not result in any long-term effects that would be detrimental to the features in the area. Although OSV use would be designated in some Special Interest Areas, we would manage these areas to "protect and preserve the values of each special area as identified in an establishment report or area management plan, in conformance with the Special Areas Prescription and Management Area direction," as required by the forest plan. These areas are also managed according to the designated Recreation Opportunity Spectrum classes in which they are located (forest plan page 4-68). 2. Alternative 2 addresses this concern by not designating the areas near Round Mountain (T27N, R2E, sec. 4) and Black Butte (T28N, R2E, sec. 29). 3. None of the alternatives analyzed in detail in the RDEIS would designate the Indian Creek recommended RNA for OSV use. 4. The Iron Mountain candidate RNA is located in the Ishi Wilderness where OSV use is prohibited by law. T 5. None of the alternatives analyzed in detail in the RDEIS would designate the Mill Creek recommended wilderness for OSV use. 6. None of the alternatives analyzed in detail in the RDEIS would designate the Heart Lake recommended wilderness for OSV use. The IRA west of Loomis Peak would not be designated under any alternative. 7. None of the alternatives analyzed in detail in the RDEIS would designate the Spencer Meadows Recommended Wilderness for OSV use.
Recreation	623-19: Comment is concerned that designated groomed trails and cross-country use are the only two classes of use proposed in any of the alternatives. Comment suggests that a third class, "ungroomed roads" be added. The Comment is further concerned with proposed snow depth restrictions on roads.	623-19: Thank you for your comment. The Forest Service does not see a need to specifically designate non-groomed roads if they occur within areas proposed to be designated for OSV use. The one exception in some alternatives is that the Forest Service has proposed designating non-groomed trails (all of which follow NFS roads) in order to accommodate OSV travel through areas that are otherwise being proposed as not designated for OSV use.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	629-15: Comment suggests that higher pressure OSV use be limited to groomed trails.	629-15: The Travel Management Regulations define an over-snow vehicle as 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. Any vehicles not consistent with this definition and therefore would not be subject to the designations resulting from this process. The analysis differentiates between different types of over-snow vehicles as long as they meet the definition of an OSV as stated in the regulations at 36 CFR 212.1. If we determine that differentiation is needed, further refinements in the designations resulting from this process will be considered in the future. If new information or changed circumstances relating to the environmental impacts of an action come to the attention of the responsible official after a decision has been made, the responsible official would review the information carefully to determine its importance. Consideration would be given to whether or not the new information or changed circumstances are within the scope and range of effects considered in the original analysis.
Recreation	629-17, 629-25, 629-26: Comment provides information and discussion regarding the design and potential impacts of non-traditional OSV types.	629-17, 629-25, 629-26: The Travel Management Regulations define an over-snow vehicle as 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. Any vehicles not consistent with this definition and therefore would not be subject to the designations resulting from this process. The analysis differentiates between different types of over-snow vehicles as long as they meet the definition of an OSV as stated in the regulations at 36 CFR 212.1. If we determine that differentiation is needed, further refinements in the designations resulting from this process will be considered in the future. If new information or changed circumstances relating to the environmental impacts of an action come to the attention of the responsible official after a decision has been made, the responsible official would review the information carefully to determine its importance. Consideration would be given to whether or not the new information or changed circumstances are within the scope and range of effects considered in the original analysis. If a correction, supplement, or revision to the environmental document is necessary, the responsible official will do so.
Recreation	629-47: Comment opposes a non-motorized corridor around the Pacific Crest Trail.	629-47: The analysis considers two alternatives that include areas along the Pacific Crest National Scenic Trail that would be designated for OSV use.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	629-54: Comment identifies an example of implemented travel management in the trail plan for the Continental Divide Trail and recommends that the Lassen adopt this type of standard.	629-54: Thank you for your comment. The management of the Pacific Crest National Scenic Trail is guided by the 1982 Comprehensive Management Plan for the Pacific Crest National Scenic Trail. The management of OSV use on the Lassen National Forest would be consistent with the direction in that plan. The purpose of this analysis is to designate areas and trails for over-snow vehicle use as required by the travel management regulations at 36 CFR Part 212, Subpart C. Neither the executive orders nor the travel management regulations which implement them are intended to regulate use of non-motorized trails such as the Pacific Crest National Scenic Trail.
Recreation	629-57: Comment supports the designation of multiple-use crossings of the Pacific Crest Trail.	629-57: The Revised FEIS considers alternatives (2, 3, 4, and 5) that designate OSV trails across the Pacific Crest National Scenic Trail.
Recreation	629-68: Comment opposes designation of a non-motorized corridor around the PCT and summarizes research on the nature of use-conflict.	629-68: Thank you for your comment. The Forest Service is analyzing alternatives for their potential effects, including two that designate areas for OSV use immediately adjacent to the Pacific Crest National Scenic Trail. The results of this analysis will be used to inform the decision.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	125-4, 126-3, 171-3, 187-6, 197-3, 218-2, 226-9, 465-1, 465-3: Comments assert that there should be no restriction in operating OSVs near the Pacific Crest Trail and no restrictions as to where OSVs can cross the Pacific Crest Trail. Comments typically assert that no non-motorized use of the PCT is observed during the winter, or that non-motorized users typically use OSV tracks to aid their access to other areas.	125-4, 126-3, 171-3, 187-6, 197-3, 218-2, 226-9, 465-1, 465-3: Current regulations prohibit the use of motorized vehicles on the Pacific Crest National Scenic Trail without a special-use authorization (36§ 261.20 Pacific Crest National Scenic Trail; [49 FR 25450, June 21, 1984. Re-designated at 70 FR 68291, Nov. 9, 2005]). All action alternatives identify the Pacific Crest National Scenic Trail as not-designated for OSV use. The Forest Service recognizes that through-use on the Pacific Crest National Scenic Trail is minimal and that use conflicts have not been reported. Nonetheless, some through use has occurred and various directives and regulations suggest that protections of the Pacific Crest National Scenic Trail beyond the trail tread itself are warranted. Therefore, the Forest Service is also analyzing for the potential effects of non-designated areas along both sides of the trail itself. Alternatives 2 and 5 provide for an area not designated for OSV use that would extend 500 feet from either side of the trail. Alternatives 3 and 4 do not include this area of non-designation. The Pacific Crest National Scenic Trail Comprehensive Management Plan (1982) affirms that snowmobiling along the trail is prohibited by the National Trails System Act and motorized use of adjacent land should be zoned to mitigate the noise of conflict. Guidelines for designated crossing frequencies are based on the recreation opportunity spectrum. Management of National Scenic Trails (NST) provide for the conservation and enjoyment of significant scenic, historic, natural, or cultural qualities. Other uses along the trail, which will not substantially interfere with the nature and purposes of the trail, may be permitted. Reasonable efforts shall be made to provide sufficient access opportunities to such trails and, to the extent practicable, efforts shall be made to avoid activities incompatible with the purposes for which such trails were established. (National Trails System Act, P.L. 90-543) (Executive Order 13195, "Trails for the 21st Century).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	125-4, 126-3, 171-3, 187-6, 197-3, 218-2, 226-9, 465-1, 465-3: Comments assert that there should be no restriction in operating OSVs near the Pacific Crest Trail and no restrictions as to where OSVs can cross the Pacific Crest Trail. Comments typically assert that no non-motorized use of the PCT is observed during the winter, or that non-motorized users typically use OSV tracks to aid their access to other areas. (continued)	Protecting the national scenic trails and the high priority potential sites and segments of national historic trails to the degrees necessary ensures that the values for which each trail was established remain intact. The Forest Service recognizes that there is no regulatory requirement for a specified distance of non-designation from the trail tread. However, some examples and suggestions exist. The Appalachian National Scenic Trail minimum corridor is defined in forest plans as 500 feet of centerline. There is no prescribed distance for a minimum width of an area not designated for OSV use in legislation or existing forest plans. The Pacific Crest Trail Association has also requested an area not designated for OSV use with a width of 500 feet on either side of the Pacific Crest National Scenic Trail. Under the current alternatives the Forest Service is analyzing for non-designated areas between 0 and 500 feet from the Pacific Crest National Scenic Trail tread. This will help the Forest Service consider what distance, if any, is needed to minimize potential conflicts between OSV use and other recreational uses.
Recreation	196-4a: Not designating OSV use within 500' on each side of the trail is the minimum distance required to meet the existing management direction. An example of this can be found with the Appalachian National Scenic Trail (AT). On the AT in the Green and White Mountain National Forests, snowmobile use is prohibited up to one-half mile on either side of the trail, with a minimum prohibition of 500 feet in some areas. Forest Service Manual 2350, which specifically addresses the agency's responsibility for managing National Scenic Trails as more than just a 24 or 36 inch trail tread, provides more management direction. The Manual states on page 29, "Administer National Scenic and National Historic Trail corridors to be compatible with the nature and purposes of the corresponding trail." FSM 2353.42 (emphasis added). This straightforward language found in the manual directs the agency to manage the area around each National Scenic Trail as an integral part of the trail. In essence the entire corridor is the 'trail'. Importantly, the idea of managing	196-4a-e: The comment elaborates on areas of agreement and disagreement with various alternatives as they relate to specific features (such as the Pacific Crest National Scenic Trail) or areas designated for OSV use. The modified proposed action and alternative 5 would not designate OSV use immediately adjacent to the PCT. Although the RDEIS did not designate OSV trails across the PCT in alternatives 3 and 4, we added designated trails across the PCT from alternative 2 to alternatives 3 and 4 in the Revised FEIS to be consistent with law and to allow connectivity between designated areas and trailheads. Each of these issues raised in the comment are being addressed by one or more of the alternatives currently being analyzed for this document. The comment also raises concerns regarding the size of the designated areas, observations of limited snowfall in some locations and the presence of terrain that is “not conducive” to OSV use. The travel regulations at 36 CFR §212.1 define an area as "A discrete, specifically delineated space that is smaller, and, except for over-snow vehicle use, in most cases much smaller, than a Ranger District." The areas identified in each alternative meet this definition and were developed to take advantage of existing administrative boundaries, major roads and highways and other features

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	196-4a (continued) National Scenic Trails as corridors is an essential part of the 1968 National Trails System Act. Section 7 (a) (2) of the Act states, "Pursuant to section 5(a), the appropriate Secretary shall select the rights-of-way for national scenic and national historic trails and shall publish notice thereof of the availability of appropriate maps or descriptions in the Federal Register… The location and width of such rights-of-way across Federal lands under the jurisdiction of another Federal agency shall be by agreement between the head of that agency and the appropriate Secretary. In selecting rights-of-way for trail purposes, the Secretary shall obtain the advice and assistance of the States, local governments, private organizations, and landowners and land users concerned." The term "rights-of way" does not simply refer to the trail tread and its ability to pass through areas. "Rights-of-way" as used in the Act is synonymous with the term corridor. It is for the reasons cited above in the Manual and National Trails System Act that 500' is the minimum area on both sides of the trail that OSV use should not be designated. Alternatives 3 and 4 propose OSV use areas immediately adjacent to the PCT and do not propose designated crossings of the trail. These two alternatives do not meet the PCT's legislative intent, existing policy, or management direction. The RDEIS affirms this point, as it states on page 57 (e-page 101), "In order to provide for the nature and purposes of the Pacific Crest National Scenic Trail, including the legislative requirement for the trail to be non-motorized, designated crossings are required to prevent motorized use along the trail. The Comprehensive Plan for the Pacific Crest National Scenic Trail recommends that we identify and designate public OSV crossings for this trail." As a result, Comment strongly opposes both alternatives 3 and 4, or including any part of these two alternatives, specifically regarding the treatment of the PCT, in the final chosen alternative or in the record of decision. As not designating OSV use within 500' of the PCT is the minimum required to protect the PCT and the non-motorized experience the trail is intended to provide, Comment strongly advocates for Alternative 5, to provide for the best possible management for the PCT.	196-4a-e (continued) that could be readily identified on the ground. See figure 4 in the EIS. As pointed out in the RDEIS, the Forest Service has limited or no reports of use conflicts or resource damage in almost three decades of monitoring OSV and non-motorized use during the winter. Areas of particular concern for specific resources are already identified as not designated for OSV use. Rather than arbitrarily defining small areas of designated OSV use, the Forest Service has sought to limit the areas not designated for OSV use or areas where OSV use would be restricted to trails in those areas where issues have been identified.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	251-3b: Comment expresses concern about what appears to be an arbitrary 1,000 ft. non-OSV buffer that has been created and is, in fact, more restrictive than congressionally designated Wilderness. If Wilderness areas don't have buffers, why does the PCT?	251-3b: Wilderness areas do not require non-motorized buffer outside of the Wilderness boundaries. The area “not designated” for OSV use immediately adjacent to the Pacific Crest Trail in alternatives 2 and 5 addresses the 2005 Travel Management Regulation's minimization criteria requirements for travel. Since this is a travel management planning process, there is no additional land management direction associated with it. Future forest planning efforts would comply with FSH 1909.12 and would provide for the nature and purposes of the trail by also considering access, cultural and historic resources, recreational settings, scenic character, and valid existing rights. See 629-50. Sec 7(c) of the National Trails System Act prohibits motorized use along national scenic trails. This is codified in 36 CFR §261.20 Pacific Crest National Scenic Trail; [49 FR 25450, June 21, 1984. Re-designated at 70 FR 68291, Nov. 9, 2005]). To comply with this law and regulation, all action alternatives identify the Pacific Crest National Scenic Trail as not-designated for OSV use. The National Trails System Act in Sec.7(j) applies to the entire national trails system composed of national recreation, scenic, and historic trails. The Act outlines a list of motorized and non-motorized potential uses that may be allowed. While motorized use may be allowed on national recreation and national historic trails, it does not override the prohibition found in Section 7(c) on national scenic trails. The 2005 Travel Management Regulations direct that minimization criteria consider potential resource and use conflicts.
Recreation	196-2: Comment supports the agency's recognition of Congressional intent for management of the Pacific Crest Trail.	196-2: Thank you for your comment.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	196-4b: Comment would be supportive of the development of a new alternative, as long as that alternative were to incorporate the aspects of the specific OSV areas addressed below that pose impacts to the PCT. Alternative 2—Modified Proposed Action, proposes eight distinct OSV areas across the Forest. The PCT is located in five of the eight OSV areas, and 28 designated PCT crossing locations are proposed. Alternative 5 proposes six distinct OSV areas and the PCT travels through three of the six OSV areas, and there are 12 proposed designated PCT crossings. Some of these distinct OSV areas are not particularly conducive to OSV use due to lack of snow accumulation or contain low elevation areas with a very short snow season. As a result, alternative 5 provides better management for the PCT and reflects areas that are less than ideal for OSV use. Below is Comment's comments on each individual OSV area.	196-4b: See response to concern # 196-4a.
Recreation	196-4c: Swain Mountain OSV Area—The RDEIS describes this area, "Swain Mountain OSV Area - The size of this area ranges from a minimum of 108,140 acres to a maximum of 172,210 acres, depending on the alternative. It is located east and south of Highway 44 and north of Highway 36, with the remaining boundaries formed by Lassen Volcanic National Park and the Caribou Wilderness. This area is extremely popular with OSV users, especially in the eastern and southeastern portions of the area." Comment does not take issue with this area, however, a smaller boundary for the area is more realistic and would provide greater protection for the PCT. The boundary proposed in Alternative 2 allows OSV use across the PCT and virtually to the town of Old Station. The boundary proposed in Alterative 5 does not overlap the PCT or span to the edge of Old Station. Additionally, the area close to Old Station is lower elevation, does not receive significant snow fall, and is less desirable for OSV use. As such, Comment urges the Forest to adopt the boundary proposed in Alternative 5 which better meets the management direction for the PCT.	196-4c: See response to concern # 196-4a.
Recreation	206-1: Comment asserts that although OSVs cross the Pacific Crest Trail, there is so much snow on it that there are no impacts, and furthermore the PCT gets very little use in the winter.	206-1: The Forest Service is analyzing alternatives for their potential effects, including three that would designate areas or trails below 3,500 feet. This analysis will serve to inform the decision.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	208-5a: All OSV recreation west of the PCT becomes impacted if crossing the PCT is prohibited or severely limited. Because the map is so small, it's difficult to locate the crossings. The implementation of "crossing points" creates the following problems: · Who will be responsible for putting up and maintaining the signage for the "crossing points"? Signage will have to start over ½ mile away from the crossings. When the snow depth approaches ten feet or more, will the signs locating designated crossings of the PCT be visible? · Snow depth can vary along the PCT trail. If one or more of the "designated crossing points" are closed to snowmobile traffic, who will make this decision and how will the OSV Community be notified? Will alternate crossing trails be allowed? · At high elevations, winds and weather can cause the snow to shift from one place to another, and the probability of a "designated PCT crossing(s)" will be closed by the "snow depth rule" or soil exposure. Snowmobile traffic will have to find another "designated crossing" which will cause additional travel, confusion, and congestion at an alternate crossing. · By creating "designated PCT crossings" and a one-mile buffer zone along the PCT will cause snowmobilers' to "look" for the "crossing point" which will result in unnecessary parallel riding and frustration. · The possibility of accidents must be addressed. Safety is the number one priority. · The OSV Community has been crossing the PCT for many years and no disruption of the PCT has been documented. · Attempting to regulate PCT high elevation open country crossings with "signs" and enforcement is unmanageable, especially in several feet of snow.	208-5a, 225-3, 231-5, 234-2, 239-4: The comment raises a number of potential issues, mostly concerning designation of trails proposed for crossing the PCT and potential problems associated with that. All designated trails across the Pacific Crest National Scenic Trail would overlie National Forest System roads (see alternative descriptions in Revised FEIS, chapter 2) and should be readily identifiable under most conditions, either visually or through GPS tracking. All trails designated to cross the PCT would overlie roads identified on the current Forest Service winter recreation map and would be identified in any subsequent OSV use map developed. However, the Forest Service recognizes that, under some extreme snowfall conditions, it may be impossible to accurately identify designated trails across the PCT. The Comprehensive Plan for the Pacific Crest National Scenic Trail provides for the establishment of crossings for OSVs. Page 17 of the Comprehensive Plan states, "snowmobiling on the [Pacific Crest] trail is prohibited but crossing at designated locations is consistent with the purpose of the trail when such use is permitted on lands adjacent to the trail and does not cause damage to the trail, related resources, or facilities."

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	208-5a (continued) Eliminating "Choke Points" where OSV riders are trying to get across the PCT at the same crossing thus reducing the possibility of soil disturbance. · Open crossing of the PCT will reduce fuel consumption and travel because crossing the PCT is easily accessible. · A human hiking exerts 5 pounds per square inch of pressure on the soil, an OSV exerts 1/2 pound per square inch of pressure on the soil, plus at least 12 inches of snow will provide a "barrier" between the OSV and the soil.	
Recreation	208-5b: All OSV recreation west of the PCT becomes impacted if crossing the PCT is prohibited or severely limited. Because the map is so small, it's difficult to locate the crossings. The implementation of "crossing points" creates the following problems: · The concern about soil disturbance during low snow levels on the PCT is mitigated by the low snow levels at the staging areas, thus no OSV travel. · Crossing the PCT by the OSV Community during the winter months was never a problem, now all of a sudden it is an issue. Why? · Maintain Open OSV travel across the PCT at right angles. · Crossing the PCT safely is our number one priority.	208-5b: See response to concern #208-5a.
Recreation	225-3: Proposing PCT "crossings" in the winter time is dangerous. With snow conditions changing on a daily basis, designating crossing locations can create extreme liability for those users who try to use a crossing that has changing snow conditions. This is not a common sense ruling. With the admitted very small amount of folks who use the PCT in the winter, and the lack of documented negative interactions, we believe this corridor is unnecessary. Additionally, some locations of the PCT are difficult to find in summertime dry conditions. It is almost impossible to determine where the PCT is in the winter time with snow on the ground. The Pacific Crest Trail Association website even discourages users from traveling the PCT in the winter, stating: "The PCT was not designed for travel when snow is on the ground."	225-3: See response to concern #208-5a

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	231-5, 234-2, 239-4: Comments are concerned about the ability of OSV users to locate either the trail buffers or specific crossings, depending upon conditions. Comments also contend that enforcement of these prohibitions will be difficult at best.	231-5, 234-2, 239-4: See response to concern #208-5a
Recreation	233-2, 250-10: Comment disputes the agency's ability to mark Pacific Crest Trail crossings for OSVs. The specific location of crossings is likely to shift with changing snow conditions.	233-2, 250-10: All designated trails across the Pacific Crest National Scenic Trail would overlie National Forest System roads (see alternative descriptions in Revised FEIS, chapter 2), should be readily identifiable under most conditions and could also be located by GPS. Therefore, they would be recognizable to OSV enthusiasts.
Recreation	251-3a: Comment asks for clarification. There are several elements which appear confusing and beg clarity. In particular, it is unclear to what extent Alternative 4, and other alternatives, would allow for continuing OSV crossings of the Pacific Crest Trail (PCT). It seems possible to read the document to eliminate such crossings and create a 500 foot "buffer" on each side of the PCT. See, RDEIS at Page 159. Yet on Page 147, the RDEIS states, "The same PCT crossings as in alternative 2 [28 designated PCT crossings] would be designated. OSV use would be allowed adjacent to the PCT. The trail itself would remain non-motorized. indiscriminant	251-3a: Thank you for your comment the FEIS has been updated to clarify Alternative 4. Furthermore, all action alternatives would designate OSV trails across the Pacific Crest Trail. This was misstated in the RDEIS. The Revised Final EIS will include the correct information. The use of motorized vehicles by the general public along the Pacific Crest Trail is prohibited by Section 7(c) of the National Trails System Act. However, allowing indiscriminate OSV crossing of the PCT in an area that may be used by non-motorized enthusiasts would conflict with the Travel Management Regulations' direction that the responsible official consider conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands, with the objective of minimizing these conflicts. The proposal for continuous or indiscriminate OSV crossing of the PCT is not feasible and fails to meet the purpose and need, because it runs contrary to relevant law, regulation and policy. Although the RDEIS did not include trails across the PCT in alternative 4, we added designated trails across the PCT from alternative 2 to alternative 4 in the Revised FEIS to be consistent with law and to allow connectivity between designated areas and trailheads.
