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Lassen National Forest Over-snow Vehicle Use Designation

Final Environmental Impact Statement

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Forest Service

Lassen National Forest

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Final Environmental Impact Statement

Lassen National Forest

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

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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 snow trails and areas on National Forest System 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 OSV use that is inconsistent with the OSVUM would be prohibited under Federal regulations at 36 CFR §261.14.

This environmental impact statement describes the proposed action (as modified since the publication of the Draft Environmental Impact Statement), a no-action alternative, and two additional action alternatives developed in response to issues, and discloses their environmental impacts.

Appendices

The following appendices support the information documented in this FEIS.

Contents

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)

Forest-wide 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		

Management Prescription	Description	OHV Management Practices		Other Relevant Direction
		Emphasized	Permitted	
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)
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)

Management Prescription	Description	OHV Management Practices		Other Relevant Direction
		Emphasized	Permitted	
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: 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 DEIS 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 closed to 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.

Table 1. 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

Allotment	Livestock	Season of Use	AUMs
Murphy Hill	Cattle	7/1 – 9/30	199
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

Table 2. Reasonably foreseeable future actions on the Lassen National Forest

Project Name	Project Purpose	Planning Status	Decision	Expected Implementation	Project Contact
Lassen National Forest	**Almanor Ranger District (excluding Projects occurring in more than one District) R5 - Pacific Southwest Region**				
Big Meadows Powerline Improvement Project CE	- Special use management	Developing Proposal Est. Scoping Start 07/2016	Expected:08/2016	09/2016	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.				
Big Springs Project CE	- Heritage resource management - Wildlife, Fish, Rare plants - Grazing management - Vegetation management (other than forest products) - Watershed management	Developing Proposal Est. Scoping Start 10/2016	Expected:04/2017	07/2017	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, .				
Chips Creek Bridge CE	- Recreation management	Developing Proposal Est. Scoping Start 08/2016	Expected:11/2016	06/2017	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	Project Purpose	Planning Status	Decision	Expected Implementation	Project Contact
Grizzly Restoration Project EA	- Recreation management - Wildlife, Fish, Rare plants - Forest products - Fuels management - Watershed management - Road management - Research and Development	In Progress: Scoping Start 05/05/2015 Est. Comment Period Public Notice 08/2016	Expected:01/2017	07/2017	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=43332				
	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.				
High Lakes Motorized Trail Re- routes and Staging Area Improvements EA	- Recreation management - Special area management - Watershed management	In Progress: Scoping Start 02/17/2016 Est. Comment Period Public Notice 07/2016	Expected:12/2016	06/2017	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.				
Ridge Project CE	- Recreation management - Special area management - Vegetation management (other than forest products) - Fuels management - Watershed management	Developing Proposal Est. Scoping Start 08/2016	Expected:12/2016	06/2017	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.				

Project Name	Project Purpose	Planning Status	Decision	Expected Implementation	Project Contact
Rocks Restoration EA	- Wildlife, Fish, Rare plants - Forest products - Fuels management - Watershed management	Developing Proposal Est. Scoping Start 10/2016	Expected:10/2017	06/2018	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.				
Storrie Aquatic Organism Passage (AOP) Project CE	- Wildlife, Fish, Rare plants	Completed	Actual: 06/09/2016	09/2016	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**				
Moonlight Hand Thinning Project CE	- Wildlife, Fish, Rare plants - Vegetation management (other than forest products) - Fuels management	In Progress: Scoping Start 05/09/2016	Expected:07/2016	06/2017	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.				
Re-issuance of Eagle Lake Rec Area Special Use Permit (Concessionaire) CE	- Recreation management - Special use management - Facility management	Developing Proposal Est. Scoping Start 07/2016	Expected:09/2016	09/2016	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.				

Project Name	Project Purpose	Planning Status	Decision	Expected Implementation	Project Contact
Rust Resistant Sugar Pine Maintenance CE	- Vegetation management (other than forest products)	In Progress: Scoping Start 04/15/2014	Expected:07/2016	08/2016	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**				
Bailey Creek Aquatic Organism Passage (AOP) Project CE	- Wildlife, Fish, Rare plants - Watershed management - Road management	Developing Proposal Est. Scoping Start 07/2016	Expected:09/2016	09/2016	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.				
Big Lake Restoration Project CE	- Wildlife, Fish, Rare plants - Vegetation management (other than forest products) - Watershed management	In Progress: Scoping Start 04/19/2016	Expected:08/2016	08/2016	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.				
Halls Flat Windthrow Project EA	- Forest products - Fuels management	In Progress: Scoping Start 03/16/2016 Est. Comment Period Public Notice 06/2016	Expected:10/2016	10/2016	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.				

Project Name	Project Purpose	Planning Status	Decision	Expected Implementation	Project Contact
Hat Creek Valley Powerline Spur CE	- Special use management	Developing Proposal Est. Scoping Start 07/2016	Expected:08/2016	09/2016	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.				
Plum Restoration Project EA	Wildlife, Fish, Rare plants - Forest products - Vegetation management (other than forest products) - Fuels management - Watershed management - Road management	Developing Proposal Est. Scoping Start 08/2016	Expected:06/2017	06/2017	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 D: 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:

1. Identify areas or routes where off-highway vehicle use could cause degradation of water quality.
2. Establish baseline water quality data for normal conditions as a basis from which to measure change.
3. Identify water quality standards and the amount of change acceptable.
4. Establish monitoring measures and frequency.
5. Identify controls and mitigation appropriate in management of off-highway vehicles.
6. 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 snowmobile 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 snowmobiles, 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 will 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 E. Summary of Public Comments

The notice of availability for the Draft Environmental Impact Statement for the Lassen National Forest Over-snow Vehicle Designations was published in the Federal Register on Friday, January 29, 2016. The public comment period began on January 30, 2016 and was open for 45 days.

The agency received 156 comment letters containing 623 comments from 142 interested groups, individuals, and agencies in the form of letters, emails, and website submissions. We read each comment, removed redundancies, and determined that 357 comments were materially relevant to the analysis. Those comments are listed in table 3. Forest Service's responses to each comment are the underlined statements under the text of each public comment in the right-hand column of the table.

Because duplicate comments were submitted by more than one commenter, table 3 is not a complete listing of commenters who may have standing in the pre-decisional administrative review process.

Types of Public Comments Considered Materially Relevant and Included in this Summary

- Agency is alleged to have misinterpreted or failed to consider an alternative or alternative feature that the commenter considers reasonable.
- Agency is alleged to have failed to analyze a cause-effect relationship.
- Agency is alleged to have failed to correctly analyze a cause-effect relationship.
- Agency is alleged to have failed to comply with law, regulation, or policy (e.g., Travel Rule, NFMA, NEPA, ESA).
- Agency is alleged to have made a change in established precedent without adequate justification.
- Agency is alleged to have developed alternatives, design features, monitoring measures, and enforcement measures that are not clearly described.

Comments on Minimization as Required by the Travel Regulation at 36 CFR §212.55(b)

The travel regulations at 36 CFR §212.55(b) require the responsible official, in the designation of areas and trails, to

> 1. 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.

Many commenters expressed the opinion that the language in the Travel Management Regulations requires the decision to minimize damage, harassment, significant disruption, and conflicts to the extent that they would not occur at all. This interpretation is not correct. Following this interpretation, there would be no need to analyze alternatives because only one alternative – no OSV use – would satisfy this interpretation.

> 2. An extreme interpretation of 'minimize' would preclude any use at all, since impacts always can be reduced further by preventing them altogether. 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).

Types of Public Comments Considered Not Substantive and Not Included in this Summary, with Examples

- Public expressed a "vote" for or against an alternative or action, including "No Action."

  "We support Alternative 3 because…"

  "Alternative 2 provides the best compromise."

  "Please don't close any more OSV riding areas."

  "Please set aside areas where people can go skiing w/o being exposed to the noise and fumes of snow mobiles."

  "There is no OSV trail through the [XYZ] area. Please designate an OSV trail there."

- Public expressed a resource concern without a site-specific or regulatory context.

  "It is very important to me that there are places I can go on the LNP and not hear or smell snowmobiles."

- Public expressed a concern or made a request to take an action that is outside the agency's regulatory jurisdiction, outside the scope of the project, or contrary to or already established by higher-level direction.

  "The proposed alternative, Alternative 2, does not create a single recreation area adjacent to a winter trailhead where cross-country snowmobile travel is prohibited."

  "Separate trailheads should be made available for non-motorized users."

  "An alternative should have required the use of BAT to minimize noise and air pollution."

  "OSVs should not be allowed on the Pacific Crest Trail."

  "Please keep wheeled vehicles and fat-wheeled bikes off of groomed trails"

  "We suggest that the Forest seek to find balance between motorized and non-motorized winter use opportunities in the Final EIS."

- Public requests that the agency include actions that are already included in one or more action alternatives.

  "There has to be some areas off-limits for OHVs. They are noisy and occasionally destructive."

- Public requests that the agency not include actions that are currently not included in one or more action alternatives.

- Public provides a statement of opinion.

  "The cross country skiers reap the benefits of our OSV registration dollars by using the groomed trails."

  "Many people utilizing the Forest's recreation areas via ski, snowshoe or foot are looking for an experience that creates solitude and separation from motorized travel."

- Public suggests actions for consideration in the future.

  "For future policy I would recommend opening up more area to OSV use on the Forest."

For future considerations, we would like to see additional miles of OSV groomed trails and non-motorized trails as funds (grant funds or budgeted funds) become available.

Table E-1. List of commenters submitting materially relevant comments listed in table E-3

Letter #	First Name	Last Name	Organization Name	Date
1	Dale	Knutsen		2/2/2016
2	Jerry	Ross		2/11/2016
3	Darin	Pantaleoni		2/14/2016
4	Rourke	Hembree	TC Snowmobilers	2/16/2016
6	Mike	Visinoni		2/20/2016
7	Lorraine	Forrester-Hansen		2/11/2016
8	Sylvia	Milligan		2/10/2016
9	Michael	Dee		2/23/2016
10	Albert	Wiebe		2/23/2016
12	Scarlett	Martin		2/22/2016
13	Gerald	Gates		2/24/2016
14	Keith	Crawford		2/24/2016
15	Seth	Levy		2/23/2016
16	Eric	Wold		2/22/2016
17	Carol	Greenstreet		2/23/2016
19	John	Cordes		2/23/2016
21	Bob	W		2/24/2016
22	Anonymous	A		2/23/2016
24	Louise	Wholey		2/23/2016
25	Paul	Minault		2/23/2016
27	Bobbie	Morrison		2/23/2016
31	Hamish	Gowans		2/25/2016
32	H	Whitaker		2/25/2016
33	Kris	Thomas		2/24/2016
34	James	Inskeep		2/25/2016
37	Christian	Buss		2/25/2016
38	Richard	Nolthenius		2/24/2016
39	Anonymous	guyayers@comcast.net		2/25/2016
40	Don	Triplat	Sierra Avalanche Center	2/24/2016
41	Nicola	Spaldin		2/25/2016
42	Thelma	Matlin		2/24/2016
44	Noah	Israel		2/25/2016
45	Todd	Davis		2/26/2016
46	Jon	Miller		2/26/2016
47	Russell	Mumm		2/26/2016
48	Mitch	Markey		2/27/2016