Recreation	251-3c: Comment asks the Forest Service to review public comments and internal reviews with field OSV staff and patrol agents to ensure that it designates PCT crossings that retain the current form and function of the OSV program. Depending on snow depth, it can be virtually impossible for users and law enforcement to identify specific and narrow crossings.	251-3c: All designated trails across the Pacific Crest National Scenic Trail would overlie National Forest System roads (see alternative descriptions in Revised FEIS, chapter 2), should be readily identifiable under most conditions and could also be located by GPS. Therefore, they would be recognizable to OSV enthusiasts.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	629-4, 629-45, 629-52, 629-73: Comment is opposed to the designation of any corridor around the PCT. Comments suggest that such a designation would be a direct violation of the National Trails System Act and would be difficult to enforce. Comments further assert that such a corridor designation "would directly contravene the clear direction of the NTSA, as the NTSA requires the trail to function in harmony with multiple use mandates of public lands under FLPMA".	629-4, 629-45, 629-52, 629-73: We are analyzing one alternative in detail (alternative 2) that is as similar as possible to current management while still being consistent with laws, regulations, and policies. National Forest System lands are to be managed for multiple use as required by the Multiple Use Sustained Yield Act and the National Forest Management Act. However, neither of these acts require all of the multiple uses to occur on every acre of the National Forest System. Not every possible use on the list of multiple uses is intended to occur on every acre of the National Forest System at the same time.
Recreation	629-55: Comment does not agree with implementing a limited number of OSV crossings of the PCT and recommends instead that a large number of crossings be considered.	629-55: All designated trails across the Pacific Crest National Scenic Trail would overlie National Forest System roads (Revised FEIS, Chapter 2) and should be readily identifiable under most conditions, either visually or through GPS tracking. All designated trails across the PCT would be located on existing roads identified on the current Forest winter recreation map and would be identified in any subsequent OSV map developed. However, the Forest Service recognizes that, under some extreme snowfall conditions, it may be impossible to accurately identify designated trails across the PCT.
Recreation	629-58: Comment asserts the designation of crossings across the Pacific Crest Trail for snowmobiles directly contravenes the concept of a non-motorized corridor completely surrounding the Pacific Crest Trail.	629-58: The National Trails System Act (Sec. 7c) prohibits motorized use along national scenic trails. In order to provide a continuous route from Mexico to Canada (south to north), the Pacific Crest National Scenic Trail must cross highways and other roads (east to west) that are intersecting the trail. A non-motorized area completely surrounding the trail is not legally mandated nor feasible. The Comprehensive Plan for the Pacific Crest National Scenic Trail provides for the establishment of crossings for OSVs. Page 17 of the Comprehensive Plan states, "snowmobiling on the [Pacific Crest] trail is prohibited but crossing at designated locations is consistent with the purpose of the trail when such use is permitted on lands adjacent to the trail and does not cause damage to the trail, related resources, or facilities."
Recreation	629-59: Comment is concerned that the concept of a motorized crossing is not defined in the PCT and recommends that crossings be defined on a large scale in open winter riding areas.	629-59: All designated trails across the Pacific Crest National Scenic Trail would overlie National Forest System roads (Revised FEIS, Chapter 2) and should be readily identifiable under most conditions, either visually or through GPS tracking. All OSV trails designated to cross the PCT are located on existing roads identified on the current Forest winter recreation map and would be identified in any subsequent OSV map developed. However, the Forest Service recognizes that, under some extreme snowfall conditions, it may be impossible to accurately identify designated trails across the PCT. The comment that broad crossings should occur in areas where OSV use is most likely addressed by designating OSV trails across the Pacific Crest National Scenic Trail on trails that overlie National Forest System roads.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	C/R #5 (General Pacific Crest National Scenic Trail Concerns): Comments request a 1/4-mile corridor on either side of the Pacific Crest Trail except for designated OSV crossings. Furthermore, the crossings should not be within 1/2-mile of each other.	C/R #5 (General Pacific Crest National Scenic Trail Concerns): There is no prescribed distance for a minimum width of an area along the Pacific Crest National Scenic Trail not designated for OSV use in legislation or existing forest plans. However, we use 500 feet following the practice of other national scenic trails (e.g., the Appalachian National Scenic Trail). None of the proposed designated OSV trails across the Pacific Crest National Scenic Trail are within a half-mile of each other.
Recreation	247-28: Comment asks the agency to consider a long-distance OSV opportunity similar to the long-distance non-motorized opportunity offered by the Pacific Crest Trail.	247-28: All alternatives analyzed in detail would consider large systems of both groomed trails and ungroomed trail opportunities. The Forest Service will use the results of this analysis to inform the decision.
Recreation	225-7: Comment asserts that there should be a definition of what the agency means by "resource damage."	225-7: Thank you for your comment. The Forest Service has provided a definition of resource damage Revised FEIS (see "Definitions" section in Chapter 1).
Recreation	250-9b: In addition to snow depth standards, we believe emphasis should be placed on developing a clear and concise definition of OSV resource damage, educating motorized winter recreation visitors on ways to reduce resource damage, and enforcing infractions where resource damage occurs. A Winter Recreation Advisory Council could be convened to provide input to the Lassen National Forest on a framework for describing thresholds of conditions to allow access to OSV trails, suggestions to improve management, and dates for closing OSV trails and areas. California OHV fees could be used to fund the advisory council, snow depth monitoring, resource damage education and enforcement.	250-9b: Thank you for your comment. The Forest Service is considering variations in snow depth among the five alternatives. These vary from no designated minimum snow depth to 12 inches minimum snow depth for both trail and cross-country travel. We understand that snow depth varies considerably and is a very difficult characteristic to measure consistently across the forest. Our decision will reflect a minimum depth that is supported by staff expertise and/or any available data and that best protects natural and cultural resources and forest infrastructure. Observations based on staff experience, conversations with OSV enthusiasts and experience from other national forests also support our assumption that OSV enthusiasts will not typically operate their machines on limited snow. Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12 inches depth). Measurements only at staging areas provides a biased assessment of overall snow depth across the forest as these areas typically receive the most direct sunlight and lose snow at a greater rate than most other areas of the forest. Although the Forest Service may decide to manage for a given minimum snow depth in terms of opening or closing areas based on current conditions, or restricting OSV use temporarily until snow depths general meet minimum depth, observations of resource damage will be the primary enforcement tool. The Forest Service is not opposed to the concept of a Winter Recreation Advisory Council and can see benefits to such a group in providing the Forest Service with information on snow conditions and other winter recreation issues. However, development of such a group would take time and significant discussion amongst staff, winter recreation enthusiasts and others, and as such cannot be included in the current decision document.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	257-12: Comment states the RDEIS fails to define "resource damage". It would be much more manageable if snow depths were determined by the rider according to potential resource damage. Riders would not begin riding if conditions were such that they could harm their equipment or were to cause resource damage. Actual ground conditions should determine if there is adequate snow. All snow depths should be tied to potential resource damage and resource damage should be very clearly defined. The FS is actively working on climate change issues, so they acknowledge actual ground conditions will be different in the future and are not necessarily related to elevation. Therefore any elevation restriction is inappropriate and unacceptable. The elevation restriction in the DEIS has not been properly analyzed. This area of the LNF sometimes receives adequate snow, so should be open when actual ground conditions allow. When winter maps are printed information should be added to the maps describing snow depths, resource damage, and penalties.	257-12: We have developed a definition for resource damage and have included it in the Revised FEIS (see "Definitions" section in Chapter 1). We are analyzing alternatives in detail that do not include an elevation restriction on OSV use.
Recreation	254-14: Comment wants to see all Research Natural Areas closed and further suggests that some mapping errors currently show a small portion of these areas as open to OSV use.	254-14: No Research Natural Areas would be designated for OSV use under any alternative considered in detail.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	226-1b: Under alternative 4, a 12-inch minimum snow depth of un-compacted snow will be required for OSV trail grooming activities and cross-country OSV use. We believe that this 12" depth for groomed trails is unreasonable. The 12-inch minimum adequate snow depth is not a useful or enforceable standard and so should not be included in the preferred alternatives. Please make allowances for getting from trailheads to the snow. Snowmobilers will use caution in this area anyway to stop damage to their expensive snowmobiles. Allow OSV use below 3,500 feet, when there is adequate snow depth, as described above. Prohibit cross-country OSV use in the entire area from SH36 up SR89 to Lassen Volcanic National Park and across McGowan Lake Road to NFS road 31N17 with one exception: within this OSV prohibited area, designate for OSV use the trail from the intersection of 30N16 (McGowan Lake Road) and 30N16C to allow OSV use from this intersection west out to the 31N17 road. Therefore, OSV use would be restricted to only this designated OSV trail within this area. This alternative would groom the same snow trails for OSV use as the modified proposed action. This alternative acknowledges the Our position that there is no need to close areas under 3500' to OSV travel, as the minimum snow depths already effectively determines where OSV travel is appropriate.	226-1b: The minimum of 12 inches of snow for grooming is a requirement set by the State of California to avoid damage to the grooming equipment which they have funded. However, alternatives allow OSV use with less than 12 inches of snow on trails that would be groomed. Alternatives 2, 3, and 4 designate areas below 3,500 feet for OSV use when there is adequate snow. This suggestion is addressed in alternatives 2, 4, and 5, except the areas in which the 30N16 road is located would be designated for OSV use. Therefore the trails mentioned in the comment within this area would be available for OSV use but not designated.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	243-8: Comment recommends 1) No numerical snow depth restrictions; 2) No elevation restrictions; 3) No new non-motorized areas; 4) No date restrictions; 5) Designate PCT crossings to be consistent with the crossings identified for motorized use under Subpart B and current snow use; 6) No PCT buffer. · Comment also recommends 1) providing a Snow Measurement Plan and allow public comment on the plan; 2) Providing a definition of "Resource Damage." Comment observes that OSV restrictions create enforcement issues, economic issues, and management staff shortages.	243-8: Thank you for your comment. Thank you for your comment. 1. We are considering an alternative (alternative 4) that address the concerns expressed in the comment while still being consistent with laws, regulations, and policies. 2. We are considering three alternatives (alternatives 2, 3, and 4) that address the concerns expressed in the comment while still being consistent with laws, regulations, and policies. 3. We are considering two alternatives (alternatives 2 and 4) that address the concerns expressed in the comment while still being consistent with laws, regulations, and policies. 4. None of the alternatives considered in detailed impose date restrictions on the use of OSVs. 5. All designated OSV trails across the PCT are consistent with those designated under Subpart B. However, not all designated trails across the PCT under Subpart B would be designated for OSV use because the Comprehensive Plan for the Pacific Crest Trail only allows the trail to be accessed by primitive roads or motorized trail routes no more frequently than one-half mile intervals in the semi-primitive motorized ROS class (PCT Comprehensive Plan, page 18). 6. Alternatives 3 and 4 address this concern. Management of dispersed recreation (such as OSV use) is mainly accomplished through education and enforcement. Current snow depth levels will be determined through regular inspection by patrollers and groomers. Monthly grooming reports will document the depth and distribution of snowpack within designated areas and on groomed trails. Current snow depth and snow depth requirements will be available through the Lassen National Forest webpage. Snow depth stakes will be used and OSV regulations will be posted at the six plowed Sno-Park areas that access designated OSV trails and areas as an indicator and education tool for OSV users. The Over-snow Vehicle Use Map will clearly state the snow depth requirements within designated areas and on designated snow trails. We have provided a definition of resource damage in the Revised FEIS.
Recreation	208-3: Comment recommends no defined snow depth cross-country OSV travel or use of OSVs on OSV trails because OSV riders will not risk damaging their machines by riding on insufficient snow depth. Therefore, the snow depth restriction is unnecessary.	208-3: Alternative 4 would not specify a defined snow depth for cross-country OSV travel or for OSV use on trails. OSV use would be allowed in designated areas and on designated trails as long as it avoids underlying resource damage.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	225-2: Comment states that the 12" snow rule is arbitrary and has no relation to the ground conditions. Comment states there is absolutely no science behind this arbitrary number and it appears to come from an old document which discusses heavy equipment like bulldozers.	225-2: The concern expressed in the comment is addressed on page 99 of the RDEIS. The comment is correct that published, peer-reviewed data evaluating the best minimum snow depth for resource protection is not available. In multiple reviews of credible scientific data, specialists have determined there is little or no peer reviewed scientific study to support a universal snow depth for protection of multiple resources. Specialists believe this is due to differences in the snow depth to protect different resources, the variable nature of snowpack primarily based on moisture content, and differences in snowpack that occur regionally and nationally. However, U.S. Forest Service staff at the forest and district level have decades of experience managing for OSV use. OSV managers, groomers, and other specialists with field knowledge of OSV use have observed timing of OSV use, weather and snowpack patterns, and resource conditions throughout the winter season and during the summer season to develop their empirical understanding of appropriate measures needed for OSV management and for resource protection. Generally, our staff agrees, in the Sierra Nevada range, that 12 inches of snow provides adequate protection for resources in areas designated for OSV use. The comment is also correct in pointing out that the Programmatic Agreement with SHPO specifies 12 inches of snow for adequate protection of heritage resources. This reflects the general consensus that available knowledge and observations of snow depths suggests 12 inches as a minimum needed for protection. Similarly, California State grooming standards require a minimum of 12 inches of snow prior to conducting grooming operations in order to protect equipment. The broad consensus of managers with direct knowledge of on-the-ground conditions is that 12 inches of snow is a minimum standard for the protection of resources in absence of empirical evidence to the contrary.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	254-16a: Comment questions whether a 12-inch minimum snow depth for OSV operation is sufficient to prevent resource damage. Comment encourages the LNF to think about snow density as a management tool as well - perhaps a minimum snow density standard accompanied by a minimum snow depth standard.	254-16a: The Forest Service is considering variations in snow depth among the five alternatives. These vary from no designated minimum snow depth to 12 inches minimum snow depth for both trail and cross-country travel. We understand that snow depth varies considerably and is a very difficult characteristic to measure consistently across the forest. Our decision will reflect a minimum depth that is supported by staff expertise and/or any available data and that best protects natural and cultural resources and forest infrastructure. Observations based on staff experience, conversations with OSV enthusiasts and experience from other national forests also support our assumption that OSV enthusiasts will not typically operate their machines on limited snow. Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12 inches depth). Measurements only at staging areas provides a biased assessment of overall snow depth across the forest as these areas typically receive the most direct sunlight and lose snow at a greater rate than most other areas of the forest. Although the Forest Service may decide to manage for a given minimum snow depth in terms of opening or closing areas based on current conditions, or restricting OSV use temporarily until snow depths general meet minimum depth, observations of resource damage will be the primary enforcement tool. The Forest Service is not opposed to the concept of a Winter Recreation Advisory Council and can see benefits to such a group in providing the Forest Service with information on snow conditions and other winter recreation issues. However, development of such a group would take time and significant discussion amongst staff, winter recreation enthusiasts and others, and as such cannot be included in the current decision document.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	254-16b: The LNF should implement a consistent and standardized minimum snow depth of 12 inches, as described in alternative 5. To determine when this standard has been met and to let the public know when areas are open we suggest utilizing the approach described in alternative 4. The selected alternative should read "OSV use is prohibited in any area of the forest until at least 12 inches of snow has accumulated in that area. This will be determined by a combination of weather station data and observations at trailheads by staff. Seasonal opening and closing will be announced through Public Service Announcements, on information kiosks at trailheads, and via the forest website."	254-16b: The Forest Service is considering variations in snow depth among the five alternatives. These vary from no designated minimum snow depth to 12 inches minimum snow depth for both trail and cross-country travel. We understand that snow depth varies considerably and is a very difficult characteristic to measure consistently across the forest. Our decision will reflect a minimum depth that is supported by staff expertise and/or any available data and that best protects natural and cultural resources and forest infrastructure. Observations based on staff experience, conversations with OSV enthusiasts and experience from other national forests also support our assumption that OSV enthusiasts will not typically operate their machines on limited snow. Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12 inches depth). Measurements only at staging areas provides a biased assessment of overall snow depth across the forest as these areas typically receive the most direct sunlight and lose snow at a greater rate than most other areas of the forest. Although the Forest Service may decide to manage for a given minimum snow depth in terms of opening or closing areas based on current conditions, or restricting OSV use temporarily until snow depths general meet minimum depth, observations of resource damage will be the primary enforcement tool. The Forest Service is not opposed to the concept of a Winter Recreation Advisory Council and can see benefits to such a group in providing the Forest Service with information on snow conditions and other winter recreation issues. However, development of such a group would take time and significant discussion amongst staff, winter recreation enthusiasts and others, and as such cannot be included in the current decision document.
Recreation	254-16d: We do not support allowing OSV use on all designated trails with only 6 inches of snow. However, understanding that some low elevation trails can provide access to high country areas with more snow, we are open to a 6 inch minimum on those specific trails. If the LNF choses to allow OSV use on certain routes with only 6 inches of snow the Forest Service must be more specific about the conditions under which OSV travel would be allowed and the exact routes, or portions of routes, likely to require an exemption to the 12-inch minimum. In addition, the LNF should identify these routes on the OSVUM and sign on the ground any sections of trail where OSV travel is allowed on 6 inches of snow. These trails should only be those that are necessary to access higher elevation areas.	254-16d: Thank you for your comment. The Forest Service is considering variations in snow depth among the five alternatives. These vary from no designated minimum snow depth to 12 inches minimum snow depth for both trail and cross-country travel. We have further specified in some of these alternatives that the 6-inch limit is specifically for trails underlain by National Forest System roads. As indicated in the RDEIS, it is our experience that road damage due to OSV use has not been reported.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	623-20, 623-22, 623-23: Comment is concerned about various aspects of the proposed minimum snow depth restrictions in many of the alternatives. Specifically, the issue is raised about the scientific validity of the proposals and what scientific evidence there is to support snow depth restrictions. Comment further states that no minimum depth should be identified and that OSV use over snow is "self-regulating".	623-20, 623-22, 623-23: The concern expressed in the comment is addressed on page 99 of the RDEIS. The comment is correct that published, peer-reviewed data evaluating the best minimum snow depth for resource protection is not available. In multiple reviews of credible scientific data, specialists have determined there is little or no peer reviewed scientific study to support a universal snow depth for protection of multiple resources. Specialists believe this is due to differences in the snow depth to protect different resources, the variable nature of snowpack primarily based on moisture content, and differences in snowpack that occur regionally and nationally. However, U.S. Forest Service staff at the forest and district level have decades of experience managing for OSV use. OSV managers, groomers, and other specialists with field knowledge of OSV use have observed timing of OSV use, weather and snowpack patterns, and resource conditions throughout the winter season and during the summer season to develop their empirical understanding of appropriate measures needed for OSV management and for resource protection. Generally, our staff agrees, in the Sierra Nevada range, that 12 inches of snow provides adequate protection for resources in areas designated for OSV use. The comment is also correct in pointing out that the Programmatic Agreement with SHPO specifies 12 inches of snow for adequate protection of heritage resources. This reflects the general consensus that available knowledge and observations of snow depths suggests 12 inches as a minimum needed for protection. Similarly, California State grooming standards require a minimum of 12 inches of snow prior to conducting grooming operations in order to protect equipment. The broad consensus of managers with direct knowledge of on-the-ground conditions is that 12 inches of snow is a minimum standard for the protection of resources in absence of empirical evidence to the contrary.
Recreation	623-4a: Comment asserts the RDEIS still does not adequately address snow depth restrictions.	623-4a: Snow depths and the risk of resource damage from various alternatives were analyzed in the RDEIS for hydrology and soils. Credible science was used to determine effects. We acknowledge that there is a long list of variables that affect the capability of snow pack to protect the ground surface from impacts from OSVs. We analyzed a reasonable range of alternatives, representing a reasonable range of minimum snow depths in the RDEIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	623-4b: Comment states that to justify the 12 inch minimum show depth, the page 35 of the original Draft EIS stated, "Based on input from the resource specialists on our interdisciplinary team, their review of available literature, professional judgment and consultation with other agency professionals, 12 inches of snow was deemed to be the minimum depth of snow necessary to ensure adverse resource impacts from cross-country OSV use do not occur."	623-4b: The language quoted in the comment may have been included in the original DEIS but was not included in the Revised DEIS. We acknowledge that there is a long list of variables that affect the capability of snow pack to protect the ground surface from impacts from OSVs. We analyzed a reasonable range of alternatives, representing a reasonable range of minimum snow depths in the RDEIS. We analyzed a reasonable range of alternatives, representing a reasonable range of minimum snow depths in the RDEIS.
Recreation	629-11: Comment expresses the concern that often parking or trailhead facilities are located in areas where there may be minimal snowfall but exceptional recreational opportunities remain for the snowmobile community in areas that are higher and colder and may have numerous feet of snow when compared to the parking area. Comment supports the 6-inch minimum snow depth for OSV usage of roads and trails.	629-11: Thank you for your comment. Alternative 2 addresses this concern.
Recreation	629-12: Comment raises concerns of the 6" snow limit and general issues regarding potential impact from higher pressure vehicles.	629-12: The Travel Management Regulations define an over-snow vehicle as 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 (RDEIS, page 3). Many of the vehicles the comment describes are not consistent with this definition and therefore would not be subject to the designations resulting from this process. If we determine that differentiation is needed, further refinements in the designations resulting from this process will be considered in the future. If new information or changed circumstances relating to the environmental impacts of an action come to the attention of the responsible official after a decision has been made, the responsible official would review the information carefully to determine its importance. Consideration would be given to whether or not the new information or changed circumstances are within the scope and range of effects considered in the original analysis. If a correction, supplement, or revision to the environmental document is necessary, the responsible official will do so.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	629-13: Comment notes that while 6 inches of Sierra Cement (frozen ice and snow) may be more than sufficient to operate OSVs without damage to resources, the same may not be said of other vehicles that exert force 6-12 times that of an OSV.	629-13: We recognize the problems with establishing a minimum snow depth and is relying on the best science available and knowledge of our resource specialists. We understand that snow depth varies considerably and is a very difficult characteristic to measure consistently across the forest. Our decision will reflect a minimum depth that is supported by staff expertise and/or any available data and that best protects natural and cultural resources and forest infrastructure. Observations based on staff experience, conversations with OSV enthusiasts and experience from other national forests also support our assumption that OSV enthusiasts will not typically operate their machines on limited snow. Further, the Travel Management Regulations define an over-snow vehicle as 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. Any vehicles not consistent with this definition and therefore would not be subject to the designations resulting from this process. The analysis differentiates between different types of over-snow vehicles as long as they meet the definition of an OSV as stated in the regulations at 36 CFR 212.1. If we determine that differentiation is needed, further refinements in the designations resulting from this process will be considered in the future. If new information or changed circumstances relating to the environmental impacts of an action come to the attention of the responsible official after a decision has been made, the responsible official would review the information carefully to determine its importance. Consideration would be given to whether or not the new information or changed circumstances are within the scope and range of effects considered in the original analysis. If a correction, supplement, or revision to the environmental document is necessary, the responsible official will do so.
Recreation	629-8: Comment vigorously supports implementation of 6 inch minimum for OSV usage on roads and trails and 12 inches for off trail usage.	629-8: Thank you for your comment. The Forest Service is analyzing for the potential effects of snow depth restrictions that vary from no depth restriction up to 12 inches for both cross-country and trail use by OSVs.
Recreation	629-9: Comment is not able to provide any additional information regarding snow depth.	629-9: Thank you for your comment.
Recreation	C/R #10 (General Support for 12" Minimum Snow Depth Throughout the Forest): Comment states the entire forest should have a 12" minimum snow depth for OSV operation to protect the environment, protect plants and wildlife and water runoff.	C/R #10 (General Support for 12-inch Minimum Snow Depth Throughout the Forest): Thank you for your comment. Alternative 5 is one alternative that is analyzed in detail in the RDEIS and it specifies a 12-inch minimum snow depth to operate OSVs on the forest. The Revised DEIS analyzes the potential effects of this alternative.
Recreation	C/R #11 (General Support for Snow Depth Restriction): Comments express support for minimum snow depth as specified in alternative 5.	C/R #11 (General Support for Snow Depth Restriction): Thank you for your comment. The 12-inch minimum snow depth for OSV trail grooming, cross-country OSV use, and OSV use on designated trails is analyzed in detail in the RDEIS in alternative 5 (RDEIS, page 49).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	C/R #12 (General Opposition to Any Minimum Snow Depth Restriction): Comment states that there should be no minimum snow depth to operate OSVs on the Lassen National Forest.	C/R #12 (General Opposition to Any Minimum Snow Depth Restriction): Alternative 4 would not specify a defined snow depth for cross-country OSV travel or for OSV use on trails. OSV use would be allowed as long as it avoids underlying resource damage.
Recreation	250-7h: Bogard OSV Area: Prohibit OSV use in SPNM ROS Areas.	250-7h: We inadvertently designated SPNM areas for OSV use in the RDEIS. These designations are inconsistent with the forest plan. We will correct these designations in the Revised FEIS and will not designate any SPNM areas for OSV use.
Recreation	250-7p: Jonesville OSV Area: Several Semi-Primitive Non-Motorized areas are also located within the unit, these include: Soda Creek, Chips Creek, Chambers Creek, Grass Lake, Table Mountain, and Butt Mountain. · Expand Butt Mountain SPNM Area boundaries to the north and east (extend to the Lassen National Forest boundaries to match the IRA). · To protect the Chips Creek and Soda Creek drainages as Wilderness. Expand Soda Creek SPNM Area boundaries to the east (extend to the Plumas National Forest boundary to match the IRA).	250-7p: Changing ROS classification boundaries would not be within the purpose and need for this project. Wilderness areas can only be designated by Congress. We inadvertently designated SPNM areas for OSV use in the RDEIS. These designations are inconsistent with the forest plan. We will correct these designations in the Revised FEIS and will not designate any SPNM areas for OSV use.
Recreation	583-4: We support ONLY a modified Alternative 4, pursuant to the following comments: 1. We believe that the 12" un-compacted depth for grooming trails is reasonable. 2. We agree that no defined snow depth be designated for cross-country OSV travel or on designated OSV trails. 3. We do not believe OSV use be allowed with forest staff determinations through a combination of weather station data, observations at trailheads by staff, and when groomers decide conditions are right. This policy would lead to unnecessary delays in opening or resource damage occurring with delays in closing. 4. We support preventing resource damage. OSV use should be prohibited when such use causes resource damage. Clearly defining what resource damage is and informing the public on what not to do is the preferred OSV use approach.	583-4: 1. All action alternatives analyzed in detail would allow snow trail grooming when un-compacted snow is 12 or more inches deep. This is consistent with the snow-depth standard set by the State of California, which funds the grooming program. 2. Alternative 4 designates no defined snow depth for on-trail or cross-country OSV travel. 3. Management of dispersed recreation (such as OSV use) is mainly accomplished through education and enforcement. Current snow depth levels will be determined through regular inspection by patrollers and groomers. Monthly grooming reports will document the depth and distribution of snowpack within designated areas and on groomed trails. Current snow depth and snow depth requirements will be available through the Lassen National Forest webpage. Snow depth stakes and OSV regulations will be added to the six plowed Sno-Park areas that access designated OSV trails and areas as an indicator and education tool for OSV users. The Over-snow Vehicle Use Map will clearly state the snow depth requirements within designated areas and on designated snow trails. 4. We will manage OSV use to minimize resource damage and have provided a definition of resource damage in the Revised FEIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	583-4 (continued) 5. We believe seasonal opening and closing announcements or date restrictions would be unnecessary when using a prohibition of resource damage policy 6. We support allowing OSV use below 3,500 feet 7. We support the following regarding the Pacific Crest Trail ("PCT"): 7a. Agree with the Pacific Crest Trail Association that the PCT is not designed for travel when snow is on the ground. 7b. Agree with the 1982 Comprehensive Management Plan for the PCT ("CMP") assumption on page 23, "Crossing the PCT by snowmobiles would not be in conflict with the intent of congress if such use were part of a winter sports plan that permitted snowmobiles to use the land adjacent to the trail". 7c. Agree with CMP's Effects on the Management of Adjacent Public Land within Federal lands outside National Parks and Wilderness (57% of the trail) (p. 21), "the trail must co-exist in harmony with all other resource uses and activities of the land as determined through the land management planning process. The trail will cross a mosaic of areas differing in primary management emphasis. This could be grazing, key wildlife habitat, special interests, such as; scenic or geologic, developed recreation, unroaded recreation, research, natural, or intensive timber management. Viewing and understanding this array of resources and management is one of the primary recreation opportunities to be made available over these portions of trail. Some activities such as road construction, logging, prescribed burning, herbicide application, mining, etc., will require considerable informational and interpretive skills to be placed in a positive perspective from the standpoint of the user. The agencies should look at this as an opportunity to explain the multiple-use concept." 7d. Lassen National Forest's minimization measures 5 and 6 (p. 32). 7e. A balanced mix of OSV open PCT crossing areas and designated OSV crossings.	583-4 (continued) 5. No alternative analyzed in detail would include a seasonal opening and closing date restriction for the use of OSVs on the forest. OSV use would be allowed whenever show conditions are sufficient to avoid resource damage. 6. Alternatives 2, 3, and 4 are being analyzed in detail and would designate areas for OSV use below 3,500 feet.7a. The commenter's statement is out of context. The Pacific Crest National Scenic trail is intended to be managed as a year-round non-motorized trail. The comprehensive plan for the PCT states that "winter use (cross-country skiing and snowshoeing) should be accommodated where practical and feasible." 7b. We agree. However, the PCT comprehensive plan recommends regulated OSV crossing of the trail. The Pacific Crest National Scenic trail comprehensive plan states that "winter sports brochures should indicate designated snowmobile crossings on the Pacific Crest Trail where it is signed and marked for winter use if cross-country skiing and/or snowshoeing is planned for the trail." 7c. Thank you for your comment. 7d. Thank you for your comment. 7e. Thank you for your comment.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	583-4 (continued) 7f. We do not support Lassen National Forest's Minimization Measure number 4 (p. 32). Promoting the "entire" PCT for winter use by signing is not practical or safe. The Pacific Crest Trail Association warns of the dangers associated with winter use. The forest should analyze the natural dangers (i.e. avalanche and tree holes), cost and danger of rescuing users, and agreement by local public safety officials and governments who provide rescue response prior to adopting winter PCT use. The PCT CMP does not require designated snowmobile crossings unless signed and marked for use by cross-country skiing and/or snowshoeing. 7g. We seek clarity on PCT crossings and adjacent use described in Alternative 2: 8. How many miles of PCT are within the Lassen National Forest? 9. How many miles of PCT are in existing non-motorized areas? 10. How many miles of PCT are in proposed Alternative 4 non-motorized areas? 11. Where is the 97.68 of adjacent use located on map? Are crossings shown on map on county roads? If yes, we question the forest's authority on designating county roads as crossings.	583-4 (continued) 7f. The Pacific Crest Trail Association's advisories do not prohibit or preclude winter use of the trail. The Comprehensive Plan for the Pacific Crest National Scenic Trail provides for the establishment of trails across the PCT for OSVs. Page 17 of the Comprehensive Plan states, "snowmobiling on the [Pacific Crest] trail is prohibited but crossing at designated locations is consistent with the purpose of the trail when such use is permitted on lands adjacent to the trail and does not cause damage to the trail, related resources, or facilities." The non-motorized use of the PCT in the winter is already determined by law and analysis of the dangers of winter use is not within the purpose and need of this project. 7g. Please see page 33 of the RDEIS for an explanation of the restrictions around the Pacific Crest National Scenic Trail that would occur in alternative 2. 8. As stated on page 127 of the RDEIS, there are approximately 125 miles of the Pacific Crest National Scenic Trail on the Lassen National Forest. 9. As stated on page 27 of the RDEIS, approximately 98.4 miles of the Pacific Crest National Scenic Trail are currently within areas open to public OSV use on the Lassen National Forest (also see table 13, page 67 of the RDEIS); 10. Approximately 27 miles (125 minus 98.4) of the Pacific Crest National Scenic Trail would be within areas not currently open for OSV use on the Lassen National Forest. 11. As stated on page 147 of the RDEIS, areas designated for OSV use within 500 feet of the PCT would occur along 97.68 miles of the Pacific Crest National Scenic Trail on the Lassen National Forest in alternative 4. The map (figure 7) on page 47 of the RDEIS shows the 97.68 miles of the Pacific Crest National Scenic Trail that would exist within 500 feet of an area or trail that would be designated for OSV use in alternative 4. These 97.68 miles would exist where the Pacific Crest National Scenic Trail runs through areas in dark green (labeled as "National Forest System Lands Designated for OSV Use").

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	583-4 (continued) 12. We support prohibiting cross-country OSV use in the entire area from SH36 up SR89 to Lassen Volcanic National Park and across McGowan Lake Road to NFS road 31N17, with one exception: within this OSV prohibited area, designate for OSV use the trail from the intersection of 30N16 (McGowan Lake Road) and 30N16C to allow OSV use from this intersection west out to the 31N17 road. Therefore, OSV use would be restricted to only this designated OSV trail within this area. 13. This alternative would groom the same snow trails for OSV use as the modified proposed action. For future considerations, we restate the desire to see a provision for additional miles of OSV groomed trails and Non-motorized trails as funds (grant funds or budgeted funds) become available. Additionally, we would like to see additional parking areas made available for safe trailering and unloading of OSV equipment, and increased signage indicating whether the trails are shared use or restricted.	583-4 (continued) 12. This suggestion is addressed in alternatives 2, 4, and 5, except the areas in which the 30N16 road is located would be designated for OSV use. Therefore the trails mentioned in the comment within this area would be available for OSV use but not designated. 13. We would consider grooming additional miles if additional funding becomes available after conducting the appropriate environmental analysis.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	623-32: We support Alternative 4 with the following modifications: 1. Apply SAC's definition of "adequate snow" 2. Add a third classification in the analysis for ungroomed roads 3. No numerical snow depth restrictions 4. No elevation restrictions 5. No new non-motorized areas 6. Designate PCT crossings to be consistent with the crossings identified for motorized use under Subpart B The decision on this project will supplement the current Land Management Plan (LMP) and the upcoming LMP revision. This will be viewed as a positive change, if it properly reflects the needs of the rapidly growing OSV community. The Lassen NF has not yet adequately responded to our comments to the NOI, where we stated: 7. There must be no restrictions based solely on elevation. 8. It is imperative that there are an adequate range of alternatives analyzed for this project that specify no snow depth and no elevation restrictions, to ensure these issues are properly analyzed. 9. A detailed economic analysis is vital to this project and to the local communities. Coordination with local government and businesses is vital to developing the economic analysis. 10. NEPA requires a scientific analysis of the impacts to the human environment. 11. At last year's public meetings, it was stated that there would be no restrictions on crossing the Pacific Crest Trail with snowmobiles.	623-32: 1. Alternative 4 requires snow depth necessary to avoid resource damage for on-trail and cross-country OSV use. The Revised FEIS will provide a definition of resource damage. 2. None of the alternatives would designate roads for OSV use. However, snow trails that overlie roads would be designated and are listed on table 11 (beginning on page 58 of the RDEIS) 3. Alternative 4 would designate no defined snow depth for on-trail or cross-country OSV travel. 4. Alternatives 2, 3, and 4 are being analyzed in detail and would not have restrictions on OSV use based on elevation. 5. We are unable to consider an action alternative that includes no new non-motorized areas due to the need to minimize impacts. We are analyzing one alternative in detail (alternative 2) that is as similar as possible to current management while still being consistent with laws, regulations, and policies. However, as shown on table 10 (page 58 of the RDEIS), this alternative would add 1,310 acres of new non-motorized areas to the forest. 6. All designated trails across the PCT are consistent with those designated under Subpart B. However, not all trails across the PCT designated under Subpart B designated for OSV use because the PCT Comprehensive Plan requires 0.5 mile between OSV crossings. 7. Alternatives 2, 3, and 4 are being analyzed in detail and would not have restrictions on OSV use based on elevation. 8. Alternative 4 would designate no defined snow depth for on-trail or cross-country OSV travel and would not have restrictions on OSV use based on elevation. 9. The potential direct, indirect, and cumulative socioeconomic impacts of the alternatives analyzed in detail are disclosed on pages 237 through 258 of the RDEIS. 10. Thank you for your comment. 11. The Comprehensive Plan for the Pacific Crest National Scenic Trail provides for the establishment of trails across the PCT for OSVs. Page 17 of the Comprehensive Plan states, "snowmobiling on the [Pacific Crest] trail is prohibited but crossing at designated locations is consistent with the purpose of the trail when such use is permitted on lands adjacent to the trail and does not cause damage to the trail, related resources, or facilities." Cross-country skiing and snow-shoeing on the trail are compatible with the purpose of the trail (PCT Comprehensive Plan, page 17). The non-motorized use of the PCT in the winter is already allowed by law and analysis of the dangers of winter use of the PCT is not within the purpose and need of this project.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	231-8: We support Alternative 4 with the following modifications: 1. No Loss of legal OSV acre opportunity 2. Apply common sense language to the management plan for preventing resource damage without a snow depth measurement requirement 3. No numerical snow depth restrictions 4. No elevation restrictions 5. No new non-motorized areas 6. No PCT buffer zone or crossing restriction during winter snow coverage.	231-8: Thank you for your comment. Alternative 4 was submitted by a local representative of the intervenors to address the concerns of motorized interests. This plan would be consistent with law and policy and alternatives 2 and 4 would provide for the most OSV opportunity and are similar to current management (table 10 of the RDEIS). Alternative 4 would designate OSV use on 83 percent of the forest, compared to current management which allows 84 percent. The Revised FEIS will include a definition of resource damage. Alternative 4 would not apply numerical snow depth restrictions except for the depth necessary for grooming, which is specified by the State of California; and would not restrict OSV use based on elevation. However, allowing indiscriminate OSV crossing of the PCT in an area that may be used by non-motorized enthusiasts would conflict with the Travel Management Regulations' direction that the responsible official consider conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands, with the objective of minimizing these conflicts. The proposal for continuous or indiscriminate OSV crossings of the PCT is not feasible and fails to meet the purpose and need, because it runs contrary to relevant law, regulation and policy. Although the RDEIS did not designate OSV trails across the PCT in alternative 4, we added the designated trails across the PCT from alternative 2 to alternative 4 in the Revised FEIS to be consistent with law and to allow connectivity between designated areas and trailheads. Alternative 4 would address the commenter's concern by designating areas adjacent to the PCT for OSV use.
Recreation	210-1: Comment supports alternative 4 with the following exceptions. Comment has skied and snow-shoed in these areas and believe that motorized travel in the following areas would negatively detract from the experience for a non-motorized traveler if OSVs were permitted here. 1. The Fredonyer Pass Steeps near Hamilton Mountain in the area bounded by 29N46, 29N85 & 29N85F 2. The north-facing slopes of Diamond Mountain (Cabin Bowl and Basque Bowl east of the Nipple Elevation 7,399) 3. Hog Flat Reservoir 4. Colby Mountain Trail Buffer 5. Lake Almanor the west side trail buffer.	210-1, 226-1a, 226-1b, 231-2, 231-8, 235-5a, 235-5b, 583-4, 623-32: Thank you for your comments. 1. We have no reports of use conflict in the Fredonyer Pass Steeps near Hamilton Mountain and we see no issue that would cause us to not designate this area for OSV use. 2. The north-facing slopes of Diamond Mountain would be designated for OSV use in alternatives 1 through 4 in the RDEIS. Alternative 5 would not designate this area for OSV use. 3. Hog Flat Reservoir would be designated for OSV use in alternatives 1, 2, and 4 in the RDEIS. Alternatives 3 and 5 would not designate this area for OSV use. 4. An area along the Colby Mountain Trail would be designated for OSV use in alternatives 1, 2, and 4 in the RDEIS. However, alternatives 3 and 5 would not designate this area for OSV use. 5. Alternative 4 would designate an area along the Lake Almanor west-side trail OSV use.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	215-1: Comment supports a modified alternative #4. Comment does not agree with imposing any restrictions on crossing the Pacific Crest Trail nor does it agree with the 12" minimum snow depth required for travel. There would be no defined minimum snow depth in areas designated for cross-country OSV travel or on designated OSV trails in alternative 4.	215-1: The RDEIS inadvertently was unclear as to whether it would designate trails across the PCT for OSVs across the Pacific Crest National Scenic Trail. All alternatives would include designated OSV trails across the Pacific Crest National Scenic Trail (see description of the alternatives in Revised FEIS, chapter 2). Alternative 4 would address the other concerns stated in the comment.
Recreation	226-1a: Comment supports Alternative 4, with the following changes. Allow winter OSV motorized recreation use and trail grooming when un-compacted snow depths equal or exceed 12 inches. Exceptions are allowed on designated OSV trails overlaying existing paved, dirt, and gravel National Forest System roads and trails in order for OSVs to access higher terrain and legal snow levels when snow depths are less than 12 inches, as long as this use does not cause visible damage to the underlying surface.	226-1a: Alternative 5 is analyzed in detail and considers OSV use and trail grooming when un-compacted snow depths equal or exceed 12 inches. Alternative 4 is analyzed in detail designates OSV use on trails overlying existing roads and trails when snow depths are sufficient to avoid resource damage to the underlying surface. We are not analyzing an alternative that combines these two design features. However, alternative 4 would address the concern implied in the comment.
Recreation	235-5b: We support a hybrid of Alternative 4: Designate the following areas on the LNF as non-motorized: 1. Hog Flat Reservoir 2. Fredonyer Pass Steeps (Hamilton Mountain bounded by 29N46, 29N85 & 29N85F - ULA 557) 3. Diamond Mountain Ridge's north-facing slopes of Cabin Bowl and Basque Bowl east of the "Nipple" (elevation 7,399') 4. Colby Mountain Trail buffer 5. Lake Almanor west-side trail buffer Designating the above areas as non-motorized will allow skiers and snow-shoers to recreationally enjoy quieter areas on the LNF, while affording plenty of OSV use on the LNF. Maintain existing non-motorized areas as depicted on the LNF Winter Recreation Guide (2005 Project Record), such as the McGowan Lakes area and the Eagle Lake SW trail. Any further areas to be not designated for critical flora and fauna considerations should be determined by wildlife biologists and botanists	235-5b: 1. Hog Flat Reservoir would be designated for OSV use in alternatives 1, 2, and 4 in the RDEIS. Alternatives 3 and 5 would not designate this area for OSV use. 2. The Fredonyer Pass Steeps near Hamilton Mountain would be designated for OSV use in all alternatives considered in detail in the RDEIS. We will consider the recommendation expressed in the comment, determine if it applies in one or more alternatives, and if not, modify one or more alternatives with the additional minimization measures to address the concern expressed in the comment, if necessary. 3. The north-facing slopes of Diamond Mountain would be designated for OSV use in alternatives 1 through 4 in the RDEIS. Alternative 5 would not designate this area for OSV use. 4. An area along the Colby Mountain Trail would be designated for OSV use in alternatives 1, 2, and 4 in the RDEIS. However, alternatives 3 and 5 would not designate this area for OSV use. 5. Alternative 4 would designate an area along Lake Almanor near the west side trail for OSV use to facilitate recreation parking and OSV access to the OSV areas across Highway 89.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	625-2: Comment expresses support for a combination of alternatives 3 and 4. Comment requests addition of the following non-motorized areas: Hog Flat, Ridge south of Fredonyer Pass to Hamilton Mountain, Diamond mountain snow fields (also noted as scenic backdrop to Susanville). Comment requests to keep the Biz Johnson trail non-motorized and to revise mileage on Winter recreation guide to accurately reflect BLM and FS mileage of the trail. Comment notes that skiers benefit from several groomed OSV trails.	625-2: Thank you for your support of a combination of alternatives 3 and 4. The requested non-motorized areas were compared with GIS maps of each analyzed alternative. The following areas were considered as "not designated for motorized vehicle use" in one or more alternatives in the RDEIS: Hog Flat, analyzed as not designated for OSV use in alternatives 3 and 5; Diamond mountain snow fields (also noted as scenic backdrop to Susanville), analyzed as not designated for OSV use in Alternative 5; Biz Johnson trail maintains its non-motorized status in all alternatives, with the exception of two segments of groomed OSV trails that overlap the trail, this is no change from current management. The Fredonyer Pass to Hamilton Mountain area was not analyzed as an area not designated for OSV use in any alternative. This area is surrounded by groomed OSV trails, however, a majority of the OSV use occurs on the trails and little conflict with non-motorized use is anticipated in this area.