Letter #	First Name	Last Name	Organization Name	Date
49	Kevin	Bradford		2/29/2016
50	John	Dozier		2/29/2016
52	Anonymous	w_b@comcast.net		2/25/2016
53	Debbie	Bulger		2/26/2016
54	Korbinian	Thalhammer		2/25/2016
56	Steven	Smith		2/26/2016
57	Carl	Gould		2/25/2016
59	Donald	Zuliani		2/29/2016
60	Chris	Kantarjiev		3/2/2016
61	Michael	Dooley		3/4/2016
63	Kyra	Geithman		3/4/2016
64	Chris	Marrone		3/7/2016
66	Matt	Kowta		3/7/2016
67	Darla	DeRuiter		3/8/2016
68	Gavin	Back		3/8/2016
69	Rob	Stone		3/8/2016
73	Peggy	Moak	Butte County Board Of Supervisors	3/8/2016
74	Steph	Spencer		3/6/2016
75	Phil	Nemir		3/8/2016
77	robert	shattuck		3/9/2016
78	Dave	Montgomery		3/9/2016
79	William	Peterson		3/9/2016
80	Bob	Rowen	Snowlands/ Winter Wildlands Alliance	3/10/2016
82	Thad	Walker		3/11/2016
83	Marla	Nelson	Wildearth Guardians	3/10/2016
84	Barry	Parker		3/11/2016
85	Jeff	Mecham		3/10/2016
86	Emma	Walker		3/10/2016
87	Stephen	Anspach		3/11/2016
91	Travis	Feist		3/14/2016
92	David	Erskine		3/14/2016
93	Travis	Feist		3/14/2016
94	Travis	Feist		3/14/2016
95	Margaret	Rhyne		3/11/2016
99	David	Lubertozzi		3/13/2016
101	Anonymous	David		3/11/2016
102	Anonymous	scedartree@aol.com		3/14/2016
103	Anonymous	billferree@frontiernet.net		3/12/2016
104	Dave	Zentner		3/11/2016
105	Jeff	Mecham	SNO-Riders, Inc.	3/11/2016

Letter #	First Name	Last Name	Organization Name	Date
106	Charles	White		3/11/2016
107	Betty	McMartin		3/13/2016
109	Frances	Davis		3/11/2016
110	Harvey	Ceaser		3/12/2016
111	Eric	Valentino		3/11/2016
112	Glenda	Marsh		3/13/2016
114	Doug	Sherman		3/11/2016
116	Glenn	Fisher		3/13/2016
117	Vassil	Spasov		3/12/2016
118	Dolly	Chapman		3/11/2016
119	Larry	Hoffman		3/14/2016
120	Robert	Berger		3/14/2016
121	Jeff	Erdoes		3/14/2016
122	Maureen	Downing-Kunz		3/14/2016
124	Janet	Hoffmann		3/15/2016
125	Corky	Lazzarino	SAC	3/14/2016
126	David	Sausjord		3/15/2016
127	MaryAnn	Dresner		3/14/2016
128	Darca	Morgan		3/14/2016
129	Karen	Ulsh	Butte Meadows Hillsliders	3/14/2016
130	Christina	Fossum	USDI	3/14/2016
131	Marjorie & Frank	Lattka		3/14/2016
132	Marjorie	Lattka		3/14/2016
135	Paul	Finkel		3/14/2016
136	Darell	Jury	Friends of Plumas Wilderness	3/14/2016
137	Darrel	Jury		3/14/2016
139	Justin	Kooyman	PCTA	3/14/2016
141	Rob	Russell		3/15/2016
142	Carole	Montgomery		3/16/2016
143	James	Munson	U.S. EPA, Region IX	3/15/2016
144	Bob	Wagner		3/15/2016
147	Jack	Montgomery		3/16/2016
148	Stan	Velsor		3/14/2016
149	Patricia	Puterbaugh		3/15/2016
150	Anonymous	CLsecurestorage		3/15/2016
152	Patricia	Puterbaugh		3/15/2016
153	Stanley	Bales		3/15/2016
155	Vernon	Thornburg		3/14/2016
156	Sylvia	Milligan	ROC	3/14/2016

Table E-2. Locations of materially relevant comments by topic in table E-3

Topic	Sub-topic	Sub-sub-topic	Table E-3 Page E-#
Air	Design Feature		9
Air	General		
Air	Monitoring		
Alternatives	Design Feature		10
Aquatics	Analysis	Salmon	11
Aquatics	Analysis	SNYLF	
Aquatics	Analysis	Steelhead	
Coordination			12
Cultural			13
Economics	Analysis		13
Enforcement			15
Impacts	Analysis	Cumulative	19
Impacts	No		
Info Request			19
Minimization	Air		19
Minimization	Climate		20
Minimization	General		21
Minimization	Recreation		35
Minimization	Recreation	Conflict	
Minimization	Recreation	Non-motorized	
Minimization	Soil		40
Minimization	Water		40
Minimization	Wildlife		42
Minimization	Wildlife	SNRF	
Monitoring	General		43
Recreation	Alternative	Modification	47
Recreation	Alternatives		
Recreation	Alternatives	BAT	
Recreation	Alternatives	Incorrect	
Recreation	Alternatives	Modification	
Recreation	Alternatives	Motorized	
Recreation	Alternatives	Non-motorized	
Recreation	Alternatives	Range	
Recreation	Analysis	Climate	58
Recreation	Analysis	Impacts	
Recreation	Analysis	Noise	
Recreation	Conflict		60
Recreation	Discrete Areas		60
Recreation	Discrete Areas	Closed Unless Open	

Topic	Sub-topic	Sub-sub-topic	Table E-3 Page E-#
Recreation	Elevation		65
Recreation	Grooming	Mileage	65
Recreation	Monitoring		66
Recreation	Monitoring	Non-motorized	
Recreation	Noise		67
Recreation	Non-motorized		67
Recreation	Non-motorized	Recommended wilderness	
Recreation	P&N		69
Recreation	PCT		70
Recreation	PCT	Corridor	
Recreation	PCT	Crossings	
Recreation	Roadless		74
Recreation	Safety		74
Recreation	Season		74
Recreation	Trailheads	Motorized	74
Recreation	Trailheads	Non-Motorized	
Recreation	Trailheads	Separate	
Recreation	Vehicle Type		77
RNA	Access		77
Snow Depth			78
Snow Depth	Season		
Soil			84
Water			84
Water	Analysis		
Wildlife	Analysis		86
Wildlife	Analysis	CaSO	
Wildlife	Analysis	Climate	
Wildlife	Analysis	Cumulative Impacts	
Wildlife	Analysis	ESA	
Wildlife	Analysis	Fisher	
Wildlife	Analysis	Marten	
Wildlife	Analysis	Marten & CaSO	
Wildlife	Analysis	Marten & SNRF	
Wildlife	Analysis	Noise	
Wildlife	Analysis	NSO	
Wildlife	Analysis	Predators	
Wildlife	Analysis	SNRF	
Wildlife	Analysis	Subnivean	
Wildlife	Analysis	Wolf	
Wildlife	Analysis	Wolverine	

Topic	Sub-topic	Sub-sub-topic	Table E-3 Page E-#
Wildlife	Design Feature		

Table E-3. Materially relevant comments, organized by topic

Letter #	Comment #	Topic	Comment Text and Forest Service Response
83	17	Air Quality	Increased snowmobile pollutant emissions could be particularly problematic in areas where snowmobiles congregate (i.e., trailheads) and during short periods of poor air dispersion (e.g., valleys where frequent inversion conditions may trap air pollutants). Some visitors and employees at Yellowstone National Park have experienced health effects from over-snow vehicle emissions even though the NAAQS have not been exceeded. In general, snowmobile emissions are worst when the engine is first started and hasn't yet warmed. For this reason trailheads are areas where this concern is greatest. If there are heavily used trailheads with large numbers of snowmobiles where stable air is present, the Forest Service should consider placing signs or implementing patrols on heavy use mornings to encourage users to limit idling time. The U.S. Environmental Protection Agency (EPA) and Montana Department of Environmental Quality encourage use of the newer less polluting 4- stroke engine snowmobiles (e.g., http://www.deq.state.mt.us/CleanSnowmobile/solutions/engine/four-stroke.asp). The Forest Service should consider similar outreach and education to OSV users on the Lassen National Forest. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources. Use of these trailheads would be limited by the amount of parking available at each trailhead. OSV use at these trailheads would not be high enough to cause significant adverse effects to air quality and public health. Therefore, it would not be necessary to post signs for motorized users to limit idling time or signs suggesting the use of four-stroke engines to maintain air quality.
143	4	Air Quality	EPA also recommends that the FEIS evaluate air quality impacts from construction equipment, such as snowcats and other tracked vehicles, and identify mitigation measures that would reduce such impacts. Specifically, EPA recommends that, where possible, the Forest Service ensure that construction vehicles use the cleanest burning, highest tier engines practicable or mandate the installation of diesel particulate filters on older construction equipment. Other mitigation opportunities to further reduce emissions include limiting truck and heavy equipment idling to no more than 5 minutes and limiting vehicle speeds to 15 mph or less wherever practicable. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources. Grooming operations are funded and regulated by the State of California. The State implements all necessary air quality standards to address this issue. Idling times for equipment vary but idling of grooming equipment is recommended by the State of California. The State of California owns the grooming equipment. Some idling is necessary to keep the grooming equipment in operating condition. Not allowing the grooming equipment engine temperature to stabilize before shutdown damages the engine and turbo charger (if so equipped). The engine should idle a few minutes so the oils can circulate (California Department of Parks and Recreation. Off Highway Motor Vehicle Recreation Division. 1997). Grooming equipment speeds would not exceed 15 miles per hour. OSV grooming typically occurs at night when use of trails for winter recreation is low or non-existent, and traces of air pollution are dispersed and cannot be sensed by the next morning when recreational use begins.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
83	81	Air Quality	In addition to the monitoring identified in the DEIS (see DEIS at 32-33), the Forest Service should monitor for air quality impacts from OSV use, as suggested in the air quality portion of this section. The Forest Service has no regulatory jurisdiction over air quality. These levels are set by state law. The EIS analyzes the effects of the proposed action and alternatives on air quality.
83	52	Air Quality	To effectively minimize the significant air quality impacts associated with OSV use, the Forest Service should monitor air quality and noise near trails, at trailheads, and in OSV areas with heavy OSV traffic. In response to this suggestion from previous comments, the Forest Service claims that "monitoring of ambient air quality and noise is outside the scope of the purpose and need for action," that the agency "has no regulatory jurisdiction over air quality or noise," and that "[t]here are no standards . . . to identify or enforce prohibitions against unacceptable noise or air quality levels." DEIS at 37. These statements are incorrect. The Forest Service has no regulatory jurisdiction over air quality or noise. These levels are set by state law. The EIS examines effects of the proposed action and alternatives on air quality and ambient noise levels. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS.
148	35	Alternatives	Locate designated routes away from high-value and sensitive resource areas, including sensitive winter wildlife habitat and important non-motorized winter recreation areas. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources. Routes would be located away from high-value and sensitive resource areas, including sensitive winter wildlife habitat and important non-motorized winter recreation areas, where necessary, to minimize adverse impacts to resources. Trails and areas were originally located away from these areas based on a previous analysis. Any new measures found to be necessary to minimize impacts on high-value and sensitive resource areas, including sensitive winter wildlife habitat and important non-motorized winter recreation areas, are identified in the FEIS.
148	38	Alternatives	Allocate unplowed roads fairly between designated OSV routes and non-motorized routes closed to OSV use We considered this allocation in the development of the proposed action and alternatives.
148	39	Alternatives	Where necessary to designate an OSV route through a non-motorized area, locate and manage the route to minimize disturbance by imposing speed and idling limitations and ensuring that use is restricted to the trail itself Minimization measures are disclosed in the FEIS. We considered this minimization measure in the development of the proposed action and alternatives and it would be implemented where necessary. The OSVUM would include these limits and restrictions. Important information would also be provided at kiosks at each trailhead.
148	40	Alternatives	Locate routes designated within open areas - especially groomed routes - to minimize environmental damage and conflicts with other recreational uses We considered this in the development of the proposed action and alternatives. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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83	91	Aquatics	Central Valley spring-run Chinook salmon and Central Valley Steelhead are both listed as threatened under the ESA. The Forest Service recognizes that both species have the potential to occur on the Lassen National Forest in the southwestern portion. For Central Valley spring-run Chinook salmon, designated critical habitat includes the Sacramento, lower Feather, and Yuba Rivers, and Beegum, Battle, Clear, Cottonwood, Antelope, Mill, Deer, Butte, and Big Chico Creeks. Within the Lassen National Forest, this includes Antelope, Mill, and Deer Creeks. DEIS at 287. The Chinook salmon occupies the Sacramento-Thomes-Elder-Mill sub- basin and the Sacramento-Deer sub-basin. DEIS at 286. Essential Fish Habitat for the Chinook salmon also exists in the southwestern corner of the Lassen National Forest. The Steelhead has designated critical habitat in the southwestern corner of the Lassen National Forest. This includes the Panther Creek drainage, covering Upper South Fork Battle Creek subwatershed. DEIS at 287. The Forest Service should consult with the Fish and Wildlife Service about the impacts of authorizing OSV use on trails and areas that overlap with these species' and any designated critical habitat. Also, the Forest Service must demonstrate in this DEIS how it designated the OSV trails and areas so as to minimize impacts to these listed species and their designated critical habitat. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources. The Fish and Wildlife Service and NOAA Fisheries are being consulted on actions that may affect listed species.
83	85	Aquatics	The Sierra Nevada Yellow Legged Frog is as an endangered species with proposed critical habitat on the Lassen National Forest. 79 Fed. Reg. 24,256 (Apr. 29, 2014) (final listing rule); 78 Fed. Reg. 24,516 (Apr. 25, 2013) (proposed critical habitat). The Forest Service notes that historically the frog existed on the Lassen National Forest. DEIS at 284. Its current presence is unknown, but assumed. Id. Yet later in its analysis the Forest Service notes that because it is not suspected of occurring within areas currently or proposed for OSV use, the frog would not be affected. DEIS at 285-86. The Forest Service identifies five 5th field watersheds that represent the range of the species on the Lassen: Butte Creek, Yellow Creek, Upper Butte Creek, West Branch Feather River, and Middle North Fork Feather River. DEIS at 288. A map from page 289 of the DEIS shows the frog's range: Comparing Figure 10 with the proposed action, below (see DEIS at 20), there is significant overlap between the likely occurrences of the Sierra Nevada Yellow Legged from and OSV use on the Lassen National Forest (light green with no hatching): Due to the presence of this listed amphibian species, the proposed critical habitat, and the potential adverse effects of OSV travel, the forest should have formally consulted with the U.S. Fish and Wildlife Service as part of its winter travel planning process. See 16 U.S.C. Â§ 1536(a); C.F.R. Â§ 402.14(a). The Forest Service's obligations under the ESA are in addition to its executive order obligation to locate OSV areas and trails to minimize impacts to imperiled amphibians and their habitat. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources. We considered this in the development of the proposed action and alternatives. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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83	86	Aquatics	Aside from the possibility that OSVs may cause direct mortality through crushing or compaction of subnivean air spaces, OSV use can have a number of indirect adverse effects on amphibian species. For example, pollutants from OSV exhaust are deposited on and accumulate within the snowpack throughout the winter. See Attachment A at 12 (citing studies). During spring snowmelt those accumulated pollutants are released, causing elevated acidity levels in surrounding waterways and resulting in higher death rates for aquatic insects and amphibians. This is during a critical time when the species is breeding. DEIS at 287. Snow and soil compaction associated with OSV use can also have a number of adverse effects on soil and vegetation, and OSV use can result in crushing or trampling of sensitive riparian vegetation. Attachment A at 13. In addition to consulting with the Fish and Wildlife Service, the Forest Service should close any designated critical habitat as well as areas important for the Sierra Nevada Yellow Legged frog's recovery. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
136	12	Aquatics	Friends of Plumas Wilderness recommends that the Final Environmental Impact Statement include a more thorough analysis of OSV impacts on species that are likely to be adversely affected by OSV use, such as the Sierra Nevada Yellow-legged Frog (Rana sierra). Simply overlaying maps of the proposed OSV trails and areas in each alternative with critical habitat for Sierra Nevada Yellow-legged Frog would reveal which alternative minimizes impacts to this federally endangered species. Similar processes can be followed for all species of concern and areas of special consideration (i.e. sensitive vegetation types, archeological sites, etc.). The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
149	1	Aquatics	These are photos of wild steelhead from Butte Creek. The fisheries/aquatics report said there were not steelhead except in a very small part of the forest. Check your facts - you will need a reanalysis of this issue. Butte Creek headwaters are in the Jonesville area, the stream certainly could be impacted by OSV use up there. No steelhead distribution exists on Butte Creek within the Lassen NF. Upstream migration on Butte Creek is blocked by Centerville Dam, approximately 25 miles downstream of the forest boundary. The FEIS discloses the potential effects of all alternatives on soil and water resources. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
125	26	Coordination	There is no mention in the DEIS if the LNF Coordinated with any of the five Counties, as required by multiple laws and regulations. If Coordination occurred, it should be documented. If Coordination did not occur, the FEIS must state why that legal requirement was not fulfilled. We held and attended meetings and discussed the process with local county governments, and we considered their opinions in developing alternatives.