Recreation	246-15: Comment supports alternative 5 but requests the following language incorporated from alternative 4: the 12-inch minimum snow depth restriction will be implemented and enforced using a combination of weather station data, Forest Service staff judgment, and trailhead observations, with restrictions clearly posted on information kiosks at trailheads and on the forest website.	246-15: Incorporating design features from more than one alternative is an option.
Recreation	250-7ac: Swain Mountain OSV Area: The Swain Mountain OSV Area surrounds the Caribou Wilderness, several small SPNM Areas on the east and south edges of the Wilderness, and the Prospect SPNM Area on the north slopes of Prospect Peak, north of Lassen Volcanic National Park. Being located in the center of the Swain Mountain OSV Area, the Caribou Wilderness and SPNM Areas are prone to OSV trespass. · To eliminate OSV trespass in the Caribou Wilderness, apply for CA OHV funds to educate OSV visitors and monitor north, east and south Wilderness boundaries with remote sensors.	250-7ac: None of the action alternatives would designate the Caribou Wilderness or SPNM areas for OSV use.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	250-7a: Ashpan OSV Area: The Thousand Lakes Wilderness is located in the center of the Ashpan OSV Area and is prone to OSV trespass along the southern boundary. Forest Route 16 is groomed in winter, linking OSV trails on the Lassen National Forest with OSV trials in Latour State Forest. The Designated Groomed OSV Trail comes within ¼-mile of the southwest corner of the Wilderness (T32N, R3E, sec. 3). · To eliminate OSV trespass in the Thousand Lakes Wilderness, apply for CA OHV funds to educate OSV visitors and monitor the south Wilderness boundary with remote sensors. · To enhance non-motorized winter recreation opportunities, either expand the Thousand Lakes Wilderness to include the Cypress and Devil's Garden IRAs; or with the Forest Plan revision designate Cypress and Devil's Garden IRAs as SPNM Areas Recommended as Wilderness.	250-7a: None of the action alternatives would designate the Thousand Lakes Wilderness for OSV use. 1. We would use signs at trailheads to educate OSV enthusiasts about avoiding non-designated trails and areas, and avoiding areas where motorized use is prohibited by law, such as Wilderness. The OSV use map would identify those areas and trails designated for OSV use. 2. The RDEIS designates the Cypress and Devil's Garden IRAs for OSV use in all alternatives. We don't have a history of use conflict in these areas.
Recreation	444-1: Comment requests that the agency restrict all motorized and mechanical use to areas outside designated or proposed wilderness areas. Wilderness areas are out highest level of protection and should be kept as pristine as possible.	444-1: No proposed wilderness areas or trails within proposed wilderness areas would be designated for OSV use in any alternative.
Recreation	225-4: Comment requests additional facilities to provide parking and turn around areas as trailheads move with snow conditions.	225-4: As noted in the RDEIS on page 99, the Lassen Forest Plan includes the following under Standards and Guidelines: 15. Recreation: (b)(2) Cooperate with the State of California to identify locations where snow removal is needed to accommodate safe, off-highway parking for dispersed winter use. The development of new facilities such as new trailheads, new trails, or new snow-play areas are outside the scope of this project. This analysis is focused on the designation of trails and areas for OSV use. For this reason, this suggestion is not being considered for further detailed analysis in this EIS. However, we agree that facility improvements or changes may be valuable and/or necessary in the future. Comments regarding possible changes related to facilities or other specific management considerations will be useful for consideration by the decision maker for future management.
Recreation	247-10: Comment expresses concern that the proposed OSV closures significantly affects their pursuit of happiness and the quality of the human environment.	247-10: The potential direct, indirect, and cumulative impacts on the quality of the OSV recreational experience for each alternative are disclosed in the REIS (pages 130-155).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	567-1: Comment rides many different trails around the area and some of them are apparently going to be off limits to snowmobiling. These include Pacific Crest Trail, Colby Mountain Cross-country Ski Trails, McGowan Lake Cross-country Ski Trails, Biz Johnson Trail from Susanville to Westwood Junction, Lake Almanor Recreation Trail, and Eagle Lake Trail. All these trails help tie other areas and trails together making it one of the best snowmobiling areas around.	567-1: Thank you for your comment. Many of the trails mentioned in the comment are currently not designated for OSV use. As stated in the RDEIS, no trails that are currently closed to OSV use would be designated for OSV use under any action alternative (RDEIS, chapter 2 alternative descriptions).
Recreation	582-5: Comment is disappointed to see that the LNF has refused to consider the imposition of restrictions based on vehicle type, such as closing areas to BAT vehicles. Yellowstone National Park has very successfully pioneered the use of BAT restrictions to enhance user experience and protect wild environments, and I continue to urge the National Forests to consider such a restriction as one of the best ways to reduce conflict and maximize user experience for the greatest number of users.	582-5: OSV enthusiast activity on the Lassen National Forest is not substantial enough to warrant BAT requirements (RDEIS, page 98). See the Recreation Report in the project record. This use of this technology is likely to increase without the Forest Service having to require it as older OSVs are retired from use.
Recreation	629-60: Comment asserts that amending the PCT plan as part of the OSV plan would resolve a number of issues regarding the PCT, particularly in reference to designation of a limited number of crossings.	629-60: Amending the Pacific Crest National Scenic Trail Comprehensive Plan is outside the scope of the current project. However, as with all public input, the Forest Service can consider this for future application.
Recreation	250-9c: We recommend establishing permanent snow transects with at least 5 snow depth monitoring locations at each OSV staging area. The average snow depth could be used to determine the snow depth at the staging area. We agree that OSV use should "be allowed only when conditions are sufficient to allow OSV use while protecting underlying resources."	250-9c: Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12 inches depth). Management of dispersed recreation (such as OSV use) is mainly accomplished through education and enforcement. Current snow depth levels will be determined through regular inspection by patrollers and groomers. Monthly grooming reports will document the depth and distribution of snowpack within open areas and on groomed trails. Current snow depth and snow depth requirements will be available through the Lassen National Forest webpage. Snow depth stakes and OSV regulations will be added to the six plowed Sno-Park areas that access designated OSV trails and areas as an indicator and education tool for OSV users. The Over-snow Vehicle Use Map will clearly state the snow depth requirements within designated areas and on designated snow trails. Although the Forest Service may decide to manage for a given minimum snow depth in terms of opening or closing areas based on current conditions, or restricting OSV use temporarily until snow depths general meet minimum depth, observations of resource damage will be the primary enforcement tool.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	226-2: Comment requests future consideration of additional miles of OSV groomed trails and non-motorized trails as funds become available. Comment also requests additional parking areas and increased signage indicating whether the trails are shared use or restricted.	226-2: OSV trail grooming opportunities are subject to an external constraint due to limits on the amount of funding from the State of California for grooming snow trails for public OSV use (RDEIS, page 106). Snow trail grooming for OSV use on NFS land is 100 percent State-funded. The State's financial support of snow trail grooming for OSV use is not expected to increase. Therefore, there are no plans to increase the amount of snow trail grooming on the Lassen National Forest. However, if the State's financial support increases in the future, we would consider grooming additional trails. As noted in the RDEIS on page 99, the Lassen Forest Plan includes the following under Standards and Guidelines: 15. Recreation: (b)(2) Cooperate with the State of California to identify locations where snow removal is needed to accommodate safe, off-highway parking for dispersed winter use. The development of new facilities such as new trailheads, new trails, or new snow-play areas are outside the scope of this project. This analysis is focused on the designation of trails and areas for OSV use. For this reason, this suggestion is not being considered for further detailed analysis in this EIS. However, we agree that facility improvements or changes may be valuable and/or necessary in the future. Comments regarding possible changes related to facilities or other specific management considerations will be useful for consideration by the decision maker for future management. The use of signing at trailheads and along trails is an ongoing management practice on the Lassen National Forest and will continue to be updated as needed.
Recreation	246-6: Comment asserts the monitoring plan lacks specificity. Comment expresses concern that the monitoring is uncertain, lacks triggers to identify potential impacts in time to avoid them, is unenforceable, and would not be effective in minimizing impacts.	246-6: The monitoring plan will be completed prior to implementation and will address these concerns to be effective in minimizing impacts. The monitoring plan will be enforceable. Monitoring will continue to occur as it is implemented currently, and include the ongoing monitoring required by the State in its support of the Forest Service's trail grooming program.
Recreation	582-6a: Comment states that most land currently closed to motorized use is located far from winter trailheads and thus does not provide meaningful recreation opportunity for those desiring quiet recreation and solitude. The comment continues that these lands cannot be reached by non-motorized users in a day. "Although the LNF has attempted to address this issue by quantifying accessible lands within 10 miles of plowed trailheads, 10 miles is too far. The great preponderance of winter non-motorized users travel less than 3 miles from the trailhead, and being able to reach a non-motorized area at the end of a half day's travel does little to satisfy a user seeking to recreate in a non-motorized environment."	582-6a: We have modified the analysis to reduce the radius of a daily non-motorized trip from a plowed trailhead. We'll assume a radius of 5 miles from plowed trailheads. This is more representative of a typical non-motorized day trip (5 miles out and 5 miles back).

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	254-5: Comment asks why areas not "conducive to OSV" use are designated for OSV use. Why does the agency differentiate between an area or trail that is conducive to OSV use and an area or trail that is designated for OSV use?	254-5: The Forest Service did not intend to suggest that these areas are not conducive to OSV use, only that OSV use is in such areas is typically low for a variety of reasons such as terrain or dense vegetation. Areas or potential trails of particular concern for specific resources are already identified as not designated for OSV use in one or more of the alternatives. Rather than arbitrarily define areas not designated for OSV use, t the Forest Service has sought to limit the areas not designated for OSV use or areas where OSV use would be restricted to trails to those areas where issues have been identified. We will make that change in the FEIS.
Recreation	246-13: Comment questions the measurement of areas that are non-motorized under existing law or policy and calculation of areas designated for OSV use in inventoried roadless areas in alternative 5. Comment asserts that the analysis under Alternative 5 of "areas designated non-motorized under existing law or policy" is missing.	246-13: The purpose of this analysis is to designate areas and trails for OSV use. The travel regulations do not require the analysis of areas not designated for OSV use.
Recreation	247-13: Comment asserts that the analysis does not adequately consider cumulative impacts of all motorized closures.	247-13: Thank you for your comment. The Revised FEIS includes analysis of all relevant and useful actions for cumulative impacts of designating trails and areas for OSV use. In order for cumulative impacts to exist, direct and indirect impacts of the designations would have to exist.
Recreation	623-14: Comment states that the analysis did not include the positive effects of OSV to the environment such as use of groomed trails and OSV tracks that are used by wildlife and skiers.	623-14: Analysis in the RDEIS was based on the assumption that motorized OSV use is concentrated on groomed OSV trails, thus reducing the potential for impacts to various resources off of the trails. This was captured in the OSV assumptions map (see page 95 and maps in Appendix G of the RDEIS) showing areas where high, moderate, and low to no OSV use is anticipated. The recreation section of the RDEIS will be reviewed and benefits of OSV use, or relevant literature will be added as necessary.
Recreation	247-14: Comment states that the RDIS fails to address the imbalance of trail opportunities between motorized and non-motorized uses on the Lassen National Forest.	247-14: The Lassen National Forest Plan includes the following goals for recreation: (a) Provide a wide range of outdoor recreation opportunities to meet public demand by furnishing different levels of access, service, facilities, and information. (d). Provide diverse opportunities for winter sports (RDEIS, page 99). The multiple use mission of the Forest Service does not mandate the provision of equal opportunities for each use group, instead the Forest Service strives to provide a range of opportunities across the landscape. The acres designated for OSV use and the acres not designated for OSV use are included in the analysis of each alternative. Additionally, each alternative considers varying amounts of acreage designated for OSV use. This analysis does not specifically consider the total miles of non-motorized trails across the forest because the purpose of this analysis is to designate trails and areas for motorized OSV use. The availability of areas for quiet, non-motorized recreation within 10 miles of plowed trailheads is compared in the recreation section for each alternative.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	247-19: Comment states that the analysis is and the decision would be arbitrary and capricious. There are no data or studies to support reducing motorized opportunities. Studies that support OSV recreation are ignored. Impacts on fish and wildlife are being assumed (imagined) without adequate site specific data and studies. Impacts on the natural environment are being assumed (imagined) without adequate site specific data and studies. The Agency is creating and using bogus issues to justify the closure of valuable motorized access and motorized recreational opportunities.	247-19: OSVs have been operated in the Lassen National Forest on existing identified OSV trails and in existing identified OSV areas for decades with no record of impacts to forest resources or use conflicts specifically attributed to OSV use. In the last five years, approximately 100 cultural resource sites have been impacted by OHV use. Some if these impacts may be from OSV use, but our monitoring does not differentiate between OHV and OSV impacts. We completed an Environmental Assessment of OSV use on the Lassen National Forest in 1989. That Environmental Assessment identified areas of potential adverse impacts to natural and cultural resources, and we did not establish OSV trails in the areas where these resources would be adversely affected. Furthermore, we know other forests have recorded resource damage and use conflicts and we have law enforcement reports of inadvertent OSV incursions into areas where OSV use is prohibited, such as Wilderness. For the current designation process, utilizing minimization criteria, we identified some areas where potential adverse impacts or use conflicts might be possible and minimized those effects where they have the potential to occur.
Recreation	247-22: Comment states the RDEIS overstates the Impact of Motorized Access and Motorized Recreation on the Natural Environment. The analysis has not adequately considered data and studies that supports an unbiased and balanced view of how motorized recreation impacts the natural environment. The analysis does not have adequate site specific data and studies. Impacts from all users groups and natural impacts must be adequately compared to demonstrate a true sense of magnitude for impacts. Alternatives to wholesale motorized closures that would mitigate natural environment concerns were not given a hard look.	247-22: OSVs have been operated in the Lassen National Forest on existing identified OSV trails and in existing identified OSV areas for decades with no record of impacts to forest resources or use conflicts specifically attributed to OSV use. In the last five years, approximately 100 cultural resource sites have been impacted by OHV use. Some if these impacts may be from OSV use, but our monitoring does not differentiate between OHV and OSV impacts. We completed an Environmental Assessment of OSV use on the Lassen National Forest in 1989. That Environmental Assessment identified areas of potential adverse impacts to natural and cultural resources, and we did not establish OSV trails in the areas where these resources would be adversely affected. Furthermore, we know other forests have recorded resource damage and use conflicts and we have law enforcement reports of inadvertent OSV incursions into areas where OSV use is prohibited, such as Wilderness. For the current designation process, utilizing minimization criteria, we identified some areas where potential adverse impacts or use conflicts might be possible and minimized those effects where they have the potential to occur.
Recreation	247-31c: Comment asserts the Forest Service has not considered the fact that no OSV use is allowed in Lassen Volcanic National Park in weighing a fair balance between motorized and non-motorized uses.	247-31c: The Forest Service, with input from the public, has developed alternatives that are consistent with and achieve the purposes of the Forest Service Travel Management Regulations at 36 CFR part 212, Subpart C. This includes balancing the needs of motorized and non-motorized recreation as well as protecting natural and cultural resources.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	583-10: Comment states the RDEIS fails to mention one exceedingly important consideration for open, non-motorized winter recreation, which is that the entire area of Lassen National Park, which is over 106,000 acres, and is located in the center of the Lassen National Forest, is closed to OSV travel but is open for other, non-motorized recreationists to enjoy the quiet, wilderness winter experience.	583-10: Lassen Volcanic National Park is addressed as follows in the RDEIS: The forest completely surrounds Lassen Volcanic National Park, and the 10,457-foot Lassen Peak is a prominent feature that visitors view from many national forest locations. Proximity to the national park and a variety of access points from the forest increase visitors' opportunities for quiet recreation (RDEIS, page 112), and, The 106,372-acre Lassen Volcanic National Park (LVNP) is located near the center of the Lassen National Forest. A variety of winter non-motorized activities are available in the park including cross-country skiing, telemarking, snowshoeing, and snow-play. The National Park Service (NPS) offers ranger-led snowshoe trips from the Manzanita Lake area. Throughout the winter, the park highway is plowed to the southwest parking area on the south side of the park and to the Loomis Museum on the north side of the park. Non-motorized access is allowed year-round (USDI National Park Service 2015). The nearest groomed OSV trails to the LVNP, located on the Lassen National Forest are approximately three-quarters of a mile to the east of the park's southeast corner, and approximately one and one-half miles north of the park's northwest corner (RDEIS, page 116). The proximity of motorized use to the Lassen Volcanic National Park was considered in the recreation analysis.
Recreation	623-29: Comment states there are at least 80 reports going back 40+ years (many in Yellowstone) that could not prove damage by OSV but only speculate that there could be damage. The reports show no actual damage by OSV, only the possibility of damage. That is not science. That is speculation with no data to support it. Programs beginning in the 1970s were designed to report on OSV damage, but there has been no significant impact in over 40 years of analysis. Comment believes 40+ years is enough time to conclude that OSVs do not damage the forest ecosystems. Comment has copies of four years of "Impact of OSV" Reports sent by all the Forests in R5 to California Parks and Recreation, and there were no reports of damage. Comment asks agency to "Please respond to the fact that there has been no documentation of OSV damage for 40+ years."	623-29: Simply because we have no documentation of damage doesn't mean there isn't the potential based on the resource conditions we considered. Thus, we designed alternatives that included additional sensitive areas in which OSV use would not be designated. We acknowledge that OSVs have been operated in the Lassen National Forest on existing identified OSV trails and in existing identified OSV areas for decades with no record of impacts to forest resources or use conflicts specifically attributed to OSV use. In the last five years, approximately 100 cultural resource sites have been impacted by OHV use. Some if these impacts may be from OSV use, but our monitoring does not differentiate between OHV and OSV impacts. We completed an Environmental Assessment of OSV use on the Lassen National Forest in 1989. That Environmental Assessment identified areas of potential adverse impacts to natural and cultural resources, and we did not establish OSV trails in the areas where these resources would be adversely affected. Furthermore, we know other forests have recorded resource damage and use conflicts and we have law enforcement reports of inadvertent OSV incursions into areas where OSV use is prohibited and would not be designated for OSV use in this decision, such as Wilderness. For the current designation process, utilizing minimization criteria, we identified some areas where potential adverse impacts or use conflicts might be possible and minimized those effects where they have the potential to occur.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	208-4: Comment quotes agency conclusion (Page 34678 Federal Register / Vol. 79, No. 117 / Wednesday, June 18, 2014 / Proposed Rules) that impacts of OSVs are less compared to other types of motor vehicle use because when properly operated and managed, OSV's do not make direct contact with soil, water, and vegetation, whereas most other types of motor vehicles operate directly on the ground. OSVs traveling cross-country generally do not create a permanent trail or have a direct impact on soil and ground vegetation. Comment asks if this conclusion would be considered in the decision and if not, why not.	208-4: The agency's conclusion (Page 34678 Federal Register / Vol. 79, No. 117 / Wednesday, June 18, 2014 / Proposed Rules) will be considered in the decision.
Recreation	257-14: Comment expressed concern about how the decision would address access issues at Diamond Peak, McGowan Lake, Hamilton Mountain, and Colby Meadows.	257-14: Three alternatives consider boundaries around McGowan Lake. Alternatives address designations and non-designations at Diamond Mountain. The area of concern around Hamilton Mountain is designated for OSV use in all alternatives. Colby Mountain ski trail (a cross-country ski trail) is not designated for OSV use under any alternative; areas around the ski trail are being analyzed for both designation and non-designation for OSV use in various alternatives.
Recreation	629-41, 629-42, 629-43, 629-46, 629-63: Comment is concerned that restricting OSV use under 3500' would present significant difficulties in terms of enforcement and user education. Upgrading education materials and implementing the necessary signage would be cost prohibitive and difficult. Signage and enforcement will be challenges given changing snow conditions.	629-41, 629-42, 629-43, 629-46, 629-63: The range of alternatives includes alternatives that designate areas below 3,500 feet for OSV use.
Recreation	247-24: Funds from the gas tax should not be used on projects in areas where motorized use is not allowed	247-24: Thank you for your comment. The Forest Service does not have discretion or authority over the gas tax. The Forest Service's current snow trail grooming program on the Lassen National Forest is funded by the State of California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation (OHMVR) Division.
Recreation	629-56: Comment asserts that limiting designated crossings of the PCT would be difficult to enforce on the ground.	629-56: All designated trails across the Pacific Crest National Scenic Trail in alternatives 2 and 5 occur over National Forest System roads and should be readily identifiable under most conditions, either visually or through GPS tracking. All trails that would be designated to cross the PCT would be on roads identified on the current Forest winter recreation map and would be identified in any subsequent OSV map developed. However, the Forest Service recognizes that, under some extreme snowfall conditions, it may be impossible to accurately identify designated trails across the PCT.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	1-4: Comment suggests using a consistent 12" minimum snow depth requirement for OSV operation throughout the Forest. Using a mixture of 6" on paved roads and 12" everywhere else would be confusing and unenforceable.	1-4: Thank you for your comment. The EIS analyzes an alternative in detail (alternative 5) that requires a consistent 12 inches minimum snow depth requirement for OSV operation throughout the forest.
Recreation	231-3: Comment asserts that a 12-inch minimum snow depth would be unenforceable and a standard preventing resource damage (if defined) would be sufficient.	231-3: The EIS considers three alternatives that require a minimum of 12 inches of snow to operate an OSV cross-country. One alternative requires a snow depth necessary to avoid resource damage. The responsible official will consider the feasibility of each of these options in the decision.