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143	5	Cultural Resources	we note that the project location may contain areas of historical, cultural, and/or spiritual importance to local tribes. We encourage the Forest Service to continue meaningful consultation with all potentially affected tribal governments throughout the process. We recommend that the results of consultations with tribal governments and with the Tribal Historic Preservation Office/State Historic Preservation Office be included in the FEIS. We have and will continue to consult with tribal governments, and tribal interested parties both under NEPA, Tribal Relations Consultation policy, and NHPA. This consultation and SHPO consultation is documented in the Cultural Resource Specialist Report and we considered their opinions in developing alternatives and mitigation measures.
125	23	Economics	In our comments to the NOIA, we requested the Forest Service to consider their own initiative titled "Thriving Communities" described in the 2015 Forest Service Budget, during the economic analysis. This initiative requires the Forest Service to work with communities within the National Forests to help strengthen their economies. We see no evidence in the DEIS that this document was included in the economic analysis. The economic analysis must also include the fact that within our communities there are several local dealers that can fully outfit an entire family with all the needed equipment and maintenance for OSV. These businesses support many families. Cross country and back country skiing does not bring in the volume of revenue that OSVs do. Will you add this to your economic analysis? Thank you for your comment. The Thriving Communities Initiative aims to provide recreational and commercial opportunities on National Forest System Lands to support rural employment and allow citizens to use and enjoy forest resources. Additionally, the initiative aims to support collaboration with communities adjacent to national forests. The economic impact analysis describes the contributions of winter outdoor recreation on the Lassen NF to local employment and labor income (DEIS pp. 371 and 373-380). All considered alternatives would continue to support diverse winter outdoor recreation opportunities and the associated local economic activity, consistent with both the 1992 Lassen National Forest Land and Resource Management Plan and the Thriving Communities Initiative. The Lassen NF OSV DEIS describes how the public was involved in the formulation of the DEIS: “The interdisciplinary team relied on public involvement to ensure that a full range of alternatives, representing a broad array of perspectives, would be analyzed in this draft environmental impact statement (DEIS)” (DEIS pg. 8). Therefore, the Lassen NF OSV DEIS satisfies the objectives of the Thriving Communities Initiative.

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152	8	Economics	Socioeconomics: You contend the surrounding communities will benefit from increased use of the forest by OSVs and there will be a socioeconomic detriment if acres are decreased for OSV use. We disagree with this argument and protest that this argument is always used. If there is more use by OSV users, there will be less use by non-motorized users. If there is more use by OSV users in the future due to lowering of standards for snow depth, future non-motorized users will not come to parts of the forest. There are more non-motorized users now doing "extreme sports" in the backcountry. Hiking up and skiing or snowboarding down; fat tire bikes, snow camping are popular with the younger population. Many of these users will exclusively go to Lassen National Park (LNP) to avoid any potential for OSV conflict. If more of the LNF was "closed unless designated open" to OSV use there is potential for more non-motorized use. These non-motorized users spend money in the surrounding communities also. Thank you for your comment. The economic analysis does not assume that more acres open to OSV use will increase economic activity. The analysis assumes that economic activity will be the same under all considered alternatives. Furthermore, the potential for user conflict between motorized and non-motorized winter recreation users is addressed in the analysis. For example, the socioeconomics section notes that “alternative 3 would improve quality of life for non-motorized winter recreation users relative to both the ‘no action’ alternative and the proposed action. The increase in acres closed to OSV use may alleviate some concerns expressed by non-motorized winter recreation users related to vehicle exhaust fumes, disparities in speed, noise, and competition for fresh powder. Although the miles of designated and groomed OSV trails would not change relative to current conditions, some OSV users may feel that the reduction in open acres adversely affects their quality of life” (DEIS pg. 377).
73	6	Economics	Forest Service economists have defined economic analysis areas for all national forests and grasslands using a protocol that identifies interactions between Forest Service resource management and local economic activity. Based on this protocol, the Lassen National Forest's economic area of influence encompasses Butte, Lassen, Plumas, Shasta, and Tehama counties. These five counties form the social and economic analysis area for the Forest's study regarding impact of changes to the current OSV regulations. The Lassen NF analysis states that an estimated 10,020 OSV visitors utilize the park's amenities annually, which benefits not only the recreationists, but also local businesses that provide supplies, food, and accommodations to users. The draft EIS states: "Much of the Lassen National Forest recreation visitor spending contributes to economic activity in travel and tourism-related sectors. These sectors include retail trade, passenger transportation, accommodation and food, and arts, entertainment, and recreation. Travel and tourism sectors account for a larger share of employment in the analysis area counties than in California overall. This suggests that the analysis area economy is reliant on tourism (including outdoor recreation). According to the report, the contribution of OSV use to local economic activity, and the potential for restrictions to decrease these economic contributions, was noted by a commenter: "It is critical that an economic analysis be completed as part of the environmental analysis...If the restrictions that are currently proposed in the NOI were implemented this year, there would be a great impact to local businesses and loss of jobs" {Sierra Access Coalition)." The Board agrees with this statement, and wishes to encourage additional tourism activity and the consequential economic benefit. Thank you for your comment.

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80	36	Economics	The DEIS also concludes that the closures included in Alternative 3 will not result in a negative socioeconomic impact25 and will not reduce snowmobile tourism or overall recreation opportunity. On the contrary, Snowlands and WWA believe that the additional restrictions included in Alternative 3, by significantly increasing nonmotorized recreation opportunity, will provide increased socieoeconomic benefits, given current trends in recreation demand.26 Thank you for your comment. The socioeconomic analysis describes the potential for alternative 3 to make non-motorized winter recreation on the Lassen NF more appealing, noting that "alternative 3 would improve quality of life for non-motorized winter recreation users relative to both the 'no action' alternative and the proposed action. The increase in acres closed to OSV use may alleviate some concerns expressed by non-motorized winter recreation users related to vehicle exhaust fumes, disparities in speed, noise, and competition for fresh powder. Although the miles of designated and groomed OSV trails would not change relative to current conditions, some OSV users may feel that the reduction in open acres adversely affects their quality of life" (DEIS pg. 377). However, defensible quantitative changes in motorized or non-motorized recreation visitation due to the selection of any of the alternatives under consideration cannot be estimated. Therefore, the potential for recreational opportunities on the Lassen NF to become more or less appealing to users are addressed qualitatively.
83	82	Enforcement	It should also consider increasing enforcement to minimize conflicts of use. It should develop an enforcement strategy to assure that snowmobiles will not violate motorized vehicle access limitations, and damage aquatic and terrestrial resources. Adequate enforcement funding is critical to having an effective policing and enforcement program that assures motorized access does not cause damage in restricted areas. We encourage the Forest Service develop and fund an effective enforcement strategy to assure that snowmobiles will not violate motorized vehicle access limitations. The FEIS analyzes the proposed action, action alternatives, and their associated authorized activities that would address the purpose and need. The FEIS does not analyze activities that are illegal because illegal activities would not address the purpose and need and would not be authorized by the decision. We acknowledge that although there may be some risk of OSV violations, the hazard of these violations resulting in adverse environmental consequences of any perceptible magnitude is negligible. The Forest Service actively pursues additional funding for enforcement efforts on the Lassen National Forest, and would pursue any additional funding opportunities that might become available.
128	17	Enforcement	The USFS should consider adding a design feature to all alternatives to pursue funding for law enforcement. The USFS does not need to promise how much funding they will get, but setting a target and voicing the intent to pursue grant money for enforcement would help the public see that the USFS is planning realistically. The enforcement target or strategy could be as simple as 1) apply for enforcement money from the State of California, 2) identify goals for law enforcement in most areas most weekends, and in some areas some weekdays. 3) if state funds become available, staff--up law enforcement in areas identified as a priority in step 2. Because, no matter what decision is chosen, the same widespread trespass that is so harmful to resources will continue on the ground without enforcement. The Forest Service actively pursues additional funding for enforcement efforts on the Lassen National Forest and would pursue any additional funding opportunities that might become available.