Recreation	247-29a: Comment asserts the agency cannot determine if adequate snow depth for OSV use would exist and alert the public in the early morning hours when most snowmobilers are leaving for their day's ride. Only resource damage is relevant in determining adequate snow depth. Actual ground conditions should be used as the basis to protect resources.	247-29a, 247-29b, 247-30, 623-20, 623-22, 623-23: Thank you for your comment. The Forest Service is considering variations in snow depth among the five alternatives. These vary from no designated minimum snow depth to a maximum 12-inch minimum snow depth for both trail and cross-country travel. We understand that snow depth varies considerably and is a very difficult characteristic to measure consistently across the forest. Our decision will reflect a minimum depth that is supported by staff expertise and/or any available data and that best protects natural and cultural resources and forest infrastructure. Observations based on staff experience, conversations with OSV enthusiasts and experience from other national forests also support our assumption that OSV enthusiasts will not typically operate their machines on limited snow. Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12-inch depth). Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12-inch depth). Measurements only at staging areas provides a biased assessment of overall snow depth across the forest as these areas typically receive the most direct sunlight and lose snow at a greater rate than most other areas of the forest. Although the Forest Service may decide to manage for a given minimum snow depth in terms of opening or closing areas based on current conditions, or restricting OSV use temporarily until snow depths general meet minimum depth, observations of resource damage will be the primary enforcement tool.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	247-30: Comment asks that the public be given the opportunity to comment on a measurement plan for items such as: · Who will do the measurements? Snow depths vary from year to year and location to location. · How will significant variability be handled? · Where will it be measured? · What time of day will it be measured? · What aspect will be measurement location be? · How many areas will be measured? · How will the measurements be communicated to the public in a timely fashion (early morning hours) and on a daily basis, including weekends? · Will the whole forest be closed if one trailhead is less than 12" or will there be smaller areas closed? · Where will snow be measured for cross-country travel?	247-30: The Forest Service is considering variations in snow depth among the five alternatives. These vary from no designated minimum snow depth to a maximum 12-inch minimum snow depth for both trail and cross-country travel. We understand that snow depth varies considerably and is a very difficult characteristic to measure consistently across the forest. Our decision will reflect a minimum depth that is supported by staff expertise and/or any available data and that best protects natural and cultural resources and forest infrastructure. Observations based on staff experience, conversations with OSV enthusiasts and experience from other national forests also support our assumption that OSV enthusiasts will not typically operate their machines on limited snow. Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12-inch depth). Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12-inch depth). Measurements only at staging areas provides a biased assessment of overall snow depth across the forest as these areas typically receive the most direct sunlight and lose snow at a greater rate than most other areas of the forest. Although the Forest Service may decide to manage for a given minimum snow depth in terms of opening or closing areas based on current conditions, or restricting OSV use temporarily until snow depths general meet minimum depth, observations of resource damage will be the primary enforcement tool. Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12 inches depth). Management of dispersed recreation (such as OSV use) is mainly accomplished through education and enforcement. Current snow depth levels will be determined through regular inspection by patrollers and groomers. Monthly grooming reports will document the depth and distribution of snowpack within designated areas and on groomed trails.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	247-30: (continued)	247-30 (continued) Current snow depth and snow depth requirements will be available through the Lassen National Forest webpage. Snow depth stakes and OSV regulations will be added to the six plowed Sno-Park areas that access designated OSV trails and areas as an indicator and education tool for OSV users. The Over-snow Vehicle Use Map will clearly state the snow depth requirements within designated areas and on designated snow trails. Although the Forest Service may decide to manage for a given minimum snow depth in terms of opening or closing areas based on current conditions, or restricting OSV use temporarily until snow depths general meet minimum depth, observations of resource damage will be the primary enforcement tool.
Recreation	254-16c: Although the approach described in alternative 4 for assessing when snow depth is adequate and informing the public that areas are open for OSV use makes sense, the snow depth standard, or lack thereof, in alternative 4 is far too subjective to have any real teeth as a management tool. Likewise, having a dual standard, as described in alternatives 2 and 3 (12 inches except on designated routes) will be confusing for the public and seems difficult for the LNF to enforce.	254-16c: Thank you for your comment. The EIS analyzes an alternative in detail (alternative 5) that imposes a uniform snow depth standard for all OSV use.
Recreation	40-4: Concern is expressed as to how the Forest Service would measure the minimum snow depth to allow OSVs to operate.	40-4: Thank you for your comment. The Forest Service is considering variations in snow depth among the five alternatives. These vary from no designated minimum snow depth to 12 inches minimum snow depth for both trail and cross-country travel. We understand that snow depth varies considerably and is a very difficult characteristic to measure consistently across the forest. Our decision will reflect a minimum depth that is supported by staff expertise and/or any available data and that best protects natural and cultural resources and forest infrastructure. Observations based on staff experience, conversations with OSV enthusiasts and experience from other national forests also support our assumption that OSV enthusiasts will not typically operate their machines on limited snow. Measurements of snow depth will necessarily come from a variety of sources, such as field observations by staff, weather station data and commencement of grooming operations (itself limited by California State Department of Parks and Recreation to a minimum 12 inches depth). Although the Forest Service may decide to manage for a given minimum snow depth in terms of opening or closing areas based on current conditions, or restricting OSV use temporarily until snow depths general meet minimum depth, observations of resource damage will be the primary enforcement tool.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	254-16e: Our concern is that there is no way to ensure OSV users will stay on the trail, nor is there any explanation in the DEIS about how the Forest Service will inform users about where they can leave the trail if certain parts of open areas are open and others are not.	254-16e: As part of the implementation of the decision, the Forest Service will develop and provide an OSV Use Map (OSVUM) that will identify areas designated of designation and non-designation for OSV use.
Recreation	231-7: Comment asserts that the Sheriff's Office has received no documented complaints regarding use conflict. Comment points out that if this process further restricts OSV use or in fact eliminates current OSV legal riding opportunities that this process will actually enhance the possibility of user conflict; ultimately placing an undue burden, which currently does not exist, on local and federal law enforcement officers.	231-7: Thank you for your comment. The analysis of potential use conflicts is in the Recreation section of the RDEIS. The designations resulting from this analysis would minimize "conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands" (36 CFR 212.55(b)(3)).
Recreation	239-1: Comment asserts that decisions about restrictions and limitations will need to "policed" thus adding a burden on the Forest Service staff and budget.	239-1: Thank you for your comment. There are currently restrictions and limitations on OSV use in certain areas and have been for years; any additional areas or restrictions proposed are not expected to increase the workload (many would actually be beneficial by more effectively managing OSV use). The Forest Service currently conducts patrols and monitors OSV use throughout the season and there is no expectation that this would change under any alternative.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	252-1: Comment recommends the agency show the boundaries and label all existing and proposed wildernesses, semi-primitive non-motorized areas, and other "special interest" areas (such as research natural areas, national natural landmarks, etc.) that are non-motorized. The Lassen NF has several administratively-designated national recreation trails, which are non-motorized. Comment recommends displaying all these trails on the alternative maps and OSVUM. Show all OSV staging areas that access groomed or un-groomed trails on the Lassen NF, even those that are not maintained by the FS. Identify primary and secondary trailheads with different symbology. · The Bogard and East Chester OSV staging areas are primary trailheads with large paved, parking areas, kiosks and restrooms. · The Humboldt/SR 89 and Goumaz Road/SR 44 trailheads are considered secondary trailheads with parking space for a few vehicles. Please indicate all trailheads are shared use facilities, some of which have high concentrations of skiers/snow-shoers such as Goumaz Road/SR 44. · Show the end of the pavement on Gold Run Road as a secondary trailhead if Lassen County concurs. Display all county public roads as shared use winter trails when there is adequate snow depth.	252-1: Areas that are currently prohibited to OSV use, such as Wilderness areas, are already identified on the alternative maps. They are further described in Chapter 3 of the RDEIS: Affected Environment and Environmental Consequences. Non-motorized trails where OSV use is currently not allowed are also documented. The Forest Service will consider additional symbology or other means of showing these areas and features on provided maps. However, the product of this process will be an Over-Snow Vehicle Use Map (OSVUM) and this map mostly will show trails and areas designated for OSV use. Any OSV use on trails and areas other than those designated for OSV use on the OSVUM would be prohibited.
Recreation	154-3: WildEarth Guardians invitation to sign a "petition urging the Forest Service to keep winter wildlands free from the clamor of engines and better protect wildlife on the Lassen National Forest..."	154-3: Thank you for sending the advertisement.
Recreation	226-3b: The Colby Mountain area is currently managed by the Butte Meadows Hillsliders in partnership with the US Forest Service, Butte County, Plumas County, and Sierra Pacific. *The Hillsliders provide stable and cost-efficient road and trail systems. *The Hillsliders provide a wide-range of outdoor recreation opportunities to meet public demand. Provide diverse opportunities for off-highway vehicle recreation. Provide diverse opportunities for other winter sports. *The Hillsliders work in partnership with local groups, communities to expand recreational facilities, programs, and trails on both public and private land.	226-3b: Thank you for your comment.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	226-3c: To operate and manage the Jonesville Snowmobile Park the Hillsliders must coordinate with all stakeholders. Unlike other parks, the Hillsliders pay almost all of the expenses incurred at the park. This includes plowing of roads to the park, plowing the parking lot, cleaning toilets, and maintaining equipment purchased and owned by the Hillsliders. This has been going on for over 27 years with Hillsliders money and volunteers. When the original snowmobile park was set up an agreement was reached to set up groomed trails leading away from the park in one direction for snowmobilers and provide cross-country/bicycle trails in the other direction. The Hillsliders paid for all of this including the signage for the cross-country and bicycle trails. They also paid for the bridges that allow cross-country skiing and bicycle use. Motorized use is currently illegal on those trails according to the original agreement, and the cross-country and OSV communities have worked together with no conflicts.	226-3c: Thank you for your comment.
Recreation	226-3d: The Snowmobile Park has become more popular over the years and the Hillsliders have continued to manage this and make improvements. The number one usage is snowmobiling. Number two is snow-play for families. At the third spot is cross-country/snowshoeing followed by mountain biking. The Hillsliders have club members from both motorized and non-motorized sports. They are from all over the north valley and the Chester/Almanor area. The Hillsliders have managed this Snowmobile Park for all stakeholders for many years. If the current program has worked for so long it should stay the same. Almost no funds are received from Lassen National Forest for the operation of the Snowmobile Park. This park would not operate without the Hillsliders volunteers and money. Most users do not understand the effort, and coordination required by the Hillsliders to make this happen.	226-3d: None of the alternatives being analyzed in detail would affect the Hillsliders' activities.

Resource	Sample Comment Number, and Public Concern	Agency Response
Recreation	226-3e: Because of the varied and plentiful opportunities at the Jonesville LNF Snowmobile Park it is a destination area for many people from out of the area. The county and local community (Butte Meadows) benefit greatly from OSV use. All snowmobile trailheads and areas are shared use areas. Conflict is minimal. OSV users are usually educated as to which areas they can ride and stay out of the areas they know where riding is prohibited. There are very few tickets issued on this forest for non-compliance. Overnight parking is allowed at all snowmobile parking lots in the Lassen National Forest.	226-3e: Thank you for your comment.
Recreation	C/R #50 (General Support for OSV Trail Grooming): Comments express the desirability of groomed OSV trails to cross-country skiers, and that their maintenance of these OSV trails benefits both skiers and OSV enthusiasts.	C/R #50 (General Support for OSV Trail Grooming): Thank you for your comment.
Socioeconomic Concerns	247-23 and 623-31: Comment requests adequate consideration of references that support the need and value of motorized recreation.	247-23 and 623-31: The socioeconomic conditions section of the environmental impact statement uses the best available information to address the economic contributions of winter motorized recreation visitors on the Lassen National Forest to surrounding communities. The analysis notes that, "Nearly 10 percent of survey respondents indicate that they participate in snowmobiling during their trip, with 8.4 percent reporting that snowmobiling is the primary purpose of their trip." Furthermore, it reports that, "[National Visitor Use Monitoring] data indicate that a snowmobiler spends an average of $642 ($2007) on a non-local overnight trip and $74 ($2007) on a local day trip, compared to $366 ($2007) and $34 ($2007) for the same types of trips among participants of all recreation activities (White and Stynes 2010). Therefore, snowmobilers spend nearly twice what an average recreation user spends on their trip" (Lassen RDEIS, Chapter 3). The recreation section of the RDEIS will be reviewed and references will be added to the Revised FEIS as necessary.

Resource	Sample Comment Number, and Public Concern	Agency Response
Socioeconomic Concerns	583-6: The economic analysis area should be expanded to include more counties based on Hillslider's membership records.	583-6: Thank you for your comment. The economic analysis area is based on where visitors to the Lassen National Forest typically spend money associated with their trip. This area is different than the origin of Lassen National Forest visitors. The socioeconomic conditions section of the environmental impact statement describes the origin of recreation visitors to the Lassen National Forest, "The majority of forest visitors (60.2 percent) traveled fewer than 100 miles to reach the site. Nearly one-fifth of visits originated from a single zip code (96130), which covers the city of Susanville, California (USFS 2015b)" (Lassen RDEIS, Chapter 3). The Forest Service's National Visitor Use Monitoring survey asks visitors to report how much money they spent on their trip within 50 miles of the recreation site. The economic analysis focuses on counties most likely to be affected by Lassen National Forest recreation visitor spending.
Socioeconomic Concerns	C/R #32 (General Economic Comment): Over-snow recreation visitors to the Lassen National Forest contribute to local economies and the use of over-snow vehicles should not be restricted.	C/R #32 (General Economic Comment): Thank you for your comment. The socioeconomic conditions section of the environmental impact statement uses the best available information to address the economic contributions of winter recreation visitors on the Lassen National Forest to surrounding communities. The analysis notes that, "Nearly 10 percent of survey respondents indicate that they participate in snowmobiling during their trip, with 8.4 percent reporting that snowmobiling is the primary purpose of their trip." Furthermore, it reports that, "[National Visitor Use Monitoring] data indicate that a snowmobiler spends an average of $642 ($2007) on a non-local overnight trip and $74 ($2007) on a local day trip, compared to $366 ($2007) and $34 ($2007) for the same types of trips among participants of all recreation activities (White and Stynes 2010). Therefore, snowmobilers spend nearly twice what an average recreation user spends on their trip" (Lassen RDEIS, Chapter 3). The environmental impact statement evaluates a range of alternatives. All of the considered alternatives will continue to provide both motorized and non-motorized winter recreation opportunities on the Lassen National Forest. The alternatives analyzed comply with law, regulation, and policy as well as Forest Service goals to contribute to thriving communities. Public involvement opportunities were available at multiple times throughout the Lassen National Forest Over-snow Vehicle Use Designation NEPA process. Public meetings and submitted comments were considered in the development of alternatives and the analysis. Public input represented a broad range of stakeholders, including local county governments. The public involvement process is described in the environmental impact statement (Lassen RDEIS, page 15).
Soils	629-10: Comment notes the potential damage to OSVs on insufficient snowfall.	629-10: Thank you for your comment. The Forest Service has made that observation in a number of areas within the document (see Chapter 3: Recreation).

Resource	Sample Comment Number, and Public Concern	Agency Response
Soils	250-7e: Bogard OSV Area: The Blacks Mountain Experimental Forest is located in the center of the Bogard OSV Area. The Experimental Forest encompasses five Research Natural Area units comprising 521 acres of ancient Ponderosa Pine forests. · Prohibit OSV use in the Blacks Mountain Research Natural Area units. To reduce soil compaction in ancient Ponderosa Pine stands in the Blacks Mountain RNA units. Prohibit OSV use in the RNA units.	250-7e: None of the alternatives considered in detail in the RDEIS would designate the Blacks Mountain RNA for OSV use.
Soils	208-6: Comment points out that hiking exerts 10 times more pressure on the earth's surface (in pounds per square inch) than a snowmobile, providing a reference supporting this statement. Requests that this issue be considered in the EIS. Asks if X/C Skiing would be permitted in protected vegetation areas. Asks agency to analyze how much damage would be done if this is permitted in protected vegetation areas. Observes that areas that are being proposed as non-motorized areas for skiers have not had any analysis of snow depth and how skiers can damage resources.	208-6: Thank you for providing that information. The purpose of this analysis is to designate areas and trails for over-snow vehicle use as required by the travel management regulations at 36 CFR Part 212, Subpart C. Neither the executive orders nor the travel management regulations which implement them are intended to regulate non-motorized use (RDEIS, page 3).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	274-74f: The RDEIS Violates the 2004 Forest Plan Amendment by Not Proposing Den Site Buffers and LOP for Pacific Marten and Sierra Nevada Red Fox. The BE mentions that marten den sites occur in the project area (p.72), but does not reveal if these areas will be monitored, if they are expected to reused by marten, or if they will be protected by an LOP. An LOP is required by the 2004 SN Forest Plan Amendment (Standard and Guides 88 and 89) and should be included in the proposed action. For Sierra Nevada red fox, the 2004 Sierra Nevada Forest Plan Amendment requires forests to: "analyze all potential management impacts to Sierra Nevada red fox and apply a limited operating period [LOP] from January 1 to June 30 to avoid adverse impacts to potential breeding." Further, the SN Forest Plan directs forests to "Evaluate activities for a 2-year period for detections not associated with a den site." (2004 ROD p. 54). The OSV Designation project impacts to den site locations are not discussed in relation to this requirement. No alternative is offered which seeks to comply with Standard and Guide 32 for issuing an LOP on the project. The required LOP and ongoing monitoring in the project area must be included as a mandatory project design feature for all proposed alternatives.	274-74f: Minimization measures and monitoring strategies identified in the RDEIS (Volume II, appendices C and F) provide for avoidance of impacts to forest carnivores under all action alternatives, consistent with Forest Plan direction. Also, this direction is identified elsewhere in the RDEIS, under the Relevant Laws, Regulations, and Policy (Applies to All Alternatives), Sierra Nevada Forest Plan Amendment, Forest Carnivore Den Site Buffers section (pg. 456), and Wolverine and Sierra Nevada Red Fox Detections section (pg. 457).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	624-5: I appreciate the purpose and need for Alternative 5 that "recognizes non-motorized recreation experience as a significant issue. However, this significant issue does not recognize the importance of protecting quiet winter habitat and experience for forest creatures. Each species analyzed; Pacific marten, fisher and California Spotted Owl are in trouble Sierra wide and especially the LNF. Their connectivity, breeding, denning and nesting is affected by OSV use. Their habitat suffers fragmentation and decreased connectivity. Critical components for these sensitive species.	624-5: Mitigations to address the minimization criteria in the travel regulations for areas designated for OSV use are provided in the RDEIS (Volume II, appendix C). Minimization measures pertaining to forest carnivores include the following: · All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. · If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction. · Under all alternatives, detection of a Sierra Nevada red fox or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. Monitoring methods to identify effects to wildlife are described in the RDEIS (Volume II, appendix F, pgs. 139-140). Harassment of wildlife will be addressed by using the results of annual inventory and monitoring efforts for threatened, endangered, and sensitive species (northern spotted owl, California spotted owl, northern goshawk, bald eagle, red fox, etc.) to determine proximity of known nesting, roosting or den sites to designated OSV trails and potential effects to these species from OSV activity.
Wildlife	249-66: Comment recommends modified alternative or additional alternative that protects marten core areas and landscape connectivity.	249-66: The potential impacts of all alternatives on marten core areas and habitat connectivity are analyzed in the EIS. All alternatives may affect individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing for marten. "Although the potential for impacts to individuals within winter habitat ranges from 21 - 24 percent under all of the alternatives, and connectivity habitat ranges from 32 percent under alternative 5 to 40 percent under alternative 4, it is unknown if OSV use or related activities on the Lassen National Forest is negatively impacting marten using winter habitat or connectivity habitat, and the percentage of winter habitat and connectivity habitat impacted by OSV use would actually be lower considering that the concentration of OSV use is not equal across the landscape, with the highest use occurring on or within 0.5 miles of groomed routes and staging areas. Available research suggests that OHV/OSV use did not affect marten occupancy or probability of detection when overall OHV/OSV use in the study areas was low" (RDEIS, page 511). Therefore, there is no evidence that an alternative that protects marten core areas and landscape connectivity would result in different effects to marten population trends than the existing alternatives.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-4b: Comment asserts that the RDEIS considers no alternative to close existing OSV trails to protect natural resources, improve wildlife habitat or reduce conflict between motorized and non-motorized winter recreation uses. No alternative recommends limiting winter recreation in important winter use areas for Threatened, Endangered or Sensitive (TES) Species. The RDEIS did not determine where winter habitat for TES Species and OSV use overlap.	250-4b: The Forest Service is analyzing multiple alternatives that address issues of minimizing potential impact to natural resources and reducing potential use conflicts. These analyses are looking at the potential effects of OSV use on these resources under a variety of areas designated and not designated for OSV use. The results of these analyses will inform the decision.
Wildlife	C/R #18 (General Support for Alternative 4): Comment is not aware of any evidence of disturbance of the lands from OSV use. Nor is Comment aware of any evidence of changes to wildlife as a result of OSV use. If evidence does exist then it should certainly drive a discussion on which alternative to use to mitigate the negative effects. If there must be a change in how OSVs are managed on the Lassen National Forest, Comment supports alternative 4.	C/R #18 (General Support for Alternative 4): Thank you for your comment. OSVs have been operated in the Lassen National Forest on existing identified OSV trails and in existing identified OSV areas for decades with no record of impacts to forest resources or use conflicts specifically attributed to OSV use. In the last five years, approximately 100 cultural resource sites have been impacted by OHV use. Some if these impacts may be from OSV use, but our monitoring does not differentiate between OHV and OSV impacts. We completed an Environmental Assessment of OSV use on the Lassen National Forest in 1989. That Environmental Assessment identified areas of potential adverse impacts to natural and cultural resources, and we did not establish OSV trails in the areas where these resources would be adversely affected. Furthermore, we know other forests have recorded resource damage and use conflicts and we have law enforcement reports of inadvertent OSV incursions into areas where OSV use is prohibited and would not be designated for OSV use in this decision, such as Wilderness. For the current designation process, utilizing minimization criteria, we identified some areas where potential adverse impacts or use conflicts might be possible and minimized those effects where they have the potential to occur. Chapter 3 of the RDEIS discloses the potential impacts of each alternative considered in detail.
Wildlife	250-7j: Fall River OSV Area: Due to the area's low elevation it provides little opportunity for motorized winter recreation. Therefore, to maintain big game winter habitat, comment supports alternative 5.	250-7j: Thank you for your comment.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-7c: Bogard OSV Area: Sierra Nevada Red Fox *(Vulpes vulpes necator*) have been detected along Highway 44 in the vicinity of the Bogard Staging Area and south of Crater Mountain. To increase the number of Sierra Nevada red fox: 1. Link the Lassen population with populations to the north via wildlife corridors. 2. Educate winter recreation visitors about TES Species, how to ID them and report sightings, and how to respect wildlife and minimize impacts to TES Species. 3. Limit winter recreation in areas critical to the survival of red fox and other TES Species if peer-reviewed science shows suggests doing so will benefit the species.	250-7c: Although areas within and immediately surrounding clusters of Sierra Nevada red fox occurrences in the described locations are currently open to OSV use, portions of the Swain Mountain use area south of Highway 44, north of Lassen National Park and Caribou Wilderness, and approximately 4 miles west of the Bogard Trailhead are not designated for OSV use under alternative 3 or except along a designated route under alternative 5 (RDEIS, figures 6 and 9; Maps BE-58 and BE-60; Note: Map BE-58 of the RDEIS erroneously shows this area as designated for OSV use under alternative 3. This error will be corrected in the FEIS). This is expected to reduce potential disturbance to Sierra Nevada red foxes using habitats within this area in comparison to alternatives 1, 2, and 4. Alternative 5 provides additional areas north of Highway 44 within the Bogard Use Area where OSV use is not designated (RDEIS, Figure 9). In addition, minimization measures in the RDEIS (Volume II, Appendix C) prescribe the following pertaining to Sierra Nevada red fox: • All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting user group awareness of prohibitions against harassment of wildlife. • Under all alternatives, detection of a Sierra Nevada red fox or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. We will further consider the recommendation expressed in the comment, determine if it applies in one or more alternatives, and if not, modify one or more alternatives with additional minimization measures to address the concern expressed in the comment, if necessary.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-7b: Ashpan OSV Area: A core marten population exists in the Thousand Lakes wilderness. Spencer and Rustigian-Romsos (2012) modeled potential habitat and movement corridors in the Cascade and Sierra Nevada regions and recommend protecting key habitat around core marten populations in the Mount Lassen-Swain Mountain-Thousand Lakes Wilderness region. In addition, movement corridors between these areas and the west slopes of the Plumas and Lassen National Forests are prioritized for marten conservation. To maintain the Thousand Lakes Pacific marten population: 1. Provide a wildlife corridor to link the Thousand Lakes Wilderness martin population with the Lassen Park population. 2. Educate winter recreation visitors about TES Species, how to ID them and report sightings, and how to respect wildlife and minimize impacts to TES Species. 3. Reduce winter recreation intensity or restrict winter recreation in areas critical to the survival of red fox and other TES Species if peer-reviewed science shows suggests doing so will benefit the species.	250-7b: The RDEIS assessed suitable marten seasonal habitats based on modeling parameters described by Rustigian-Romsos and Spencer (2010) and identified functional areas of connectivity for marten using cost-distance and least-cost corridor models (Kirk and Zielinski 2010) (Chapter 3, pgs. 504-505). The seasonal habitat model predicted high probability of marten occurrence in Lassen National Park, the Caribou Wilderness, and the Thousand Lakes Wilderness for the winter period (RDEIS, maps BE-26 through BE-30). Analysis of connectivity also indicates a least-cost connective corridor extending from Thousand Lakes Wilderness south to Lassen National Park (RDEIS, maps BE-31 through BE-35). In addition, prominent clusters of marten occurrences are located in the Swain Mountain use area just east of the Caribou Wilderness, Morgan Summit use area just south of Lassen National Park, and in the Jonesville use area between Humboldt Peak and Castle Rocks. In analyzing models of least-cost corridor movement for marten, Spencer and Rustigian-Romsos (2012) identified roads as a variable that may affect marten movements or risks during dispersal. The roads included in the model consisted of interstate highways as well as primary, secondary, and local roads. Forest Service system roads (see figures 2, 3, and 4 in Spencer and Rustigian-Romsos 2012) or areas of varying system road densities do not appear to have warranted inclusion in the models as factors contributing to environmental resistance to marten movement in their study, nor were OSV trail systems or areas open to OSV cross-country use. In addition, Zielinksi et al. (2008) reported that OHV/OSV use did not affect marten occupancy or probability of detection in low use areas. A query of the Lassen NRIS database for the period 1992 to 2010 shows a total of 77 marten sightings within projected OSV high-use areas (i.e., within 0.5 miles of groomed trails) during the grooming period (12/26 – 03/31). This indicates that, while some effect to marten may be occurring due to OSV disturbance, individuals are not completely avoiding high-use areas. Given the information above, it is unlikely that existing groomed trail systems (designated or non-designated) and areas designated for OSV use would preclude marten movement through the least-cost corridor modeled by Spencer and Rustigian-Romsos. In addition, marten movements and dispersal is unaffected by OSVs during the late spring, summer, and fall periods outside the period of OSV use. This additional information will be included in the FEIS. Also, action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting user group awareness of prohibitions against harassment of wildlife (RDEIS, Appendix C).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	441-3b: Comment recommends limiting OSV recreation in important winter use areas for Sierra Nevada Red Fox, American Marten, or other Threatened, Endangered or Sensitive (TES) Species.	441-3b: The potential effects of each alternative considered in detail on Sierra Nevada red fox, American marten, and other Threatened, Endangered or Sensitive (TES) Species are disclosed in the RDEIS. None of the species considered would be negatively affected by any of the alternatives.
Wildlife	250-7q: Jonesville OSV Area: A core marten population occurs in the Jonesville/ Humboldt Peak area. Spencer and Rustigian-Romsos (2012) modeled potential habitat and movement corridors in the Cascade and Sierra Nevada regions and recommend protecting key habitat around core marten populations in the Mount Lassen-Swain Mountain-Thousand Lakes Wilderness region. In addition, movement corridors between these areas and the west slopes of the Plumas and Lassen National Forests are also prioritized for marten conservation. To maintain Pacific marten population size in the area: 1. Link with populations to the north via wildlife corridors. 2. Limit winter recreation activities if peer review science shows conflict between uses. 3. Educate winter recreation visitors about TES Species, how to ID them and report sightings, and how to respect wildlife and minimize impacts to TES Species. 4. Reduce winter recreation intensity or restrict winter recreation in areas critical to the survival of red fox and other TES Species if peer-reviewed science shows suggests doing so will benefit the species.	250-7q: The RDEIS assessed suitable marten seasonal habitats based on modeling parameters described by Rustigian-Romsos and Spencer (2010) and identified functional areas of connectivity for marten using cost-distance and least-cost corridor models (Kirk and Zielinski 2010) (Chapter 3, pgs. 504-505). The seasonal habitat model predicted high probability of marten occurrence in Lassen National Park, the Caribou Wilderness, and the Thousand Lakes Wilderness for the winter period (RDEIS, maps BE-26 through BE-30). Analysis of connectivity also indicates a least-cost connective corridor extending from Thousand Lakes Wilderness south to Lassen National Park (RDEIS, maps BE-31 through BE-35). In addition, prominent clusters of marten occurrences are located in the Swain Mountain use area just east of the Caribou Wilderness, Morgan Summit use area just south of Lassen National Park, and in the Jonesville use area between Humboldt Peak and Castle Rocks. In analyzing models of least-cost corridor movement for marten, Spencer and Rustigian-Romsos (2012) identified roads as a variable that may affect marten movements or risks during dispersal. The roads included in the model consisted of interstate highways as well as primary, secondary, and local roads. Forest Service system roads (see figures 2, 3, and 4 in Spencer and Rustigian-Romsos 2012) or areas of varying system road densities do not appear to have warranted inclusion in the models as factors contributing to environmental resistance to marten movement in their study, nor were OSV trail systems or areas open to OSV cross-country use. In addition, Zielinksi et al. (2008) reported that OHV/OSV use did not affect marten occupancy or probability of detection in low use areas. A query of the Lassen NRIS database for the period 1992 to 2010 shows a total of 77 marten sightings within projected OSV high-use areas (i.e., within 0.5 miles of groomed trails) during the grooming period (12/26 – 03/31).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-7q (continued)	This indicates that, while some effect to marten may be occurring due to OSV disturbance, individuals are not completely avoiding high-use areas. Given the information above, it is unlikely that existing groomed trail systems and areas designated for OSV use would preclude marten movement through the least-cost corridor modeled by Spencer and Rustigian-Romsos. In addition, marten movements and dispersal is unaffected by OSVs during the late spring, summer, and fall periods outside the period of OSV use. This additional information will be included in the FEIS. Also, action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting user group awareness of prohibitions against harassment of wildlife (RDEIS, Appendix C).
Wildlife	250-7r: Jonesville OSV Area: Wolverine have been documented in the Soda Creek watershed. 1. Educate winter recreation visitors about TES Species, how to ID them and report sightings, and how to respect wildlife and minimize impacts to TES Species. 2. Reduce winter recreation intensity or restrict winter recreation in areas critical to the survival of red fox and other TES Species if peer-reviewed science shows suggests doing so will benefit the species.	250-7r: Information kiosks at trailheads would continue to provide information to educate winter recreation visitors about TES Species, how to ID them and report sightings, and how to respect wildlife and minimize impacts to TES species. The Forest Service incorporates education measures as best practices during implementation which are not specifically included in the impact analysis. The potential effects of each alternative considered in detail on Sierra Nevada red fox and other Threatened, Endangered or Sensitive (TES) Species are disclosed in the RDEIS. None of the species considered would be negatively affected by any of the alternatives.
Wildlife	249-62a: Comment recommends additional OSV closures in Jonesville/Humboldt Peak area, and further minimization in Morgan Summit and Jonesville use areas to minimize impacts on marten.	249-62a: The EIS discloses the analysis of multiple alternatives, including one that decreases OSV designations in the Jonesville area (alternative 5, RDEIS, page 51). The results of the analysis will inform the decision.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	254-22: None of the alternatives in this RDEIS appear to minimize impacts to other sensitive wildlife species, such as Pacific marten and Sierra Nevada red fox. As far as we can tell from the RDEIS the Forest Service did not determine where winter habitat for threatened and endangered species and the proposed OSV areas overlap. Or, if the Forest Service did complete this level of analysis, it is not apparent in the RDEIS, making it difficult for the public to ascertain how or whether any of the alternatives minimize impacts to these species or their habitat.	254-22: Mitigations to address the minimization criteria in the travel regulations for areas designated for OSV use are provided in the RDEIS (Volume II, appendix C). Minimization measures pertaining to forest carnivores include the following: · All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting use group awareness of prohibitions against harassment of wildlife. · If fisher or marten den sites were discovered and subject to potential impacts from cross-country OSV use under any alternative, we would manage the area according to forest plan direction. · Under all alternatives, detection of a Sierra Nevada red fox or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. Monitoring methods to identify effects to wildlife are described in the RDEIS (Volume II, appendix F, pgs. 139-140). Harassment of wildlife will be addressed by using the results of annual inventory and monitoring efforts for threatened, endangered, and sensitive species (northern spotted owl, California spotted owl, northern goshawk, bald eagle, red fox, etc.) to determine proximity of known nesting, roosting or den sites to designated OSV trails and potential effects to these species from OSV activity.
Wildlife	249-60: Comment: The OSV RDEIS does not fully consider or quantify the impacts of the project given these species vulnerability to human disturbance, as outlined below. Alternative 5 would improve habitat connectivity between Lassen National Park (LNP), Caribou Wilderness, and the Swain Mountain, Bogard, and Ashpan OSV use areas. These improvements may contribute to minimization of project impacts to SN red fox and marten, although the RDEIS does not show the process by which impacts were minimized, or if this effect was intentional.	249-60: The analysis utilized cost-distance and least-cost corridor modeling (Kirk and Zielinski 2010) to estimate project effects on marten habitat connectivity and provides a comparison of effects to connectivity by alternative (RDEIS, Chapter 3, pgs. 509-510, Table 162). Additional discussion of effects to forest carnivore connectivity habitat between known use areas and areas such as Lassen National Park and designated wilderness areas will be included in the Revised FEIS. Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-76: The RDEIS lists two indicators of project impact on wildlife for purposes of applying the minimization criteria. First, "would area contain habitat for marten, wolverine, or other sensitive forest carnivores?" and then, "would OSV use cause this harassment?" (p.8-9). However, the effects analysis does not appear to have addressed these questions. Furthermore, the scale at which the RDEIS considers project impacts to wildlife is also problematic. The agency must show how project impacts at different scales have been considered and minimized by, for instance, excluding important habitat from open area designations. Finally, the BE focuses on avoiding population-level impacts, but this does not show compliance with the minimization criteria, particularly where the population is so imperiled that impacts to individuals pose a significant threat.	249-76: The Resource Indicator for assessment of effects to Sierra Nevada red fox addresses the magnitude of risk for disturbance, injury, mortality and denning habitat compaction at the project level scale for comparison of alternatives (RDEIS, Chapter 3, pg. 543). Included in these metrics are such factors as areas overlapping Sierra Nevada red fox habitat that are either designated or not designated for OSV cross-country use as well as designated areas that receive low OSV use. Additional analysis that discusses the difference among alternatives concerning disturbance magnitude within areas of known use will be included in the Revised FEIS. Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2).
Wildlife	249-61: Comment: Alternative 5 also increases OSV closures in the Jonesville Use Area/ Humboldt Peak area, an area of great importance to marten both locally and regionally (Moriarty 2015; Spencer and Rustigan-Romsos 2012). However, the USFS continues to claim minimization occurred, without showing the analysis or taking the required hard look at impacts to these imperiled species. The agency overlooked the importance of connectivity between the Thousand Lakes wilderness and the Lassen National Park for marten (Id.).	249-61: Application of, and consistency with, management direction to minimize the four categories of impacts set forth in 36 CFR §212.55(b)(1)-(4) when designating trails and areas for motorized use is discussed in the RDEIS (Vol. I, Chapter 1, pgs. 5-10; Vol. II, appendices B, C, and F). The analysis utilized cost-distance and least-cost corridor modeling (Kirk and Zielinski 2010) to estimate project effects on marten habitat connectivity and provides a comparison of effects to connectivity by alternative (RDEIS, Chapter 3, pgs. 509-510, Table 162). Additional discussion of effects to marten connectivity habitat between known use areas and areas such as Lassen National Park and designated wilderness areas will be included in the Revised FEIS.
Wildlife	249-62b: Comment asserts the agency did not consider minimizing OSV impacts in important connectivity habitat between Morgan Summit and Jonesville Use Areas, which are important for red fox (Perrine 2005).	249-62b: We are unaware of any recent Sierra Nevada red fox observations within the Jonesville use area. Survey locations described by Perrine (2005, figures 12 and 13) show a number of American marten occurrences, but no positive observations of red fox generated within that portion of the Lassen National Forest. A query of NRIS wildlife observations for the forest does show 2 historical observations, but no known recent use in the Jonesville use area.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-64: RDEIS Does Not Adequately Analyze or Demonstrate Minimization of Impacts to Marten Habitat and Habitat Connectivity Corridors. Comparing acres of marten habitat (winter, spring, denning, etc.) impacted in each OSV use area would give the public and the decision maker a more detailed understanding of project impacts to marten. This approach might also allow the LNF to focus on which areas have the biggest impact to marten, such as Jonesville and Swain Mountain, with the aim of demonstrating how impacts were minimized, as required.	249-64: The RDEIS discloses the comparable effects to marten connective habitat (Chapter 3: pgs. 505, 509-510; tables 160, 162) and marten winter habitat (pgs. 508-509, table 161) among the alternatives at the project area scale. Additional analysis of effects by alternative in known marten concentration areas (similar to the analysis for Pacific fisher in the RDEIS) which includes portions of the Jonesville, Morgan Summit, and Swain Mountain use areas, will be included in the Revised FEIS. Pertaining to application of minimization for marten, see Response to Comment #254-22.
Wildlife	249-75: Comment states the USFS does not minimize impacts to wildlife resources, as required by Executive Order 11644. The RDEIS has not demonstrated that impacts to critically imperiled forest carnivores were minimized. This does not comply with direction set forth under Executive Order 11644: "Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats." (EO 11644, Sec. 3(a); 36 C.F.R. § 212.55(b)).	249-75: Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2).
Wildlife	314-2, 350-2, 411-3, 439-6, 514-4, 546-3: Comments state that none of the alternatives in this RDEIS appear to minimize impacts to other sensitive wildlife species, such as pine marten, wolf, Pacific marten and Sierra Nevada red fox, or other Threatened, Endangered or Sensitive (TES) Species. As far as we can tell from the RDEIS the Forest Service did not determine where winter habitat for threatened and endangered species and the proposed OSV areas overlap. Or, if the Forest Service did complete this level of analysis, it is not apparent in the RDEIS, making it difficult for the public to ascertain how or whether any of the alternatives minimize impacts to these species or their habitat.	314-2, 350-2, 411-3, 439-6, 546-3: Application of, and consistency with, management direction to minimize the four categories of impacts set forth in 36 CFR §212.55(b)(1)-(4) when designating trails and areas for motorized use is discussed in the RDEIS (Vol. I, Chapter 1, pgs. 5-10; Vol. II, appendices B, C, and F). Potential overlap of OSV use areas with species presence and habitats during the period of OSV is discussed for all applicable TES species in the RDEIS (Chapter 3; appendices B and C). American marten and mule deer winter habitats are identified in the RDEIS (Chapter 3, Maps BE11-15, BE26-30).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-7w: Morgan Summit OSV Area: Sierra Nevada Red Fox have been detected in the Morgan Summit OSV Area northwest of Chester and along highway 89 southwest of Lassen Volcanic National Park. To increase number of Sierra Nevada Red Fox: 1. Link the Lassen population with populations to the north via wildlife corridors. 2. Limit winter recreation if peer-reviewed science shows conflict. 3. Educate winter recreation visitors about TES Species, how to ID them and report sightings, and how to respect wildlife and minimize impacts to TES Species. 4. Reduce winter recreation intensity or restrict winter recreation in areas critical to the survival of red fox and other TES Species if peer-reviewed science shows suggests doing so will benefit the species.	250-7w: Although areas within and immediately surrounding clusters of Sierra Nevada red fox occurrences near Morgan Summit and along Highway 89 are designated for OSV use, portions of the Morgan Summit use area within 1-2 miles of the southwestern portion of Lassen National Park are not designated as designated for OSV use under any alternative (RDEIS, maps BE-56 through BE-60). Radio-telemetry results reported by Perrine (2005, figures 26-36) indicate that Sierra Nevada red foxes were successfully utilizing this area for travel between the Morgan Summit area and Lassen National Park, and as winter seasonal range (including use overlap in areas designated for OSV use) from 1998-2002. Within portions of this area not designated for open OSV use there is reduced potential for disturbance to Sierra Nevada red foxes. In addition, minimization measures in the RDEIS (Volume II, Appendix C) prescribe the following pertaining to Sierra Nevada red fox: • All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting user group awareness of prohibitions against harassment of wildlife. • Under all alternatives, detection of a Sierra Nevada red fox or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction. We will further consider the recommendation expressed in the comment, determine if it applies in one or more alternatives, and if not, modify one or more alternatives with additional minimization measures to address the concern expressed in the comment, if necessary.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-7x: Morgan Summit OSV Area: American marten have been detected in the Morgan Summit OSV Area. To maintain Pacific marten population size in the area: 1. Link with populations to the north via wildlife corridors. 2. Limit winter recreation activities if peer-reviewed science shows conflict. 3. Educate winter recreation visitors about TES Species, how to ID them and report sightings, and how to respect wildlife and minimize impacts to TES Species. 4. Reduce winter recreation intensity or restrict winter recreation in areas critical to the survival of red fox and other TES Species if peer-reviewed science shows suggests doing so will benefit the species.	250-7x: The RDEIS assessed suitable marten seasonal habitats based on modeling parameters described by Rustigian-Romsos and Spencer (2010) and identified functional areas of connectivity for marten using cost-distance and least-cost corridor models (Kirk and Zielinski 2010) (Chapter 3, pgs. 504-505). The seasonal habitat model predicted high probability of marten occurrence in Lassen National Park, the Caribou Wilderness, and the Thousand Lakes Wilderness for the winter period (RDEIS, maps BE-26 through BE-30). Analysis of connectivity also indicates a least-cost connective corridor extending from Thousand Lakes Wilderness south to Lassen National Park (RDEIS, maps BE-31 through BE-35). In addition, prominent clusters of marten occurrences are located in the Swain Mountain use area just east of the Caribou Wilderness, Morgan Summit use area just south of Lassen National Park, and in the Jonesville use area between Humboldt Peak and Castle Rocks. In analyzing models of least-cost corridor movement for marten, Spencer and Rustigian-Romsos (2012) identified roads as a variable that may affect marten movements or risks during dispersal. The roads included in the model consisted of interstate highways as well as primary, secondary, and local roads. Forest Service system roads (see figures 2, 3, and 4 in Spencer and Rustigian-Romsos 2012) or areas of varying system road densities do not appear to have warranted inclusion in the models as factors contributing to environmental resistance to marten movement in their study, nor were OSV trail systems or areas open to OSV cross-country use. In addition, Zielinksi et al. (2008) reported that OHV/OSV use did not affect marten occupancy or probability of detection in low use areas. A query of the Lassen NRIS database for the period 1992 to 2010 shows a total of 77 marten sightings within projected OSV high-use areas (i.e., within 0.5 miles of groomed trails) during the grooming period (12/26 – 03/31). This indicates that, while some effect to marten may be occurring due to OSV disturbance, individuals are not completely avoiding high-use areas. Given the information above, it is unlikely that existing groomed trail systems (designated or non-designated) and areas designated for OSV areas preclude marten movement through the least-cost corridor modeled by Spencer and Rustigian-Romsos. In addition, marten movements and dispersal is unaffected by OSVs during the late spring, summer, and fall periods outside the period of OSV use. This additional information will be included in the FEIS. Also, action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting user group awareness of prohibitions against harassment of wildlife (RDEIS, Appendix C).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	441-3a: Comment supports limiting OSV recreation in key deer winter range.	441-3a: Thank you for your comment. Alternative 5 addresses the comment.