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83	83	Enforcement	Adequate resources must be devoted to user education and signage to promote public understanding of travel restrictions and improve compliance. This is facilitated through the publication of our winter recreation map and would be done in the OSVUM. Important information would also be provided at kiosks at each trailhead.
148	25	Enforcement	Sixth, application of the minimization criteria must take into account available resources for monitoring and enforcement of the designated system.16 To ease enforcement obligations and ensure user compliance in the first place, OSV designation decisions should establish clear boundaries and simple, consistent restrictions designed to minimize resource damage and user conflicts. This would be facilitated through the publication of our winter recreation map and would be done in the OSVUM. Important information would also be provided at kiosks at each trailhead.

83	79	Enforcement	Application of the minimization criteria must take into account available resources for monitoring and enforcement of the designated system. See Sierra Club v. U.S. Forest Serv., 857 F. Supp. 2d 1167, 1176-78 (D. Utah 2012) (NEPA requires agency to take a hard look at the impacts of illegal motorized use on forest resources and the likelihood of illegal use continuing under each alternative). As noted above, unauthorized OSV use has very real impacts. We reviewed the Memorandum Decision and Order in the case cited (857 F. Supp. 2d 1167 (D. Utah 2012)) and we determined that it is not analogous to the present analysis nor its decision. The Sierra Club case was based on a wheeled, motorized vehicle use designation analysis under Subpart B of the Forest Service's Travel Management Regulations. It dealt with the designation of trails for wheeled motorized vehicles and the threat that the creation of unauthorized routes posed on forest resources. The environmental consequences of unauthorized routes created for wheeled motorized vehicles are more substantial than unauthorized routes created by OSVs. "The difference in management of motor vehicle use and OSV use on NFS lands stems from differences in their associated settings, activities, environmental impacts, and public preferences. National forests and grasslands change when snow blankets the landscape. Vegetation camouflages, animals burrow, and water transforms into ice... OSV use occurs only in the months when snow is present, in contrast to other types of motor vehicle use, which can occur at any time of the year… 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 vegetation, whereas most other types of motor vehicles operate directly on the ground. Unlike other types of motor vehicles traveling cross-country, OSVs traveling cross-country generally do not create a permanent trail or have a direct impact on soil and ground vegetation… Subpart B of the TMR recognizes that cross-country travel [and, by association, unauthorized routes created by cross-country travel] by [wheeled motorized vehicles] is generally unacceptable [and the regulations are written to only permit such travel by wheeled motorized vehicles in specific circumstances]. Subpart C of the TMR [Travel Management Rule] as originally promulgated and in the proposed rule recognizes that cross-country travel by OSVs may be acceptable in appropriate circumstances" (79 FR 34679, June 18, 2014). As the District Court in the Sierra Club case stated in its Memorandum Decision and Order, "The test of adequacy of an EIS is to be 'pragmatic,' requiring 'a good faith attempt to identify and to discuss all foreseeable environmental consequences.'" After considering potential environmental impacts, we determined that illegal OSV trail creation and use is not a significant environmental issue. This is because although there may be some risk of OSV enthusiasts creating new OSV trails or going off-trail areas where OSV use is not allowed, the hazard of this activity resulting in adverse environmental consequences of any perceptible magnitude is negligible for several reasons: • Illegal trails generated by wheeled, motorized vehicles are likely to directly affect soil and vegetation; • Illegal OSV trails would exist on snow and are not likely to directly affect soil and vegetation; • OSVs would be prohibited from directly affecting soil, vegetation, and other surface resources by snow depth restrictions in each action alternative; • Because they disturb soil and vegetation, illegal trails generated by wheeled, motorized vehicles would exist for a longer duration of time; • Illegal OSV trails would only exist until the next heavy snowfall or snow melt, so the effects on the snow would be temporary;

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			• We have found very little evidence of illegal OSV use that would remain after the snow melts; • Illegal OSV use would not result in permanent routes because of the widely dispersed nature of off-trail, cross-country OSV travel. • The opportunity to create illegal trails by wheeled motorized vehicles is greater than for OSVs because: o Wheeled, motorized vehicle use is generally confined to designated trails. Generally, simply diverting off a designated trail would be an illegal use of a wheeled, motorized vehicle; o Although OSV trails would be designated, most of designations would be for areas where public, cross-country OSV use would be allowed. Therefore, there would be fewer opportunities for illegal OSV use except in areas not designated for OSV use.
136	16	Enforcement	The monitoring section of the OSV DEIS includes efforts to determine if "OSV use is not occurring in prohibited areas" and if "OSV use is restricted to designated routes", but there is no mention of law enforcement actions that will be taken if there are frequent trespass incidents or violations of riding off designated routes. Any OSV use not consistent with the designations made as a result of this analysis would be illegal. We would prosecute any illegal uses that we become aware of.
83	21	Enforcement	Unauthorized OSV use does occur, and is likely to continue on the Lassen National Forest. The Forest Service should analyze how designated OSV routes and areas may facilitate illegal use, thereby causing additional impacts to natural resources, wildlife, and habitat. In the very least, the Forest Service should seek to ensure user compliance, thereby reducing enforcement obligations. OSV designations should establish clear boundaries with simple, consistent restrictions designed to minimize resource damage and conflicts among uses. Failure to consider the risks of and impacts resulting from unauthorized OSV use is a fatal flaw in this analysis. Please see the response to letter 83, comment # 79. The existing winter recreation map for the Lassen National Forest shows the trails and areas where OSV use is allowed and has been effective in preventing impacts. Areas and trails designated for OSV use would also be identified on the OSVUM as a result of this analysis. We would prosecute any illegal uses that we become aware of.
83	22	Enforcement	Unauthorized OSV use is having and will have significant impacts that the analysis in the DEIS does not discuss. Sierra Club v. U.S. Forest Serv., 857 F. Supp. 2d 1167, 1176-78 (D. Utah 2012) (NEPA requires an agency to take a hard look at the impacts of illegal motorized use on forest resources and the likelihood of illegal use continuing under each alternative). The Forest Service assumes in this analysis that it only analyzed authorized OSV use in this DEIS. DEIS at 283. The Forest Service states that illegal OSV use could occur, but that it would be monitored and dealt with as a law enforcement issue. DEIS at 139 Please see the response to letter 83, comment # 79. The existing winter recreation map for the Lassen National Forest shows the trails and areas where OSV use is allowed and has been effective in preventing impacts. Areas and trails designated for OSV use would also be identified on the OSVUM as a result of this analysis. We would prosecute any illegal uses that we become aware of.

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83	12	Impacts	NEPA requires the Forest Service to take a hard look at the impacts from specific OSV trail and area designations on the Lassen National Forest. This section focuses on the Forest Service's duty to disclose direct, indirect, and cumulative impacts of its proposed action pursuant to NEPA. We are concerned that the Forest Service's failure to adequately consider the impacts of the proposed action pursuant to NEPA prevents meaningful public comment.3 The SEIS, as written, does not provide the necessary hard look at the direct, indirect and cumulative impacts of OSV use. This comment is addressed by the analysis in the FEIS.
125	28	Impacts	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. We believe 40+ years is enough time to conclude that OSVs do not damage the forest ecosystems. We have 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. Please respond to the fact that there has been no documentation of OSV damage for 40+ years. We agree. Neither of the significant issues pertains to damage to natural resources.
64	3	Info Request	Please contact me with the results as soon as they are published. The comment is noted.
125	17	Info Request	Please provide a response to this proposal, as well as the science that was used to determine adequate snow depth, so we can keep an open dialog with the forest. The comment is noted.
143	6	Info Request	When the FEIS is released, please send one hard copy and one CD to the address above (mail code: ENF-4-2). If you have any questions, please contact me at (415) 972-3521, or have your staff contact James Munson, the lead reviewer for this project. The comment is noted.
83	53	Minimization	air quality and noise monitoring is within the scope of the purpose and need for action. DEIS at 6 (stating "[o]ne purpose of this project is to effectively manage OSV use on the Lassen National Forest to [inter alia] . . . minimize impacts to natural and cultural resources, and minimize conflicts among the various uses."). OSV use negatively impacts air quality, a natural resource. Clean air is also a value quiet recreational uses tend to seek out in the forest, and therefore OSV use conflicts with that use in terms of its negative impacts on air quality. The Forest Service has no regulatory jurisdiction over air quality or noise. These levels are set by state law. The EIS examines effects of the proposed action and alternatives on air quality and ambient noise levels. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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83	54	Minimization	the Forest Service does have regulatory jurisdiction over air quality and noise. In addition to the agency's duty under its Forest Plan to maintain air quality to levels set by the Clean Air Act and state and local air quality regulations (see DEIS at 398), the minimization criteria impose a substantive duty on the Forest Service to, inter alia, "consider effects on . . . with the objective of minimizing . . . [c]onflicts between motor vehicle use and existing or proposed recreational uses." 36 C.F.R. Â§ 212.55(b). See also DEIS at 385 (noting the agency's duty to consider noise effects and designate OSV use with the objective of minimizing noise). Therefore air quality and noise from OSV use on the Lassen National Forest falls squarely within the Forest Service's jurisdiction. The Forest Service has no regulatory jurisdiction over air quality or noise. These levels are set by state law. The EIS examines effects of the proposed action and alternatives on air quality and ambient noise levels. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
80	76	Minimization	while we appreciate that the LNF included an analysis of impacts to air and water quality in the DEIS, we don't see where the Forest Service has actually applied these analyses in the decision-making process. The LNF could have used these analyses to determine appropriate boundary lines for OSV use areas (to minimize impacts to other uses, Class 1 airsheds, and water resources). Instead, it appears these analyses were simply cursory exercises. The only metric used to compare air and water quality impacts between the respective alternatives was the amount of acres open to OSV use in each alternative impacts on a granular level and not rely on a forest-wide reduction in open acres to satisfy the minimization criteria.43 We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	23	Minimization	The Forest Service should account for projected climate change impacts in its application of the minimization criteria and OSV designation decisions. See 77 Fed. Reg. 77,801, 77,828-29 (Dec. 24, 2014) (CEQ's revised draft guidance recognizing increased vulnerability of resources due to climate change and that "[s]uch considerations are squarely within the realm of NEPA, informing decisions on whether to proceed with and how to design the proposed action so as to minimize impacts on the environment, as well as informing possible adaptation measures to address these impacts, ultimately enabling the selection of smarter, more resilient actions."). Climate change considerations should include the potential for reduced and less reliable snowpack and increased vulnerability of wildlife and resources to OSV impacts. See Attachment A at 4-5, 10, 13. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
148	24	Minimization	Fifth, the Forest Service should account for predicted climate change impacts in its application of the minimization criteria and designation decisions.14 Already climate change is leading to reduced and less reliable snowpack and increasing the vulnerability of wildlife, soils, and water resources to disturbance, compaction, and pollution impacts associated with OSV use.15 The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.