Wildlife	250-7af: Swain Mountain OSV Area: Studies of Sierra Nevada fed fox and American marten show that they frequent the Swain Mountain OSV Area in winter. Winter studies of Sierra Nevada red fox have detected them in the vicinity of Butte Lake in Lassen National Park and throughout the Swain Mountain OSV Area. To increase number of Sierra Nevada red fox: 1. Link the Lassen population with populations to the north via wildlife corridors. 2. Educate winter visitors about TES Species, how to ID and report sightings, and to respect wildlife and reduce impacts to wildlife. 3. Limit winter recreation if peer-reviewed science shows conflict.	250-7af: Portions of the Lassen National Forest with known Sierra Nevada red fox occurrences immediately north of occurrences at Butte Lake in Lassen National Park are designated as open to OSV under alternatives 1, 2, and 4, but are not designated for OSV use under alternatives 3 and 5 (RDEIS, maps BE-56 through BE-60; Note: Map BE-58 of the RDEIS erroneously shows this area as designated for OSV use under alternative 3. This error will be corrected in the FEIS). This is expected to preclude potential disturbance to Sierra Nevada red foxes using habitats within this area. In addition, minimization measures in the RDEIS (Volume II, Appendix C) prescribe the following pertaining to Sierra Nevada red fox: • All action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting user group awareness of prohibitions against harassment of wildlife. • Under all alternatives, detection of a Sierra Nevada red fox or wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-7ag: Swain Mountain OSV Area: A core marten population occurs in the Swain Mountain area. Spencer and Rustigian-Romsos (2012) modeled potential habitat and movement corridors in the Cascade and Sierra Nevada regions and recommend protecting key habitat around core marten populations in the Mount Lassen-Swain Mountain-Thousand Lakes Wilderness region. In addition, movement corridors between these areas and the west slopes of the Plumas and Lassen National Forests are prioritized for marten conservation. To maintain the population of Pacific marten: 1. Link the Swain Mountain population with populations in Lassen National Park, Jonesville / Humboldt, and Thousand Lakes: 2. Educate winter recreation visitors about TES Species, how to ID them and report sightings, and how to respect wildlife and minimize impacts to TES Species. Reduce winter recreation intensity or restrict winter recreation in areas critical to the survival of red fox and other TES Species if peer-reviewed science shows suggests doing so will benefit the species.	250-7ag: The RDEIS assessed suitable marten seasonal habitats based on modeling parameters described by Rustigian-Romsos and Spencer (2010) and identified functional areas of connectivity for marten using cost-distance and least-cost corridor models (Kirk and Zielinski 2010) (Chapter 3, pgs. 504-505). The seasonal habitat model predicted high probability of marten occurrence in Lassen National Park, the Caribou Wilderness, and the Thousand Lakes Wilderness for the winter period (RDEIS, maps BE-26 through BE-30). Analysis of connectivity also indicates a least-cost connective corridor extending from Thousand Lakes Wilderness south to Lassen National Park (RDEIS, maps BE-31 through BE-35). In addition, prominent clusters of marten occurrences are located in the Swain Mountain use area just east of the Caribou Wilderness, Morgan Summit use area just south of Lassen National Park, and in the Jonesville use area between Humboldt Peak and Castle Rocks. In analyzing models of least-cost corridor movement for marten, Spencer and Rustigian-Romsos (2012) identified roads as a variable that may affect marten movements or risks during dispersal. The roads included in the model consisted of interstate highways as well as primary, secondary, and local roads. Forest Service system roads (see figures 2, 3, and 4 in Spencer and Rustigian-Romsos 2012) or areas of varying system road densities do not appear to have warranted inclusion in the models as factors contributing to environmental resistance to marten movement in their study, nor were OSV trail systems or areas open to OSV cross-country use. In addition, Zielinksi et al. (2008) reported that OHV/OSV use did not affect marten occupancy or probability of detection in low use areas. A query of the Lassen NRIS database for the period 1992 to 2010 shows a total of 77 marten sightings within projected OSV high-use areas (i.e., within 0.5 miles of groomed trails) during the grooming period (12/26 – 03/31). This indicates that, while some effect to marten may be occurring due to OSV disturbance, individuals are not completely avoiding high-use areas. Given the information above, it is unlikely that existing groomed trail systems and areas designated for OSV use would preclude marten movement through the least-cost corridor modeled by Spencer and Rustigian-Romsos. In addition, marten movements and dispersal is unaffected by OSVs during the late spring, summer, and fall periods outside the period of OSV use. This additional information will be included in the FEIS. Also, action alternatives would monitor for adverse impacts to sensitive carnivores from cross-country OSV use. If monitoring determines adverse impacts of cross-country OSV use to sensitive carnivores, in all action alternatives, proposed mitigations would include posting educational materials, trail signage, and promoting user group awareness of prohibitions against harassment of wildlife (RDEIS, Appendix C).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-14: Comment appears to suggest including explicit language in the Lassen OSV FEIS stating if peer-reviewed research shows winter recreation use negatively impacts any TES Species or their habitat that winter use be restricted from areas critical to their survival.	250-14: If new information or changed circumstances relating to the environmental impacts of an action come to the attention of the responsible official after a decision has been made, the responsible official would review the information carefully to determine its importance. Consideration would be given to whether or not the new information or changed circumstances are within the scope and range of effects considered in the original analysis. If a correction, supplement, or revision to the environmental document is necessary, the responsible official will do so.
Wildlife	249-7a: Impacts to Other Imperiled Species Have Not Been Adequately Analyzed or Minimized Fisher- The fisher is characterized as a species that avoids humans (Douglas and Strickland 1987; Powell 1993). They occur on 245,220 acres of the Lassen NF, including den sites (RDEIS p.500). Their denning season starts in March and overlaps with the proposed OSV use season. Between 41% and 65% of occupied fisher habitat is proposed for exposure to OSV disturbance (Ibid). Close to half of the occupied habitat is proposed for OSV use under Alternative 5 and two thirds are proposed under Alternative 2. The Forest should explain how minimization led to this outcome.	249-7a: Although Douglas and Strickland (1987) and Powell (1993) (as summarized in Powell 1994) characterize fisher as a species that avoids humans, available science indicates that fishers' tolerance of human presence and various activities appears to range from little effect resulting from moderate degrees of human activities to avoidance and displacement if disturbance occurs near den sites (RDEIS, Chapter 3, pg. 498). Additional science that demonstrates this range of tolerance will be included in the Revised FEIS. The RDEIS (Chapter 3, pg. 499) describes that suitable fisher habitat on the Lassen National Forest totals 156,606 acres. On pg. 499, the RDEIS explains that, within those 156,606 acres of suitable habitat, the proportion of habitats designated but would receive low OSV use range from 22 percent (alternative 5) to 28 percent (alternative 2). The acreages by alternative are provided in Table 158. The percentages described will be included in Table 158 in the Revised FEIS to better clarify this. The RDEIS (Chapter 3, pg. 500) also describes that the dominant proportion of fisher occurrences are concentrated within a total of 8 watersheds which contain approximately 245,220 acres of land administered by the Lassen National Forest. While the discussion and Table 159 describe and display percentages of this total area designated for OSV use by alternative (42 percent-64 percent), the discussion and display of acreage and percentages of suitable fisher habitat overlapping areas designated of low OSV use by alternative (estimated to range from 16 percent to 22 percent) within the concentrated fisher occurrence area was lacking. This additional information will be included in the Revised FEIS. Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-11b: Climate change is another threat to Sierra Nevada red fox, as it will result in a loss or restriction of their boreal environment due to reduced snowpack.	250-11b: The potential impacts to Sierra Nevada red fox resulting from climate change are discussed in the RDEIS (Chapter 3, pgs. 539, 542-545). However, elements contained in the science provided in Comment #249-8 (i.e., Moriarty 2014; Moriarty et al. 2015; Baltensperger et al. 2017; Manlick et al. 2017; Zielinski et al. 2017) concerning potential impacts to Pacific marten and Sierra Nevada red fox resulting from interactions between predicted climate change and OSV use will be included in the Revised FEIS.
Wildlife	249-3: The Sierra Nevada red fox has been suspected of declining for decades (White 1977; Perrine 2010; Sacks et al. 2010). The Southern Cascades Distinct Population Segment (DPS), which includes Sierra Nevada red fox in the Lassen area subpopulation, as well as animals scattered across the Cascades in Oregon, is estimated to have an effective population size of only 21 individuals, the IUCN definition of a critically endangered population (Sacks et al. 2010). The subpopulation "comprise a small, isolated remnant population that has lost much of its genetic diversity." (Perrine 2010). The small, isolated nature of this subpopulation is considered a "moderate threat" to the Cascades DPS by the USFWS (2015a). Further, recreation is identified as a risk factor to this fox because of its intolerance of humans (Buskirk and Zielinski 2003). This species is so rare that less is known about it. The 2010 Sierra Nevada red fox Conservation Assessment addressed this issue: "…the general lack of basic ecological information for this species makes the identification and analysis of threats a largely speculative exercise, and ultimately poses a risk to the effective management of the Sierra Nevada red fox and its habitat." (Perrine 2010, p.29). Sierra Nevada red fox have been documented in the Morgan Summit area; around Swain Mountain, between Lassen National Park and Highway 44; and in the Humbug Summit area, where dispersing fox was recorded on camera in 2013 (USFWS 2015a).	249-3, 249-72, 250-11(a): Available science addressing response of Sierra Nevada red fox to human presence and disturbance is somewhat mixed. Buskirk and Zielinski (2003) state that "The Sierra Nevada red fox has been considered extremely sensitive to the presence of humans (Grinnell et al. 1937) so that increased recreation within its range could be problematic." Since Grinnell et al. (1937), more recent science indicates that Sierra Nevada red fox may not be extremely sensitive to human presence. For example, Perrine et al. (2010, pg. 28) state that "Risks from recreation are primarily associated with developments such as ski areas, snow parks, campgrounds, and picnic areas. In campgrounds without bear boxes, where campers' food and trash are more accessible, red foxes can develop begging habits and thereby increase the possibility for conflict with humans. Begging foxes have been a periodic problem in Lassen Volcanic National Park and the adjacent Lassen National Forest (Perrine and Arnold 2001; Perrine 2005)." Perrine (2005) reported that Lassen red foxes were closely associated with roads, parking lots (including snowmobile parks) and campgrounds during both summer and winter, but responses of individual foxes to human recreation sites varied from one individual that scavenged at a recreation site only at night to several individuals that were characterized as bold and often approached humans and vehicles during the day.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-69: The USFS Reliance on the USFWS 12-Month Finding for Listing Sierra Nevada Red Fox on the Endangered Species Act is Entirely Inadequate for a Project Impact Analysis. The USFS fails to provide a project-level analysis of vehicle impacts on the Sierra Nevada red fox by referring to the 2015 USFWS Sierra Nevada red fox 12-month finding. The agency repeatedly inserts general language such as vehicles are a "low level stressor" for the population (BE p.110), and the impact of vehicle collisions on Sierra Nevada red fox "results in a low-level impact to the subspecies" (BE p.110). A determination from the US Fish and Wildlife Service that vehicle strikes do not pose a high impact to the subspecies does not serve as a proxy for disclosing vehicle impacts at the project-level.	249-69: Additional discussion of risk to Sierra Nevada red fox resulting from OSV collisions in the context of the project area scale will be included in the Revised FEIS.
Wildlife	249-71: The Project Underestimates Impacts of Vehicle Disturbance on Sierra Nevada Red Fox. The USFS estimates that 66-83% of Sierra Nevada red fox habitat would be susceptible to OSV disturbance, and 27-32% of that area is highly conducive to OSV use, with a higher concentration of negative impacts (BE p.115). However, the location of these areas is not provided with the analysis. This forest-level summary of impacts represents a cursory view of project impacts and does not constitute a hard look according to NEPA, nor does it show how impacts were minimized in key areas such as Morgan Summit and Swain Mountain. Further, the impact of grooming activities is missing from the analysis.	249-71: The BE (pg. 115) states that 27- 32 percent of Sierra Nevada red fox suitable habitats overlap with areas that are designated and would receive moderate to high OSV use. Areas of moderate to high OSV use were defined by the following assumption criteria: canopy cover less than 70 percent, slopes less than or equal to 20 percent (BE, pg. 36). Areas of high OSV use consist of portions of areas designated for use, within 0.5 mile of OSV staging areas, groomed trails, and meadows within 0.5 mile of a designated OSV trail. Therefore, percentage of acres in high OSV use would be less than 27-32 percent. Locations of overlap between Sierra Nevada red fox suitable habitats and OSV-designated areas and areas of moderate to high OSV use, along with trail locations, are displayed in MapBE-56 through MapBE-60 of the RDEIS. These maps will be improved in the Revised FEIS to improve interpretation by showing better contrast between map features. The potential for trail grooming effects on Sierra Nevada red fox due to collisions are discussed, but the potential effects on increased predator and competitor access is lacking and will be included in the Revised FEIS. Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2).

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-72: As we stated in our March 14, 2016 letter about the DEIS, we also remain concerned with the USFS dismissal of noise disturbance to the fox. The RDEIS dismisses noise disturbance concerns for the fox because even where high OSV use overlaps with SN red fox sightings, "the SNRF that occur in the areas affected by the OSV Program during winter may be habituated to OSV disturbance…" (BE p.115). No evidence is given for this conclusion. To the contrary, carnivore experts state SN red fox are "extremely sensitive to human disturbance" (Buskirk and Zielinski 2003). The 2010 Sierra Nevada red fox Conservation Assessment addressed the fact that the Sierra Nevada red fox is a poorly studied species, necessitating a precautionary approach to management (Perrine 2010). The forest should use a more refined effects analysis of where the disturbance impact is predicted to be highest, in order to focus minimization efforts in those areas, including refining the boundaries of open areas to ensure minimization within the context of the critically endangered Southern Cascades DPS.	249-72: The RDEIS acknowledges the isolated nature and small effective population size of the Sierra Nevada red fox Southern Cascades DPS (Chapter 3, pg. 537). Buskirk and Zielinski (2003) state that "The Sierra Nevada red fox has been considered extremely sensitive to the presence of humans (Grinnell et al. 1937) so that increased recreation within its range could be problematic." Since Grinnell et al. (1937), more recent science indicates that Sierra Nevada red fox may not be extremely sensitive to human presence. For example, Perrine et al. (2010, pg. 28) state that "Risks from recreation are primarily associated with developments such as ski areas, snow parks, campgrounds, and picnic areas. In campgrounds without bear boxes, where campers' food and trash are more accessible, red foxes can develop begging habits and thereby increase the possibility for conflict with humans. Red foxes are intelligent and can quickly become acclimated to human handouts. They may be particularly susceptible in mountainous regions where natural productivity is low and winter food is scarce. Begging foxes have been a periodic problem in Lassen Volcanic National Park and the adjacent Lassen National Forest (Perrine and Arnold 2001; Perrine 2005)." The Lassen OSV project does not propose increases in levels of risk factors listed above. Perrine et al. (2010, pg. 28) also state that "Although the tolerance of Sierra Nevada red fox to the presence of humans is a topic of debate, it is clear that the non-native red foxes thrive in human-altered environments (Lewis and others 1999; Kamler and Ballard 2002)." Therefore, while Perrine et al. (2010, pg. 31) do state that "…the general lack of basic ecological information for this species makes the identification and analysis of threats a largely speculative exercise, and ultimately poses a risk to the effective management of the Sierra Nevada red fox and its habitat", it is apparent that they do not consider Sierra Nevada red fox tolerance of humans to be part of that general lack of basic ecological information. This information will be included in the Revised FEIS to clarify the issue of Sierra Nevada red fox sensitivity to human presence.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-73: The Forest Service Fails to Take a Hard Look at the OSV Project's Elimination of Sierra Nevada Red Fox Winter Habitat. I discuss the importance of deep snow habitat for the Sierra Nevada red fox in my March 14, 2016 letter (Perrine 2005; Perrine 2010; USFWS 2015a). The OSV Use project RDEIS still does not describe how different components of the proposed action including trail grooming, trail designation, and OSV use of designated and undesignated trails, in addition to cross-country travel, would modify red fox winter habitat by reducing or eliminating its availability to the fox. Instead, the habitat modification section focuses on competition and predation, not habitat modification by OSVs or grooming (BE p.113-114). The elimination of deep snow fox habitat from OSV compaction and trail grooming should be carefully considered in order to achieve a hard look under NEPA and inform the minimization analysis, as required.	249-73: The RDEIS (Chapter 3, pg. 543) describes that OSV use can have the following direct effects to carnivores, including Sierra Nevada red fox: displacement or avoidance away from human activities on or near roads, displacement of individual animals from breeding or rearing habitat, and physiological response to disturbance resulting in increased heart rate or stress levels. Possible indirect effects include behavioral modification such as altered or dispersed movement as caused by a route or human activities on or near a route and, secondarily, creation of a vector pathway for competitors or predators. Potential impacts to Sierra Nevada red fox habitat resulting from OSV compaction and trail grooming will be addressed in the Revised FEIS.
Wildlife	249-74e: One of the threats the Southern Cascades Sierra Nevada red fox DPS faces is predation. Coyote restrict the Sierra Nevada red fox at mid-elevations in otherwise suitable habitat (Perrine 2010). This is acknowledged in the BE, but not considered in the context of the proposed project. The USFS concludes that "the Service [USFWS] has determined that predation does not rise to the level of a threat currently nor is it likely to increase into the future." (BE p.114). But this conclusion seems to contradict statements made earlier in the analysis: "Increased competition and predation from coyotes due to climate change is thus likely to put the population at greater risk over the next 50 years." and "The Service, therefore considers competition and predation from coyotes to constitute a stressor with a medium level impact for Sierra Nevada red fox." (BE p.111). The USFS must weigh the risk of predation and climate change in the context of the OSV project, including allowing pervasive OSV impacts such as snow compaction, snow grooming, and noise disturbance across the Lassen sighting area and the Southern Cascades DPS.	249-74e: Elements contained in the science provided in Comment #249-8 (i.e., Moriarty 2014; Moriarty et al. 2015; Baltensperger et al. 2017; Manlick et al. 2017; Zielinski et al. 2017) concerning potential impacts to Pacific marten and Sierra Nevada red fox resulting from interactions between predicted climate change and OSV use will be included in the Revised FEIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-11a: The Sierra Nevada Red Fox Conservation Assessment (USDA R5-FR-010 2010) states: "The relatively low number and localized distribution of recent Sierra Nevada red fox sightings suggests a small, restricted, and possibly declining population. The report continues: "Like the wolverine, the Sierra Nevada red fox may be extremely sensitive to human presence" and that "Development and recreation, resulting in increased exposure to humans, vehicles and pets…" is a potential threat to the Sierra Nevada red fox.	250-11a: The RDEIS acknowledges the isolated nature and small effective population size of the Sierra Nevada red fox Southern Cascades DPS (Chapter 3, pg. 537). Buskirk and Zielinski (2003) state that "The Sierra Nevada red fox has been considered extremely sensitive to the presence of humans (Grinnell et al. 1937) so that increased recreation within its range could be problematic." Since Grinnell et al. (1937), more recent science indicates that Sierra Nevada red fox may not be extremely sensitive to human presence. For example, Perrine et al. (2010, pg. 28) state that "Risks from recreation are primarily associated with developments such as ski areas, snow parks, campgrounds, and picnic areas. In campgrounds without bear boxes, where campers' food and trash are more accessible, red foxes can develop begging habits and thereby increase the possibility for conflict with humans. Red foxes are intelligent and can quickly become acclimated to human handouts. They may be particularly susceptible in mountainous regions where natural productivity is low and winter food is scarce. Begging foxes have been a periodic problem in Lassen Volcanic National Park and the adjacent Lassen National Forest (Perrine and Arnold 2001; Perrine 2005)." The Lassen OSV project does not propose increases in levels of risk factors listed above. Perrine et al. (2010, pg. 28) also state that "Although the tolerance of Sierra Nevada red fox to the presence of humans is a topic of debate, it is clear that the non-native red foxes thrive in human-altered environments (Lewis and others 1999; Kamler and Ballard 2002)." Therefore, while Perrine et al. (2010, pg. 31) do state that "…the general lack of basic ecological information for this species makes the identification and analysis of threats a largely speculative exercise, and ultimately poses a risk to the effective management of the Sierra Nevada red fox and its habitat", it is apparent that they do not consider Sierra Nevada red fox tolerance of humans to be part of that general lack of basic ecological information. This information will be included in the Revised FEIS to clarify the issue of Sierra Nevada red fox sensitivity to human presence.
Wildlife	250-11d: The Sierra Nevada Red Fox Conservation Assessment cites studies in Yellowstone that show wolves may benefit red fox populations by reducing coyote numbers. Red fox may also benefit from scavenging carcasses of prey killed by larger carnivores, especially during winter. Given these studies, the reestablishment of wolves on the Lassen National Forest may benefit the Sierra Nevada red fox.	250-11d: The RDEIS (Chapter 3, pg. 541) discusses the potential benefits to Sierra Nevada red fox resulting from scavenging of deer carcasses killed by coyotes as well as general tendency of red fox to avoid coyotes. Additional information provided in the Sierra Nevada Red Fox Conservation Assessment (Perrine et al. 2010) concerning the potential effects of wolves will be included in the Revised FEIS where applicable.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-74a: The Information Presented in the RDEIS Suggests This Project May Have Substantial Impacts and Threaten the Viability of Wildlife Species. The Lassen NF OSV project has the potential for substantial impacts on wildlife species, thereby threatening their viability. As discussed below, the Sierra Nevada red fox is in a critical state, and to comply with NFMA's viability and diversity protection requirements, 16 U.S.C. § 1604(g)(3)(B), the Forest Service must avoid any possibility of leading to a trend toward federal listing of the Southern Cascades DPS. While we support Alternative 5, based on the information that is presented in the RDEIS, it appears that all alternatives, including the modified proposed action/Alternative 2, could harm and thus threaten the viability and distribution of the Sierra Nevada red fox, as well as Pacific marten. The current project is also inconsistent with governing forest plan direction, in violation of NFMA, 16 U.S.C. § 1604(i).	249-74a: The RDEIS (Chapter 3, pages 548-549) discloses the potential impacts of the alternatives on the viability of Sierra Nevada red fox. The analysis supports a determination of "May impact individuals, but not likely to lead to a loss of viability or a trend toward Federal listing" for all alternatives, and the reasons for this determination are provided.