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83	44	Minimization	The Forest Service must show how it designated OSV trails and areas with the objective of minimizing damage to soil, watershed, vegetation, and other forest resources. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
148	48	Minimization	Alternative 3 does take limited steps to minimize conflicts with other recreational uses and impacts on proposed wilderness areas by closing important areas for non-motorized winter recreation to cross- country OSV use, or limiting that use to designated snow trails. We support these proposals and believe they are necessary to create a balanced travel plan that satisfies the minimization criteria. The areas, however, cover only 68,430 acres (about 6% of the forest) and do not absolve the forest from applying the minimization criteria on the other 94% of the forest. The FEIS discloses all reasonable minimization measures, and discloses the area of the forest in which OSV use would not be designated for each alternative.
10	4	Minimization	The OSV Rule requires that designated routes and areas are located so as to minimize damage to natural resources, conflicts with other uses, and impacts to wildlife and wildlife habitat. This DEIS doesn't show how the open areas, or designated routes, in each Alternative are located in a manner that minimizes the impacts listed above. The final EIS should clearly describe how the location of each route and area complies with the minimization criteria We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
48	3	Minimization	the DEIS does not illustrate how each alternative minimizes damage to natural resources, use conflicts, and wildlife impacts which is a requirement under the OSV rule. Addressing this should be required prior to the USFS finalizing the EIR and selecting a course of action. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
80	2	Minimization	in the Environmental Impact Statement (EIS) the Forest Service is required to show how each specific route and area designated for OSV use has been selected to minimize damage to natural resources, minimize conflicts with other uses (including non-motorized recreation), and minimize impacts to wildlife and wildlife habitat. This draft EIS (DEIS) doesn't show how the open areas, or designated routes, in each Alternative are located in a manner that minimizes the impacts listed above. The EIS must show how route and area designations are in compliance with the minimization criteria and OSV Rule. This may result in a further narrowing of the areas designated for OSV use in Alternative 3. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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80	3	Minimization	While the LNF acknowledges the minimization criteria in the DEIS, it fails to explain how any of the alternatives apply or meet the minimization criteria.1 The minimization criteria were initially referenced in Executive Order No. 11644, 37 Fed. Reg. 2877 (Feb. 8, 1972), as amended by Executive Order No. 11989, 42 Fed. Reg. 26959 (May 24, 1977). They require the Forest Service, when designating routes and areas open to motorized travel, to: 1) minimize damage to soil, watershed, vegetation, or other resources of the public lands; 2) minimize harassment of wildlife or significant disruption of wildlife habitats; and 3) minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands. These minimization criteria were codified in the 2005 Travel Management Rule, as amended by the 2015 Over-Snow Vehicle Rule. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
80	18	Minimization	To properly apply the minimization criteria and meet the requirements of the OSV Rule, we suggest that the Forest Service take the following approach, and document each step in the FEIS: 1. Identify those areas where OSV use is prohibited12; cannot occur due to physical limitations13; and areas which are closed to motorized vehicles under the governing Forest Plan documents; as well as areas where OSV use is clearly incompatible with existing uses, such as administrative areas, operating campgrounds, and areas leased for other uses. 2. Identify areas where OSVs must be prohibited in order to meet the minimization criteria - including areas where this is conflict with non- motorized winter recreation14 and other areas where OSV use should not be allowed due to resource concerns.15 3. Determine where there is a demand for designated trails. If there is a demand for designated trails within the areas identified above, determine whether it is possible to locate trails in a manner that minimizes impacts, or locate trails outside of the areas identified above. 4. Determine appropriate boundaries for OSV open areas outside of the areas identified above. Locate open areas where there is a demand for OSV use and define boundaries based on identifiable features such as ridgelines, roads and rivers. All OSV use areas should have at least one public access point from an established and plowed parking area. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
80	65	Minimization	The application of the minimization criteria is critical to the designation of routes and areas. One of such criteria is the minimization of recreational use conflicts, as between motorized and nonmotorized uses. Other criteria include minimizing impacts to wildlife and to air and water quality. Designation of nonmotorized trailheads and imposition of BAT standards - both authorized by the rule37 - are important techniques that allow minimization of conflicts and are thus entirely within the scope of the DEIS. Although the utilization of such techniques may not be necessary where OSV use is highly restricted, this is not the situation on the LNF. Designation of nonmotorized trailheads and BAT restrictions are thus important tools that may allow the LNF to leave more areas open to OSV use while meeting the minimization criteria. Although the LNF can choose whether to use these more creative management tools or rely on more restrictive techniques, their use is clearly within the purpose and scope of the project. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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83	25	Minimization	We understand that properly applying the minimization criteria is a difficult task. The string of federal court cases invalidating prior Forest Service travel management decisions demonstrates the challenge.7 To satisfy this substantive duty, the Forest Service must meaningfully apply each minimization criterion to each area and trail being considered for designation. We are encouraged that the Forest Service recognizes it has a duty to consider the minimization criteria when designating OSV trails and areas. See, e.g., DEIS at 4, 7 (stating, as part of the purpose and need, to "minimize impacts to natural and cultural resources, and minimize conflicts among the various uses."). The agency's attempt at complying with that substantive duty, however, falls short. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	29	Minimization	the Forest Service confuses its duty to designate OSV trails and areas in a way that minimizes impacts to specific criteria, with efforts to mitigate impacts. The Forest Service fails to consider the best available scientific information or site-specific information. It does not include the type of "granular," area-by-area and route-by-route analysis that the Ninth Circuit held is required. And it fails to explain how the agency made decisions about OSV area and trail designations with the objective of minimizing impacts to natural resources, wildlife, habitat, and between motorized and non-motorized uses. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	30	Minimization	There is nothing in this DEIS documenting or explaining how the agency evaluated and applied the minimization criteria when it made the OSV trail and area designations proposed here. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	31	Minimization	To avoid conflating mitigation with minimization, the Forest Service should approach application of the minimization criteria in two steps. First, the agency should locate areas and routes in a way that seeks to minimize impacts. The agency should consider BMPs identified in the Winter Wildlands Alliance report, Attachment A. Only once the impacts have been minimized should the agency establish site-specific management actions to reduce or mitigate remaining impacts. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	32	Minimization	the Forest Service developed project design features and mitigation measures "to reduce or eliminate adverse impacts" from all of the alternatives. DEIS at 31. As an example of the mitigation measures, the agency proposed to coordinate the timing of trail grooming "to minimize impact on recreation experiences" and to "[c]onfigure [the] OSV system to minimize impact[s] on other resource values." Id. This is precisely the kind of confusion between mitigation and minimization that precludes the Forest Service from properly complying with its own regulations and the executive orders. In addition to the mitigation efforts outlined in the DEIS, the Forest Service should also consider the mitigation measures outlined in Attachment A. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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83	34	Minimization	Proper application of the minimization criteria requires the Forest Service to get out on the ground, gather site-specific information, and apply the criteria to minimize resource damage and user conflicts associated with each designated area and route. The agency has done some of its work here by reviewing recent scientific literature regarding impacts of OSV use on the forest. But it fails to provide current, site-specific information about the forest, OSV use, or OSV impacts on various forest resources. The specific locations of OSV area and trail designations are critical to understanding how those designations might impact natural resources or conflict with other uses. Yet the agency never analyzes the impacts of the specifically designated OSV areas and trails. Without this information, neither the agency nor the public can meaningfully evaluate the agency's proposed OSV designations. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	35	Minimization	Far from providing a more granular, site-specific analysis, here the Forest Service approaches the minimization criteria on the thousand-foot level, looking at the entire forest as a whole. As noted above, the Forest Service also improperly downplays the impacts from OSVs. Absent consideration of site-specific information and the best available scientific information, it is unlikely that the agency can demonstrate how it designated the OSV areas and trails with the objective of minimizing impacts to particular resources. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	37	Minimization	The analysis in the DEIS does not provide the necessary, more granular, site-specific analysis to designate snowmobile trails. We considered scoping comments and comments on the DEIS to develop minimization measures to consider in designating OSV trails. These measures are disclosed in the FEIS and would be implemented where necessary.
83	38	Minimization	The Forest Service provides no assessment of how the OSV trails and areas were designated to minimize impact. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	39	Minimization	the Forest Service recites the acres or miles of trails designated for OSV use forest-wide and, for example, the percentage of wildlife habitat impacted by OSV use forest-wide. See, e.g., DEIS at 160-161 (considering OSV use forest-wide among each alternative), 163-165 (comparing percentage of wildlife habitat impacted by OSV use forest-wide). This in no way explains how the Forest Service designated the trails and areas that are the basis of those acres, miles or percentages to minimize resource and recreational use impacts. "The language 'with the objective of minimizing' means that the whole goal or purpose of the exercise is to select routes in order to minimize impacts in light of the agency's other duties. Simply listing the criteria and noting that they were considered is not sufficient to meet this standard. Instead, the Forest Service must explain how the minimization criteria were applied in the route designation decisions." Guzman, 766 F.Supp.2d at 1074. The Forest Service's approach here misses the point of developing alternative OSV designations with the objective of minimizing impacts. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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83	41	Minimization	the Forest Service has failed to show that it took some action to minimize environmental damage when designating routes. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	42	Minimization	The Lassen National Forest must apply the minimization criteria to each designated trail (whether existing or proposed, groomed or ungroomed). When designated and placed on a map, trails focus the impacts of OSV use to those locations and generally increase the number of OSV users visiting an area. This is particularly true of groomed trails within areas otherwise open to cross-country travel. Groomed trails are desirable for traveling faster and further into remote areas. In addition, grooming often results in widening the footprint of a trail. The widened trail is then used in the summer (or sometimes even in the winter, by wheeled motorized vehicles resulting in additional impacts and conflicts). Moreover, the impacts associated with OSV use on designated trails extend beyond the trail corridor itself. As part of applying and implementing the minimization criteria, the Forest Service must address noise, air quality, habitat fragmentation, and other landscape-scale impacts associated with OSV trail use. This is especially important where proposed designated trails are adjacent to or in close proximity to designated Wilderness or other important conservation or recreational areas closed to motorized uses, since these designations may facilitate trespass into those areas. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. If a trail would be widened as the result of grooming, the impacts would be inconsequential because all groomed trails would be located on roads which are used in the summer by wheeled vehicles. The FEIS discloses the direct, indirect, and cumulative effects of the proposed OSV trail designations on ambient noise, air quality, habitat fragmentation and other landscape-scale impacts. Trespass of OSVs into non-motorized areas would not be authorized by this action. Any use of OSVs that would be inconsistent with the designations to be made by this decision would be illegal.
83	61	Minimization	The agency must not open to OSV use other areas identified through the NEPA process and application of the minimization criteria where impacts to forest resources or conflicts with non- motorized recreational users from OSV travel cannot be minimized. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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83	97	Minimization	This is the Lassen National Forest's opportunity to properly consider and apply the minimization criteria to protect natural resources, wildlife, habitat, and to reduce conflicts for the majority of public lands visitors who enjoy the natural landscape through quiet, non-motorized forms of recreation. To comply with the case law, plain language of the OSV rule, and ORV executive orders, the Lassen National Forest should modify its proposed action and alternatives, consider impacts of the alternative designations, and properly apply and implement the minimization criteria to designate areas and trails available for OSV use that minimize impacts to resources and conflicts between recreational uses. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
148	18	Minimization	In addition to generalized BMPs, application of the minimization criteria should incorporate any site- or resource-specific scientific information or analysis. For example, to effectively minimize the significant noise impacts associated with OSV use, the Forest Service should conduct soundscape modeling and incorporate the results of that modeling into its decision-making.12 Other site- or resource-specific information might include, for example, air quality modeling or monitoring; wildlife population, habitat, or monitoring data; or visitor use data. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
152	24	Minimization	We feel this DEIS does not protect, increase or enhance old forest ecosystems and the species dependent on them. It does not use minimization criteria to prevent disruption of wildlife, soil, watersheds and forest resources. The USFS has an opportunity to plan for a future with more population pressures on our National Forests. We believe there are simple measures that could be written into the final EIS to protect the forest for the benefit of future generations of Americans. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
136	35	Minimization	The Lassen OSV Draft EIS does not meet the "minimization criteria" specified in the 2015 OSV Rule The minimization criteria were codified in the 2005 Travel Management Rule, as amended by the 2015 Over-Snow Vehicle Rule. They require the Forest Service, when designating routes and areas open to motorized travel, to: 1) minimize damage to soil, watershed, vegetation, or other resources of the public lands; 2) minimize harassment of wildlife or significant disruption of wildlife habitats; and 3) minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
148	2	Minimization	While we applaud the Lassen National Forest for identifying and considering the impacts of OSV use on a variety of forest resources and uses, we remain deeply concerned that the proposed action and DEIS alternatives fail to comply with the plain language of the subpart C regulations and the executive order minimization criteria. We hope that the forest will correct these deficiencies, and we are eager to assist in that endeavor. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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148	10	Minimization	the Forest Service must get out on the ground, gather site-specific information, and actually apply the criteria to minimize resource damage and recreational use conflicts associated with each designated area and route. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
148	34	Minimization	Under the plain terms of the executive orders, the Forest Service must apply the minimization criteria to all trails designated for OSV use - even if those trails are located in areas of the forest that would be designated as open to cross-country OSV use. When designated and placed on a map, trails focus the impacts of OSV use to those locations and generally increase the number of OSV users visiting the area. This is particularly true of groomed trails within areas otherwise open to cross-country travel. Groomed trails are desirable for traveling faster and further into remote areas. In addition, grooming often results in widening the footprint of the trail. The widened trail may then be used in summer by wheeled motorized vehicles resulting in other impacts and conflicts. Moreover, the impacts associated with OSV use on designated trails extend beyond the trail corridor itself. As part of applying and implementing the minimization criteria, the Forest Service must address noise, air quality, habitat fragmentation, and other landscape-scale impacts associated with trail use. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. If a trail would be widened as the result of grooming, the impacts would be inconsequential because all groomed trails would be located on roads which are used in the summer by wheeled vehicles. The FEIS discloses the direct, indirect, and cumulative effects of the proposed OSV trail designations on ambient noise, air quality, habitat fragmentation and other landscape-scale impacts. Trespass of OSVs into non-motorized areas would not be authorized by this action. Any use of OSVs that would be inconsistent with the designations to be made by this decision would be illegal.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
148	41	Minimization	The DEIS does not demonstrate that the Forest Service has applied or implemented the minimization criteria in its proposed area or route designations. While many sections of the DEIS provide thorough discussions of the potential impacts of OSV use on forest resources and other recreational uses, such identification and consideration of impacts is insufficient to satisfy the minimization criteria. The DEIS lacks a "granular" area-by-area and route-by-route analysis demonstrating how proposed areas and trails are located to minimize those impacts.22 In other words, the Forest Service appears to have fallen into the common trap of treating the minimization criteria as just another procedural impacts analysis, when in reality it imposes a substantive obligation that significantly limits the agency's decision space. The forest may not rely on minor reductions in areas open to OSV use to satisfy its obligation to design a system that minimizes impacts. For instance, while we are pleased to see approximately 29,000 low- elevation acres (below 3,500 feet) and the 520-acre Black Mountain Research Natural Area23 closed to OSV use in the proposed action, those limited closures minimize impacts on less than 3% of the 1.15- million-acre forest. Binding Ninth Circuit precedent has explicitly rejected forest-wide reduction in the total area open to OSVs as a basis for demonstrating compliance with the minimization criteria; instead, the criteria are "concerned with the effects of each particularized area and trail designation."24 Yet much of the explanation in the DEIS relies on acreage comparisons.25 While this information is useful to include in the DEIS, it does not satisfy the minimization criteria. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. If a trail would be widened as the result of grooming, the impacts would be inconsequential because all groomed trails would be located on roads which are used in the summer by wheeled vehicles. The FEIS discloses the direct, indirect, and cumulative effects of the proposed OSV trail designations on ambient noise, air quality, habitat fragmentation and other landscape-scale impacts. Trespass of OSVs into non-motorized areas would not be authorized by this action. Any use of OSVs that would be inconsistent with the designations to be made by this decision would be illegal. Many reviewers of the DEIS expressed the opinion that the language in the Travel Management Regulations at 36 CFR §212.55(b) requires the decision to minimize damage, harassment, significant disruption, and conflicts to the extent that they would not occur at all. This interpretation is not correct. Following this interpretation, there would be no need to analyze alternatives because only one alternative – no OSV use – would satisfy this interpretation. The Department of Agriculture explained the appropriate interpretation of this requirement when it released its Travel Management Regulations in November of 2005: “An extreme interpretation of ‘minimize’ would preclude any use at all, since impacts always can be reduced further by preventing them altogether. 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).”

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148	49	Minimization	To properly apply the minimization criteria to the entire forest, the Forest Service must go back and identify those discrete areas and specific routes that are appropriate for OSV use and are located to minimize impacts and recreational use conflicts. This will require significant changes to the existing proposed action and DEIS alternatives, likely necessitating a supplemental DEIS.34 We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
148	50	Minimization	Proper application of the minimization criteria likely will result in additional acreage or routes closed in the following areas: * Additional low-elevation areas, thickly treed areas, windswept ridgetops, and other terrain generally inaccessible or ill-suited to OSV use closed. For instance, the DEIS recognizes that "the Front Country, Ishi Wilderness area, Almanor Ranger District, generally does [sic] not get sufficient snow for OSV use."35 * Ashpan in the Hat Creek Ranger District: low-elevation trailhead with unreliable snowpack, and leads to sensitive habitat for the California Spotted Owl and American marten near Thousand Lakes Wilderness. * Bogard in Hat Creek Ranger District: low-elevation trailhead with unreliable snowpack, and leads to the Butte Lake area and the Caribou Wilderness. * Swain Mountain: low-elevation with unreliable snowpack; leads to the Caribou Wilderness; cross-country ski trails in the area. * Fedonyer and Spalding in the Eagle Lake Ranger District: minimal snow in recent years and cross-country ski trails in the area. * Morgan Summit in the Almanor Ranger District: close to Lassen Volcanic National Park and very popular cross-country ski trails. Buffers around Heart Lake and Wild Cattle Mountains necessary to minimize impacts. * Jonesville in the Almanor Ranger District: very popular area leading to Humboldt/Humbug summit and rich habitat for Pacific marten; cross-country ski trails. * Lake Almanor: extremely low-elevation, leading to Humboldt/Humbug summit from the eastside; important habitat for American marten. * Areas around the Pacific Crest National Scenic Trail. The DEIS claims placing this area off-limits to OSV use is outside the scope of the project.36 If the forest follows the required closed unless designated open approach (see Section II, below), however, this simply means that areas around the PCT would not be designated for cross-country OSV use, which falls squarely within the purpose of designating a system of areas and trails in compliance with the subpart C regulations. Recommendations: Using the elements of the methodology described in section I(A), above, apply the minimization criteria to each area and trail (including those located in open areas) to identify a system that minimizes impacts. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS adds a non-motorized buffer zone along the Pacific Crest Trail to the proposed action. OSV use in this zone would be prohibited except on OSV trails designated to facilitate OSV crossing of the PCT.
83	5	Minimization	current winter management allows OSV use on almost 85% of the Lassen National Forest. Despite the stated purpose that includes minimizing impacts to natural and cultural resources, and minimizing conflicts among the various uses, the Forest Service is proposing little change to its winter travel management plan in this DEIS. It proposes to designate over 80% of the Lassen National Forest as open to OSV use. See DEIS at 3, 7 (explaining the proposal to designate 947,120 of the 1,150,020 forest acres for OSV use, 406 miles of trails for OSV use, and to groom 324 miles of those trails). Rather than maintain the status quo, the Forest Service should meaningfully re- evaluate the OSV designations the Lassen National Forest and propose a winter travel management plan consistent with its underlying substantive duties. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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148	5	Minimization	We are pleased to see that many sections of the DEIS provide a relatively thorough discussion of the impacts associated with OSV use. Unfortunately, the Forest Service has failed to apply that information and analysis to formulate a proposed action and alternatives that satisfy the requirements of the new subpart C regulations. To ensure that rule implementation is off to the right start and avoid the specter of litigation that has plagued summertime travel management planning, it is critical that the Lassen's OSV use designation planning process: * Satisfy the Forest Service's substantive legal duty to locate each area and trail to minimize resource damage and conflicts with other recreational uses - not just identify or consider those impacts. * Constitute discrete, specifically delineated open areas that transition the forest from its current default open status to a "closed unless designated open" status. * Ensures OSV designations do not prejudice recommended wilderness decisions in the upcoming Forest Plan revision. We are deeply concerned that the proposed action and alternatives in the DEIS fail to satisfy these and other requirements, as detailed below, and we hope to work with the forest to remedy these deficiencies. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
80	51	Minimization	While we appreciate that Alternative 4 would limit motorized use within the McGowan cross-country ski area, many other elements of Alternative 4 make this alternative untenable. As with Alternative 2, Alternative 4 continues to allow OSV use across the vast majority of the LNF with little regard for how this use may impact other uses, natural resources, or wildlife. Indeed, even the McGowan closure area would be undermined by the designation of a new OSV route within the area. The DEIS gives no reason for why this dead-end route surrounded by a non-motorized area should be designated. The DEIS also fails to describe how the location of this route meets the minimization criteria. Likewise, the DEIS does not explain why Alternative 4 would allow OSV use below 3,500 feet nor does it provide any explanation for how any of the OSV use areas have been located to meet the minimization criteria. The Forest Service must designate OSV use areas based on these criteria, and not just allow OSV use everywhere except where expressly prohibited28- to do otherwise is in direct contravention of the OSV Rule.29 We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
128	12	Minimization	All of the alternatives should minimize OSV impacts to marten and other wildlife species, as required. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
132	5	Minimization	While Alternative 3 provides a good starting point for a Preferred Alternative, the Forest Service must modify this Alternative 3 so that designated OSV routes and the boundaries of OSV open areas are located to minimize the impacts of motorized recreation. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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152	25	Minimization	In conclusion, 36 CFR 212.55b mandates that the LNF use Minimization criteria to minimize damage to soil, watershed, vegetation and forest resources. LNF is to minimize harassment to wildlife and significant disruption of wildlife habitats. The Lassen National Forest Land and Resource Management plan had the foresight to designated Habitat Management Areas and traveors for fur-bearers to "Maintain and enhance their populations where possible". The LRMP also requires the FS to protect, increase and perpetuate Desired Conditions of old forest and conserve species associated with these ecosystems. Alternative 3 is certainly are preference, but we cannot support it completely as written. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
136	2	Minimization	alternatives in the DEIS do not strive to minimize impacts to natural resources, wildlife and uses. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
80	46	Minimization	Alternative 2 (The Proposed Action) Alternative 2 fails to comply with the OSV Rule: it does nothing to minimize conflicts between uses, nor does it adequately meet the other aspects of the minimization criteria. While we appreciate that Alternative 2 would prohibit OSV use in areas of the forest that do not see substantial or consistent snowfall (areas below 3,500 feet) and would bring management of the Black Mountain Research Natural Area in line with the Forest Plan, Alternative 2 does not create a single area readily accessed from a winter trailhead where nonmotorized recreationists seeking a clean and quiet experience can recreate free from the impacts of OSVs. Instead, Alternative 2 continues to allow OSV recreation in areas of the LNF that have long been established for nonmotorized use. These areas - most significantly the McGowan and Colby areas, but also the area around the Bizz Johnson trail and the shoreline ski trails on Lakes Almanor and Eagle - contain trails that themselves are closed to OSVs, in recognition of the history and continuing importance of Nordic recreation in these areas. Indeed, the local OSV community largely (though not entirely) respects the nonmotorized nature of these areas. But the fact that some motorized users voluntarily avoid an area out of respect for nonmotorized users is not a reason to designate the area as open to OSVs-in fact, it argues for the opposite. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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80	33	Minimization	the Forest Service must analyze and minimize impacts associated with designating existing OSV routes that have not previously been subject to NEPA or the minimization criteria. To facilitate this required analysis and comply with NEPA, the EIS must include an alternative under which few, if any, areas and limited routes would be designated as open to recreational OSV use. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. Many reviewers of the DEIS expressed the opinion that the language in the Travel Management Regulations at 36 CFR §212.55(b) requires the decision to minimize damage, harassment, significant disruption, and conflicts to the extent that they would not occur at all. This interpretation is not correct. Following this interpretation, there would be no need to analyze alternatives because only one alternative – no OSV use – would satisfy this interpretation. The Department of Agriculture explained the appropriate interpretation of this requirement when it released its Travel Management Regulations in November of 2005: "An extreme interpretation of 'minimize' would preclude any use at all, since impacts always can be reduced further by preventing them altogether. 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)."
136	3	Minimization	none of the alternatives in the DEIS propose to close existing OSV trails to protect natural resources, improve wildlife habitat or reduce conflict between motorized and non-motorized winter recreation uses. The FEIS discloses the analysis of impacts to natural resources, wildlife habitat, and non-motorized recreational opportunities potentially resulting from these designations for each alternative.
148	74	Minimization	the Lassen's proposed action and DEIS alternatives generally ignore the first step of designing the system to avoid impacts in the first instance. Nevertheless, the DEIS does identify certain project design features, based on the Forest Service's National Best Management Practices for Water Quality, to further minimize impacts associated with area and route designations.50 Although they do not satisfy the requirement to locate areas and trails to minimize impacts, we support these measures, which are generally consistent with the best management practices identified in the attached Snowmobile Best Management Practices report. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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148	17	Minimization	application of the minimization criteria should be informed by the best available scientific information and associated strategies and methodologies for minimizing impacts to particular resources.9 Winter Wildlands Alliance recently published a comprehensive literature review and best management practices (BMPs) for OSV use on national forests.10 The BMPs provide guidelines, based on peer-reviewed science, for OSV designation decisions that are intended to minimize conflicts with other winter recreational uses and impacts to wildlife, water quality, soils, and vegetation. The Forest Service's National Core BMP Technical Guide also includes relevant BMPs, such as imposing minimum snow depth and season of use restrictions; using applicable best practices when constructing OSV trailheads, parking, and staging areas; and using suitable measures to trap and treat pollutants from OSV emissions in snowmelt runoff or locating stating areas at a sufficient distance from waterbodies to provide adequate pollutant filtering.11 The Forest Service should incorporate the Winter Wildlands Alliance and National Core BMPs into its winter travel planning decisions. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. National Core BMPs would apply to any alternative selected.
148	73	Minimization	The Forest Service should also incorporate other relevant mitigation measures and best management practices identified in the report, including: * Encourage, incentivize, or require Best Available Technology for OSV noise and emissions controls, particularly in sensitive or high-conflict areas. * Where possible, designate separate trailhead/parking/staging areas for OSV open areas and high-demand OSV routes, and locate those areas away from high-value and sensitive resource areas. Separate motorized and non-motorized trailheads should be established where possible in shared use areas. * Ensure adequate design and maintenance of designated routes, including bridges, culverts, and roadbed to reduce hydrological and erosion impacts during spring run-off. * Restrict use by class or type of OSV as necessary to minimize impacts. * Provide public education and outreach. * Monitor and enforce closed routes and areas, seasonal restrictions, and minimum snow depths. Minimum snow depths should be reported regularly on the forest website, with measurements taken at established locations that are representative of varying snow depths based on factors such as wind, orientation, slope, tree cover, etc. * Establish an adaptive management framework that utilizes monitoring to determine efficacy of current management. These measures may be necessary to satisfy the minimization criteria, and therefore are not outside the scope of the project. Recommendations: After designating a system of areas and trails located to avoid impacts and conflicts in the first instance, the Lassen should apply and consider additional best practices to further reduce impacts. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. National Core BMPs would apply to any alternative selected.
83	28	Minimization	compliance with the executive orders and TMR is not clear from the administrative record provided here. The FEIS discloses how the Forest Service would comply with the Travel Management Regulation which is based on the executive orders.