Wildlife	249-74b: The Forest Service Has Not Supported a Finding that OSV Use in the Project Area Will Not Lead Toward a Trend Toward Federal Listing the Sierra Nevada Red Fox or Pacific Marten. The Forest Service relies on a forest-scale analysis to support its finding that the project is "not likely to lead to a loss of viability or a trend toward federal listing" for Sierra Nevada red fox (BE p.117). This is insufficient. Due to an effective population size of only 21 individuals, with no recent evidence of reproduction (Sacks et al. 2010), any impact on Sierra Nevada red fox in the project area may threaten viability of the species. Thus, analysis at the population-scale, the individual-scale, and the OSV-open-area-scale is necessary, particularly where the project would expose 65%-83% of fox habitat on the forest to OSV disturbance (BE p.115-116).	249-74b; 249-74d: The RDEIS (Chapter 3, pg. 540) acknowledges estimates for both the effective population size (21 individuals) and the actual population size (between 21 and 63 individuals). Potential stressors and impact factors at both the population and individual scales are identified (pgs. 539-542), including small population size and isolation, vehicles (including OSV vehicles), competition and predation, and climate change. The RDEIS (pg. 530) further states that interactions between SN red fox and OSVs is considered unlikely due to inverse differences of peak activity; therefore, the potential for injury, mortality, noise-based disruption of feeding or breeding is expected to be very low. In addition, the best available data indicate that coyotes are present year-round throughout the subspecies' range, but generally at lower elevations than Sierra Nevada red fox during winter and early spring when snow-packs are high, and available information does not indicate there has been any coyote predation on Sierra Nevada red fox, nor is there any information to indicate that coyotes are increasing at any of the sighting areas (pg. 545). Also, OSVs are likely to operate only within a small proportion of red fox suitable habitats (less than 27-32 percent, pg. 548). Den sites are unlikely to be affected by OSV due to topography, and if any known den site is disturbed it would be protected by a limited operating period (pg. 549). All of these factors combined indicate low risk to Sierra Nevada red fox individuals and populations as a result of proposed OSV use levels.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-7b: The RDEIS fails to take a hard look at noise disturbance for any of the eight individual OSV use areas or on a trail-by-trail basis. Goshawk- Goshawks are extremely sensitive to noise and human presence in or near the nest stands during periods of pair bonding, nest-building and incubation (Squires and Reynolds 1997; Keane et al. 2006). Nest failure has been repeatedly documented from research visits to nest areas prior to June (Keane et al. 2006). This is a significant forest-wide disturbance that must be minimized under Executive Order 11644. In order to reduce project impacts and comply with the 2004 Sierra Nevada Forest Plan Amendment, the USFS should implement LOPs for goshawk PACs (Feb.15-Sept.15), and conduct annual early season acoustic goshawk surveys to determine which PACs would need an LOP (see Standard and Guides 34 and 76).	249-7b: The RDEIS (Chapter 3, pgs. 529-533) acknowledges and addresses the potential impacts to goshawk nesting due to human disturbances. Minimization measures identified in the RDEIS (appendix C) state that under all action alternatives, we would continue monitoring Northern goshawk protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of Northern goshawk is occurring, we would mitigate according to Forest Plan direction.
Wildlife	249-65: The Lassen NF still does not recognize how actions described in the OSV Use project would remove winter marten habitat: "OSV use or related activities would not physically alter the vegetative composition or structure of marten habitat...." (BE p.78). This is an incomplete analysis of project effects on an imperiled species, representing a failure to take a hard look, failure to show how impacts were minimized. According to Slauson et al. (2017), "Habitat avoided in ski operations areas represents a temporary direct loss of the available habitat to support the marten population."	249-65: Slauson et al. (2017) examined marten seasonal response with a ski area, which consists of a highly fragmented landscape with pulses of concentrated human activity. The comparison of habitat condition and disturbance intensity between the Slauson et al. study area and conditions within the Lassen OSV project area as it relates to inference of effects to marten use and habitat will be included in the Revised FEIS. The RDEIS (Chapter 3, pg. 507) did discuss results from Zielinski et al. (2008) which studied the effects of OSV use on marten and concluded that none of the response variables they measured suggested that martens were affected by the level of OSV use that occurred in their study areas.
Wildlife	249-74c: The OSV Project BE also states that the project will not lead to a loss of viability or trend toward Federal listing for marten (BE p.81). The BE asserts that negative impacts from the project are expected for individual marten (BE p.78) but not would be contribute to significant impacts to the species (BE p.81). Yet, the agency does not consider all potential negative impacts from the project to marten. The BE briefly mentions potential impacts of direct mortality from grooming, but never considers the potential for groomed areas and parking areas to be sink habitat for marten populations (Slauson et al. 2017). These impacts may threaten marten viability in the project area, contrary to the RDEIS and BE.	249-74c: The potential for groomed areas and parking areas to be sink habitat for marten populations (Slauson et al. 2017) will be addressed in the Revised FEIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	250-11c: Studies of marten by Moriarty suggest that marten are more likely to venture into snow covered open areas than open areas without snow. Climate change and decreased snowpack resulting from warmer temperatures likely will negatively affect marten movement and dispersal, and thus their survival. Climate change is expected to reduce winter snowpack in the Lassen National Forest study area by more than 30%. Moriarty's studies indicate that climate change could result in a 40-80% reduction in Pacific marten habitat throughout California.	250-11c. The RDEIS (Chapter 3, pg. 505) cites Lawler et al. (2012) as a source for potential effects to predicted climate change on Pacific marten. Information provided in Moriarty (2014) will be included in the Revised FEIS where applicable to further clarify the potential impacts of climate change.
Wildlife	249-67: The Effects Analysis Does Not Adequately Address Marten Vulnerability to Predation. The project does not carefully consider or quantify the potential for OSV use to facilitate predator incursions into deep snow habitat; however, current research points to this as an important conservation issue (Perrine 2005; Kolbe et al. 2007; USFWS 2015a). The RDEIS and BE fail to recognize bobcat predation for marten locally and what abiotic and biotic factors are at play to make marten more vulnerable to bobcat.	249-67: The RDEIS (Chapter 3, pg. 507) acknowledges bobcats as potential predators and competitors in stating "Since marten have unique morphology that allows them to occupy deep snow habitats where they have a competitive advantage over carnivores, such as coyotes and bobcats, human modifications of this habitat, such as winter road use, over-the-snow travel, and OSV trails, can eliminate this advantage and increase access for predators and competitors."
Wildlife	249-68: The Project Underestimates Impacts of Vehicle Disturbance on Pacific Marten. Where they persist across their range, marten show a trend toward areas of lower human influence (Laliberte and Ripple 2004). In the Mt. Lassen area, marten seek areas without vehicle traffic. Occupied areas had significantly fewer roads ($p<0.001$) than sites without marten detections; road density was lower in areas with higher density of marten (Kirk 2007). Yet, to the contrary, the BE states that "As OSV trail use is an existing condition, animals that occur in the areas affected by the OSV program during winter may be habituated to OSV disturbance or may have already modified to avoid areas adjacent to trails or OSV noise" (p.77).	249-68: The BE (pg. 77, *Disturbance* section) presented the range of potential marten responses to OSV disturbance, from avoidance to possible habituation and cited Zielinski et al. (2007(8)) as a source suggesting habituation as a potential response. Zielinski et al. (2007(8)), in explaining why marten continued use of suitable habitats and did not shift to increased nocturnal activity despite OHV activity, suggested that this was due to 1) the fact that the stimuli were not perceived as a threat or 2) a flexible response strategy, such as habituation to OHVs that do not pose a significant risk. The BE (pg. 77) continues by clarifying that although the results of Zielinski et al. did not show OHV effects to marten occupancy, probability of detection, sex ratio, or activity patterns, there remains the possibility of effects to marten because the study did not measure behavioral, physiological, or demographic responses.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-74d: The Sierra Nevada red fox in California have undergone substantial declines recently, resulting in a population bottleneck and low genetic diversity (Sacks et al. 2010; USFWS 2015a). They have a restricted range and their small body size and large home ranges suggest the species is persisting in challenging conditions. In addition, their typical prey may have been displaced from the project area (Perrine 2005). The Lassen area effective population is only 21 individual fox, and these "critically low numbers" coincide with increases in coyote abundance in the state (Sacks et al. 2010). Moreover, there was no evidence of reproduction in 2012 and 2013 during genetic sampling on the Lassen NF (USFWS 2015a). The RDEIS and BE significantly understate the precarious status of Sierra Nevada red fox in the project area. Given the critically imperiled status of the Sierra Nevada red fox, population viability will be affected by impacts to individuals.	249-74d: The RDEIS (Chapter 3, pg. 540) acknowledges estimates for both the effective population size (21 individuals) and the actual population size (between 21 and 63 individuals). Potential stressors and impact factors at both the population and individual scales are identified (pgs. 539-542), including small population size and isolation, vehicles (including OSV vehicles), competition and predation, and climate change. The RDEIS (pg. 530) further states that interactions between SN red fox and OSVs is considered unlikely due to inverse differences of peak activity; therefore, the potential for injury, mortality, noise-based disruption of feeding or breeding is expected to be very low. In addition, the best available data indicate that coyotes are present year-round throughout the subspecies' range, but generally at lower elevations than Sierra Nevada red fox during winter and early spring when snow-packs are high, and available information does not indicate there has been any coyote predation on Sierra Nevada red fox, nor is there any information to indicate that coyotes are increasing at any of the sighting areas (pg. 545). Also, OSVs are likely to operate only within a small proportion of red fox suitable habitats (less than 27-32 percent, pg. 548). Den sites are unlikely to be affected by OSV due to topography, and if any known den site is disturbed it would be protected by a limited operating period (pg. 549). All of these factors combined indicate low risk to Sierra Nevada red fox individuals and populations as a result of proposed OSV use levels.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-58: In my previous comments submitted March 14, 2016 on the Lassen OSV Use Project DEIS, I outlined how forest carnivores, such as marten and fisher, tend to be wilderness species and are largely intolerant of human activities (Buskirk and Powell 1994; Buskirk and Ruggiero 1994; Lyon et al. 1994; Slauson et al. 2006; Zielinski et al. 2005a; Zielinski et al. 2005b; USDA Forest Service 2001; Spencer and Rustigan-Romsos 2012). Their low reproductive rates and large spatial requirements, by mammalian standards, make them more vulnerable to extirpation and extinction (Ruggerio et al. 1994). Marten in particular are threatened by population declines across the West (Buskirk and Powell 1994; Schneider and Yodzis 1994). Marten appear to seek deep snow during winter time, despite their lack of adaptations to cold temperatures, in order to isolate themselves from humans and to escape predators such as bobcat, fisher, and coyote (Krohn et al. 1997; Buskirk and Ruggiero 1994). Bobcat are a significant predator on marten and fisher in the absence of deep snow (Bull and Heater 2001; Moriarty 2014; Wengert et al. 2014). Grooming and cross-country OSV travel disrupts seasonal habitat partitioning among carnivores by facilitating generalists, such as coyote, into deep snow habitat where they would otherwise not be able to intrude (Kolbe et al. 2007). Nocturnal trail grooming also displaces marten from high quality habitat, which can lead to source-sink population dynamics between groomed and ungroomed areas (Slauson et al. 2017). Core marten populations occur in the Swain Mountain, Jonesville/ Humboldt Peak, and nearby wilderness areas (Kirk 2007; Moriarty 2014). Spencer and Rustigian- Romsos (2012) modeled potential habitat and movement corridors in the Cascade and Sierra Nevada regions.	249-58: The scientific literature listed in the comment will be reviewed and addressed in the Revised FEIS analysis where applicable if not previously considered in the RDEIS.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-8: A significant risk factor for Pacific marten and Sierra Nevada red fox that is not adequately discussed in the OSV RDEIS or BE is climate change. To ensure that project impacts on winter marten and Sierra Nevada red fox habitat are truly minimized, USFS should carefully consider how allowing widespread OSV use in occupied habitat may act synergistically with climate change to compromise habitat connectivity, reduce availability of winter refugia, and interfere with competition or predator-prey dynamics.	249-8: The RDEIS (Chapter 3, pg. 466) states that "Climate change, when identified as a specific threat (marten) or stressor (Sierra Nevada red fox) to a species, is disclosed, by species. However, synergistic impacts of climate change with those of OSV use and related activities are largely unknown at this time." Elements contained in the science provided in the comment (i.e., Moriarty 2014; Moriarty et al. 2015; Baltensperger et al. 2017; Manlick et al. 2017; Zielinski et al. 2017) concerning potential impacts to Pacific marten and Sierra Nevada red fox resulting from interactions between predicted climate change and OSV use will be included in the Revised FEIS. Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2).
Wildlife	254-23: Simply comparing how many acres are designated for OSVs in each alternative does not provide the granular information necessary to complete this level of analysis. Wildlife habitat is site-specific, and all acres of the forest do not provide equal habitat. Therefore, it is misleading to use an acreage comparison to illustrate how each alternative does or does not minimize impacts to wildlife species.	254-23: Acreage and trail mileage tables provided in the RDEIS (tables 141-144) provide comparisons among alternatives at the project-level scale. Sections within the RDEIS addressing individual species contain analysis of effects at more refined spatial scales, such as known breeding areas of northern spotted owl, California spotted owl, northern goshawk, bald eagle; known use areas of fisher, American marten modeled winter habitat areas and connectivity corridors, and mule deer winter range.
Wildlife	249-7e: California Spotted Owl- California spotted owls have been shown to be sensitive to diurnal OHV noise (Hayward et al. 2011). As we have outlined in previous comments, these types of stress responses are very serious, and can affect population sex ratios and even fecundity. The RDEIS fails to adequately analyze and minimize these potential impacts, including consideration of system design elements such as LOPs and buffers around PACs and nest sites, and periodic nest surveys to inform and adjust LOPs.	249-7e: The RDEIS (Chapter 3, pgs. 521-524) acknowledges and addresses the potential impacts to California spotted owl nesting due to human disturbances. Minimization measures identified in the RDEIS (appendix C) state that under all action alternatives, we would continue monitoring California spotted owl protected activity centers (PACs) for adverse effects from OSV use. If monitoring determines harassment of spotted owls is occurring, we would mitigate according to Forest Plan direction.
Wildlife	249-63: We remain concerned that road density estimates throughout the RDEIS don't include both designated and undesignated routes, thereby underestimating actual trail density throughout the project area. This issue should also be corrected in the Revised FEIS.	249-63: OSV use of undesignated routes would only be authorized within areas designated for cross-country OSV travel. Additional effects to wildlife species resulting from undesignated routes or route densities within areas designated for cross-country OSV travel will be addressed in the Revised FEIS where applicable.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	249-7c: Wolf - In 2016 a wolf pack was detected in the project area and later reproduction was confirmed. Wolves are negatively associated with roads and tend to be absent where road densities exceed 0.45 - 0.6 km/km2 (Buskirk and Zielinski 2003). The denning period begins in mid-March and overlaps with OSV use on the Lassen NF. The RDEIS does not take a hard look at project impacts to wolves or demonstrate how those impacts are minimized.	249-7c: The RDEIS (Chapter 3, pgs. 486-487) recognizes the potential for incidental OSV disturbance of wolf den sites and individual wolves on established routes and in areas designated for cross-country travel. In addition, the RDEIS (Chapter 3, pg. 484-485) cites Witmer et al. (1998) in recognizing that wolves generally avoid areas with road densities greater than 1.0 mile per square mile. Minimization measures benefiting wolves include the substantial acreage reduction of areas designated for OSV use under alternatives 3 and 5, as well as the removal of all mule deer winter ranges from designation for cross-country OSV travel. The need for additional minimization measures pertaining to gray wolf den sites will be addressed in the Revised FEIS. Analysis pertaining to the potential effect of existing and proposed OSV route densities will also be addressed in the Revised FEIS. Chapter 1 of the Revised FEIS describes how the minimization criteria were applied in the designation of areas and trails for OSV use in each alternative (see Chapter 1, section titled, "Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles;” subsection titled "Designation Criteria;" sub-subsection titled, "Minimization Criteria," and table 2).
Wildlife	249-7d: Wolverine- There is one known resident wolverine living on or near the Tahoe NF. It is monitored by the California Department of Fish and Wildlife. The BE describes wolverine as extirpated from the Sierra Nevada (p. 60). While the number of wolverine in the Sierra Nevada is likely low, sightings continue to be reported and additional animals dispersing from the Rockies are possible. The USFS should consider how to maintain suitable habitat for wolverine while posing minimal disturbance, as the Forest Plan directs.	249-7d: Minimization measures identified in the RDEIS (appendix C) state that under all alternatives, detection of a wolverine would be validated by a forest carnivore specialist. When verified sightings occur, we would manage the area according to forest plan direction.
Wildlife	249-10: Comment states that the maps supporting the biological evaluation for wildlife were not included in the RDEIS.	249-10: The maps supporting the biological evaluation for wildlife were inadvertently not included in the RDEIS. They are included in the Revised FEIS.
Wildlife	153-2: There is no wildlife in the upper elevations where snowmobiles are in the winter. Or at least I have never seen any except for maybe a few birds in the trees. Snowmobile noise is a non-issue since there is no wildlife in the area. And if there were, it gives them a heads up way far out where you are. Whereas human foot traffic is so silent that you startle animals which is even worse.	153-2: Federally listed and Forest Service sensitive species for which seasonal ranges may overlap OSV use areas in the project area are addressed in detail in the RDEIS (Chapter 3). The analysis addresses applicable science concerning the potential effects of OSV disturbance of wildlife.

Resource	Sample Comment Number, and Public Concern	Agency Response
Wildlife	191-2: It has been proven that there is no impact to any wildlife or the forest itself by allowing travel over snow.	191-2: Federally listed and Forest Service sensitive species for which seasonal ranges may overlap OSV use areas in the project area are addressed in detail in the RDEIS (Chapter 3). The analysis addresses applicable science concerning the potential effects of OSV disturbance of wildlife.
Wildlife	225-10: Wildlife Considerations In the winter, elk and deer populations do not live in the areas that snowmobiles use. Since there is no feed for these wildlife populations in the snow, there is no impact to wildlife populations by snowmobiles. For all alternatives presented, the original DEIS said the viability of the species would not likely be affected, and wildlife, air quality, and noise were issues that would not impact OSV. In the RDEIS, wildlife is not an issue.	225-10: The RDEIS (Chapter 3) analyzed the potential effects to listed and sensitive species and determined that the alternatives would have no effect or impact on some species, while for others, proposed activities may affect or impact individuals.
Wildlife	247-21: Comment asserts the analysis overstates the impact of motorized recreation on fish and wildlife, is biased against motorized recreation, and should compare the impacts of OSV use with other uses.	247-21: We used credible science to analyze the potential effects of OSV use. The purpose of this analysis is to designate areas and trails for over-snow vehicle use as required by the travel management regulations at 36 CFR Part 212, Subpart C. Neither the executive orders nor the travel management regulations which implement them are intended to regulate non-motorized use. The vehicles that this analysis and decision are intended to regulate are OSV vehicles, defined in the travel management regulations as, "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."

Resource	Sample Comment Number, and Public Concern	Agency Response
Other	623-24: Comment states they provided copies of the "Facts and Myths About Snowmobiling and Winter Trails" to the OSV Team Leaders and to the Enterprise Team at the Lassen and Plumas NOI Public meetings. This publication was developed by the American Council of Snowmobile Associations with funding provided by the Recreational Trails Program administered by the U.S. Department of Transportation - Federal Highway Administration (FHWA). This is a well-known publication which provides information including, but not limited to, impacts to soil and vegetation, water, emissions, noise levels, economics, and planning for multiple-use winter recreation. It is a comprehensive publication that FS management and the TEAMS said they would use. However, there is no mention of this publication in the DEIS. Comment asks agency to "Please respond, because it is important for us to know why the Forest Service ignored this publication."	623-24: We cite many of the same references in our analyses as cited in the "Facts and Myths" publication. The botanist reviewed the document and found it to make very general statements of information – not necessarily incorrect, but not necessarily supported by scientific literature either. We found that the document does not address impacts to woody vegetation at all. The document refers to several scientific citations which we use (such as Keddy 1979). The "Facts and Myths…" document mentions a delay of spring growth as evidence of no effect, but we analyze additional literature regarding snow compaction and resulting delayed melting and take into consideration other factors in our assessment of effects to botanical resources. Although this publication was not cited directly, the Recreation analysis has cited much of the supporting science that is also cited in the "Facts and Myths About Snowmobiling and Winter Trails" publication, including: Aasheim 1980, Arnold/Koel 2006, Banci 1994, Canfield 1999, Copeland 1996, Copeland et al 2007, Foresman 1976, Freddy 1986, Keddy 1979, Musselman 2007, Olliff 1999, Ryerson 1977, and Wildlife Resource Consultants 2004. The DEIS also cited various Yellowstone National Park studies and Lassen National Forest National Visitor Use Monitoring data that was referred to in the Facts and Myths publication. The air quality analysis cites the referenced document in the RFEIS.
Other	226-6: Comment is summarizing conclusion from DEIS.	226-6: No response needed.
Other	441-1: Comment states appreciation for both non-motorized and motorized forms of recreation.	441-1: Thank you for your comment
Other	629-1: Comment provides general information about the organization.	629-1: Thank you for your comment.
Other	629-19, 629-20, 629-28, 629-31, 629-34, 629-67, 629-69, 629-74: Comment provides photographs or additional information for reference or to consider in general when making a final decision.	629-19, 629-20, 629-28, 629-31, 629-34, 629-67, 629-69, 629-74: Thank you for your comment and the additional information. It will be evaluated as we develop a decision.

Appendix J. List of Agencies, Organizations, and Persons to whom Copies of the Statement were Sent