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80	79	Minimization	the analyses of impacts to soil resources, botanical resources, and wildlife fail to meet the intent of a travel planning analysis. While the Forest Service describes the natural history of affected species in great detail across the board, and discusses the myriad of ways OSVs can impact soils, when it comes to comparing alternatives the Forest Service defaults to comparing acres open to OSVs. The DEIS contains no mention of how each specific OSV use area and each specific designated route within each alternative impact these resources, nor is there any discussion of how any of these routes or areas have been located to minimize these impacts. This is the main purpose of a travel planning EIS and the LNF has missed the mark completely. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
83	15	Minimization	The Forest Service must consider the best available science.4 This includes a December, 2014 report by Winter Wildlands Alliance providing a comprehensive literature review and best management practices (BMPs) for OSV use on national forests. See Winter Wildlands Alliance, Snowmobile Best Management Practices for Forest Service Travel Planning: A Comprehensive Literature Review and Recommendations for Management (Dec. 2014) (Attachment A) (providing best management practices (BMPs) as guidelines, based on peer-reviewed science, for OSV designation decisions made to minimize conflicts with other winter recreational uses and minimize impacts to wildlife, water quality, soils, and vegetation). See also Mullet, T.C., Effects of Snowmobile Noise and Activity on a Boreal Ecosystem in Southcentral Alaska (Nov. 2014) (Attachment B). The Forest Service must consider these studies when analyzing the direct, indirect, and cumulative impacts of OSV use on the Lassen National Forest. Where information is lacking or uncertain, NEPA requires the Forest Service to make clear that the information is lacking, the relevance of the information to the evaluation of foreseeable significant adverse effects, summarize the existing science, and provide its own evaluation based on theoretical approaches. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
83	36	Minimization	The Forest Service has a substantive duty to minimize impacts associated with OSV use for both area and trail designations. Minimization of impacts associated with OSV area allocations is particularly important because the OSV rule permits the Forest Service to designate larger areas open to cross-country travel than in the summer travel planning context. The Forest Service's own rules define "areas" designated for ORV use as "discrete, specifically delineated space[s] that [are] smaller, and, . . . in most cases much smaller, than a Ranger District." 36 C.F.R. Â§ 212.1. Here, however, the Forest Service has proposed to designate over 80% of the forest open to OSV use. It states that it considered the suggestion to establish areas designated for OSV use using the minimization criteria, and modified the proposed action in Alternative 2 in response. DEIS at 34. But we are unable to find a break down of the different "areas" designated by the Forest Service. Instead, the Forest Service consistently takes a forest-wide approach to its analysis throughout the DEIS. See, e.g., DEIS at 415 (Table 146, reviewing air quality impacts from Alternative 1 forest- wide), 418 (Table 148, reviewing air quality impacts from Alternative 2 forest-wide), 420 (Table 149, same for Alternative 3), 421 (Table 150, same for Alternative 4). The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.

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136	8	Minimization	We strongly advocate that the forest apply "minimization criteria" by analyzing impacts to natural resources, wildlife habitat, and other current and potential uses. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
137	6	Minimization	The OSV Final Environmental Impact Statement should focus its analysis on this smaller portion of the Forest where OSV use actually occurs and minimize impacts to natural resources, wildlife and other forest uses. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
148	19	Minimization	proper application of the minimization criteria must address both site-specific and larger-scale impacts.13 For example, the Forest Service must assess and minimize landscape- scale impacts such as habitat fragmentation; cumulative noise, and air and water quality impacts; and degradation of wilderness-quality lands and associated opportunities for primitive forms of recreation. The agency also must assess and minimize site-specific impacts to soils, vegetation, water, and other public lands resources, sensitive wildlife habitat, and important areas for non-motorized recreation. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
80	8	Minimization	The Forest Service must show not just that impacts have been studied, but specifically demonstrate how effective each of the Alternatives presented in the DEIS is in minimizing impacts from OSVs. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
148	11	Minimization	effective application of the minimization criteria must include meaningful opportunities for public participation and input early in the planning process.8 In many cases, public lands users and other stakeholders are the best source of information for identifying resource and recreational use conflicts. The Forest Service must affirmatively address and minimize identified impacts and conflicts when making area and route designation decisions. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
80	47	Minimization	The DEIS discussion of OSV impacts makes clear that mere prohibition of OSVs from ski trails is not sufficient to mitigate most OSV impacts, including, noise, emissions, and disproportionate consumption of powder snow. The LNF has not stated a single reason why OSV recreation (beyond travel on the designated OSV routes provided by Alternative 3) should continue to be permitted in these areas that are cherished by local cross-country skiers and visitors seeking a clean and quiet recreation experience. It is clear from the DEIS that permitting OSV use within these areas would fail to meet the Forest Service's substantive duty to minimize conflict between uses. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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83	71	Minimization	Designating motorized use along recommended wilderness reduces wilderness potential and compromises wilderness values. Noise, air quality, viewshed, and other impacts associated with OSV use can greatly diminish the experience of non-motorized users. See Attachment A at 5-8. Areas of high value for non-motorized winter recreation should be closed to OSV travel. These areas may occur across all Recreation Opportunity Spectrum categories, including roaded natural, rural, and urban areas that may have a wholly different character in the winter and provide excellent winter recreation opportunities. To designate areas and trails in a way that minimizes conflicts among the various uses of the forest, the Forest Service must first identify routes and areas where there is ongoing conflict between motorized and non-motorized winter recreational use. Attachment A at 8. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of OSV use near non-motorized areas.
83	72	Minimization	Where there is evidence of conflict among uses anywhere on the Lassen National Forest, the Forest Service has a duty to designate OSV trails and areas so as to minimize those conflicts. In its discussion of impacts from groomed trails, the Forest Service states that there are no known conflicts with populated areas. This ignores reports of where authorized OSV use in areas adjacent to Lassen National Park and the Caribou Wilderness has led to incursions into these forest areas that should be off limits to motorized use. See U.S. National Park Service, Lassen Volcanic National Park Rangers Charge Snowmobile Riders for Trespassing in the Park (March 30, 2009) (copy attached as Attachment G). The Forest Service should provide adequate buffers around important non- motorized areas and trails where OSV travel is prohibited to minimize noise and other impacts. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of OSV use near non-motorized areas.
83	74	Minimization	Additional impacts the Forest Service should consider when trying to minimize conflicts among uses include changes to the landscape that result from snowmobile tracks, documented illegal motorized entry into non-motorized areas, locations where enforcement of closed areas or trails is logistically more difficult, and unsafe behavior of some motorized recreationists that endangers non-motorized recreationists. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of OSV use near non-motorized areas.
83	75	Minimization	The Forest Service must show how it designating OSV trails and areas on the Lassen National Forest to minimize conflicts among different classes of motor vehicle uses within the forest and on neighboring federal lands. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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125	29	Minimization	At times reports of conflict between OSV and non-motorized users have been reported, largely on an anecdotal level. We suggest that conflict is largely defined by the person, and one person with a particular intolerance for either motorized or non-motorized recreation alike can exaggerate claims trying to create disharmony within those communities. This has served to bring the Forest Service in as moderator into an argument that is emotionally, rather than factually, based. The OSV Plan implies a level of conflict that simply does not exist on the LNF. Attempting to solve a non-existent problem with an unenforceable plan only results in anger and mistrust of the Forest Service. We considered scoping comments and comments on the DEIS to develop measures that would minimize conflict between motorized and non-motorized winter recreation enthusiasts. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of OSV use near non-motorized areas.
80	58	Minimization	We believe the best way for the Forest Service to meet the non-motorized mandate of Pacific Crest Trail, and thus satisfy the travel planning requirement to minimize conflicts between OSV use and recreational uses of the same or neighboring federal lands, is to designate OSV use areas that do not border the trail except in those limited places with designated crossing points. Again, just as we have emphasized elsewhere in these comments, the Forest Service must apply the minimization criteria first and then determine the boundaries of appropriate OSV use areas. The proposed action has been modified to include a non-motorized corridor along the Pacific Crest Trail. The impacts of OSV use on the PCT are disclosed in the FEIS. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of OSV use near non-motorized areas.
83	69	Minimization	The Forest Service must show how it designated OSV trails and areas with the objective of minimizing conflicts between OSVs and other existing or proposed recreational uses of the forest. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of OSV use near non-motorized areas.
83	76	Minimization	The OSV plan and corresponding NEPA analysis should address the non-OSV over-snow uses that are already occurring on the forest, and should anticipate and provide a process for addressing future over-snow uses through updates to the plan. Failure to address these ongoing and foreseeable uses of the forest that may be impacted by OSV designations would result in both an inadequate NEPA analysis and inadequate minimization of conflicts with other uses. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of OSV use near non-motorized areas. If monitoring discovers a need for changes to the selected alternative, those changes will be implemented.

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83	78	Minimization	The Forest Service should consider whether to designate areas or trails by "class of vehicle" or "time of year," as provided by the OSV rule. 36 C.F.R. Â§ 212.81(a). The regulation allows forests to tailor their designation decisions to account for snowfall patterns and different and evolving OSV technologies, and to minimize corresponding social and environmental impacts. The DEIS should also include an evaluation of and prescriptions for how the plan will be consistent with the land use plans for the nearby federal lands. For example, the Forest Service must show how it designated OSV groomed trails in close proximity to the Lassen Volcanic National Park boundaries in a way that minimizes conflicts among uses. This is especially concerning given the reports of snowmobile trespassing into the National Park in violation of federal regulations. See Attachment G. Plus, the DEIS should ensure and declare that the winter travel plan is consistent with these other plans. The FEIS discloses the potential impacts of OSV use near non-motorized areas.
148	45	Minimization	the DEIS concludes that all of the action alternatives minimize conflicts between motorized and non-motorized uses "to some degree by designating a clear system of OSV trails and areas, and development of the subsequent OSV use maps that will allow visitors to choose areas to recreate that will best meet their expectations and desired settings."28 This is merely a statement of the regulatory requirement to designate a system for OSV use and display it on a map. That action alone does not show compliance with the minimization criteria, which must be applied to identify the designated system. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
148	118	Minimization	The Lassen National Forest must plan for OSV use in the larger winter recreation context to effectively minimize conflicts with other recreational uses. This should include: (1) adopting Snowlands Network and Winter Wildlands Alliance's reasonable proposals for non-motorized winter recreation areas; (2) meaningfully addressing and incorporating non-motorized winter recreation opportunities into the proposed action and DEIS alternatives; (3) meaningfully addressing current and potential future over-snow uses that may not satisfy the definition of OSV; and (4) addressing unauthorized wheeled off-road vehicle use on snow trails. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS analyzes an alternative submitted by Snowlands Network et al.
136	36	Minimization	The Lassen OSV DEIS Proposed Action does not minimize conflict between uses as it allows motorized use in areas popular for non-motorized winter recreation. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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136	38	Minimization	No alternative proposes closing OSV trails to protect natural resources, improve habitat or minimize conflict With over 400 miles of snow trails and 976,760 acres where cross-country OSV use is currently allowed, winter motorized recreation on the Lassen National Forest has undoubtedly displaced winter visitors seeking experiences where they can find clean air and quiet. The OSV DEIS states that designating trails and areas for OSV use has the potential to generate noise and emit pollutants into the air. However, no alternatives outlined in the report propose to close existing OSV trails or areas to protect natural resources, improve wildlife habitat, minimize conflict between motorized and non-motorized winter recreation or enhance opportunities for quiet and solitude. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
136	37	Minimization	the Proposed Action does not adequately buffer Wilderness, Proposed Wilderness, National Park lands and Congressionally designated non-motorized trails from the impacts of air and noise pollution caused by adjacent OSV use. By encouraging OSV use adjacent to Lassen Volcanic National Park, Wilderness areas, Proposed Wilderness and National Recreation Trails, the Forest Service is increasing the potential incidence of illegal trespass and conflict between motorized and non-motorized winter visitors. The FEIS considers one alternative that neither increases OSV use near non-motorized areas, nor increases the potential of illegal trespass and conflict between motorized and non-motorized users. The FEIS discloses the impacts of the alternatives on non-motorized recreational opportunities.
80	20	Minimization	The DEIS states that each Alternative includes groomed trails within one-quarter mile of Wilderness and Proposed Wilderness boundaries but does not describe how the location of these particular trails impacts these designated areas, nor does it provide any explanation of how these trails have, or could, be located to minimize impacts. Likewise, the DEIS provides no discussion of how designated OSV use areas bordering Lassen National Park, designated Wilderness, Proposed Wilderness, or other areas with non-motorized designations will impact these areas, or how the boundaries of OSV use areas have been located to minimize impacts to other land management uses or recreational uses. DEIS page 389 discloses temporary impacts of noise to Wilderness and the PCT. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of OSV use near non-motorized areas.

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148	47	Minimization	Other information in the DEIS highlights identified impacts and conflicts that have not been minimized. For instance, the DEIS acknowledges the adverse impacts that OSV use can have on soil productivity and stability, yet proposes to designate tens of thousands of acres for cross-country travel on sensitive soils, with minimum snow depth restrictions that are not supported by the best available science (see Section I(C), below).31 Indeed, the DEIS acknowledges that the proposed minimum snow depth of only 6 inches on designated trails "may potentially create conditions in which the road surface is exposed to OSVs and there is potential for some soil erosion or rutting of the road surface."32 Due to the proposed reduction in minimum snow depth on designated trails, the DEIS impacts analysis concludes that the no action alternative (which is not being seriously considered because it would not satisfy the purpose and need to implement the new subpart C regulations) would best protect water resources due to the risk of trail disturbance and associated hydrological impacts under the action alternatives.33 We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of the alternatives on sensitive soils and watershed resources.
83	46	Minimization	In designating routes with the objective of minimizing impacts on water quality, the Forest Service should consider restricting stream and lake crossings by OSVs, and avoid designating OSV trails and areas in close proximity to surface waters. The agency explains that it developed a prohibition on OSV use on open or flowing water. DEIS at 41. But this approach ignores the impacts to surface water quality from OSV use over frozen or snow covered streams or lakes. The Forest Service acknowledges that "[m]any waterbodies are directly accessed or crossed by the trails and many more can be accessed by off-trail cross-country riding." DEIS at 75. It lists some of the major waterbodies accessible by OSVs, including North Battle Creek Reservoir, Crater Lake, McCoy Flat Reservoir, Silver Lake, Caribou Lake, Cho Lake, and Lake Almanor. DEIS at 76. Yet the agency fails to provide a more granular analysis of where those crossings occur, and it does not consider how those designations might be made so as to minimize the impacts on water quality. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of the alternatives on sensitive soils and watershed resources.

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83	49	Minimization	The Sierra Nevada Forest Plan Amendment includes standards and guidelines for riparian conservation areas that are intended to minimize the risk of activity-related sediment entering aquatic systems. DEIS at 65. It established riparian conservation area widths of 300 feet on each side of perennial streams, 150 feet on each side of intermittent and ephemeral streams, and 300 feet from lakes, meadows, bogs, fens, wetlands, vernal pools, and springs. Riparian Conservation Objective 4 requires the Forest Service to ensure that management activities within these areas "enhance or maintain physical and biological characteristics associated with aquatic- and riparian-dependent species." DEIS at 66. Considering the impacts of OSV use on water quality (described in section one, above), and consistent with the "Standard and Guideline 116," the Forest Service should avoid any OSV water crossings and apply the riparian conservation area buffers when designating OSV trails and areas so as to minimize impacts to water quality. See also Attachment A at 14 (recommending a buffer of at least 150 feet to minimize impacts to water quality, soils, vegetation, and wildlife). The Forest Service has failed to show how it designated OSV trails and areas with the objective of minimizing impacts to water quality. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the potential impacts of the alternatives on sensitive soils and watershed resources.
83	50	Minimization	Options for mitigating these impacts include, inter alia, ensuring maintenance of bridges and culverts to prevent erosion during spring run-off and monitoring routes and areas to ensure measures taken are effectively mitigating impacts to water quality, soils, and vegetation. The FEIS discloses the potential impacts of the alternatives on sensitive soils and watershed resources.
83	60	Minimization	The Forest Service must show how it designated OSV trails and areas with the objective of minimizing harassment of wildlife or significant disruption of wildlife habitats. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	62	Minimization	the Forest Service must designate OSV areas and trails to avoid impacts to wildlife and reduce conflict with proposed and existing uses. In addition, the agency must also analyze OSV use adjacent to these areas where such use invites trespass into closed or restricted areas. We considered scoping comments and comments on the DEIS to develop minimization measures to minimize impacts to wildlife. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the impacts of the alternatives on wildlife and non-motorized uses.
83	63	Minimization	The DEIS fails to show how it designated the trails and areas in the four alternatives with the objective of minimizing harassment of wildlife and significant disruption of wildlife habitats. Snowmobile sound levels average around 71 decibels (dB) at 50 meters from the source. Mullet, T.C. (2014), Attachment B at 23-24. Snowmobiles moving across landscapes, including remote wilderness areas, while emitting noise may have compounding effects on wildlife stress and distribution, and OSVs may even unintentionally "chase" animals in response to noise. We considered scoping comments and comments on the DEIS to develop minimization measures to minimize impacts to wildlife. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the impacts of the alternatives on wildlife and wildlife habitat.

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83	64	Minimization	The Forest Service should start its analysis by determining how much of the areas and trails proposed to be open to OSV use under each alternative have actually been used by snowmobiles. Where there is overlap between the range of a species and OSV areas (where OSV use is effectively cross-country), the Forest Service should limit OSV use to designated trails. The Forest Service should also close areas that cover important wildlife habitat to OSV travel. This includes nesting and denning areas, migratory corridors, watersheds and waterbodies containing important spawning habitat, designated or proposed critical habitat, and habitat identified in recovery plans. As emphasized above, the Forest Service has a duty to minimize the effects of its designations, not just demonstrate that it changed the number of acres open to OSV use across the entire forest. We considered scoping comments and comments on the DEIS to develop minimization measures to minimize impacts to wildlife. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS discloses the impacts of the alternatives on wildlife and wildlife habitat.
148	44	Minimization	the DEIS considers the impacts of OSV use on sensitive wildlife like the Sierra Nevada red fox and Pacific marten by assessing whether OSV use would lead to a loss of viability or a trend toward federal listing of the species.26 While such an assessment may be required under other federal environmental statutes, it does not address whether adverse impacts to the fox have been minimized, as required. As the comments submitted by wildlife biologist Darca Morgan on behalf of The Wilderness Society, Winter Wildlands Alliance, Snowlands Network, and Center for Biological Diversity show, the best available scientific information demonstrates that OSV use in fox, marten, and other sensitive wildlife habitat on the Lassen National Forest will likely have significant adverse impacts on the species. Those impacts must be minimized, not just analyzed or considered. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
83	68	Minimization	Although consultation not required on warranted but precluded species, the Fish and Wildlife Service asked the Stanislaus National Forest to consult for their OHV travel plan. The Forest Service must consider the locations of the Sierra Nevada red fox and designate its OSV trails and areas so as to minimize harassment of the fox or disruption of its habitat. The analysis in the DEIS fails to show whether or how the agency did that. The FEIS discloses the impacts to Sierra Nevada red fox. The results of consultation for this species are in the FEIS.
136	15	Monitoring	We strongly support education and monitoring efforts specified in the DEIS that will be included with the implementation of OSV travel management on the Lassen National Forest. Thank you for your comment.

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152	22	Monitoring	It is disturbing to read in some places that, "monitoring is recommended", (page 359) regarding meadows, compaction and rutting. "Restrictions will be implemented and considered in areas where antler shed gathering is popular/concentrated." If there are known problems monitoring should be done, not simply recommended. Restrictions should be implemented now if antler shedding areas are known! "As time and funds allow" - page 32 regarding the need for more education of OSV users. "Consider additional signage". Time and funds should be part of all alternatives. Education and signage should be part of all alternatives. We are planning for a future with more population. We are planning to decrease conflicts among more users. Do not "consider or wait until time and funds allow" - make this all part of the Final EIS. On page 21 of the Wildlife BE/BA it says, "monitoring will be done based on available resources". Monitoring needs to be written into the budget and be part of the EIS. The FEIS clarifies the monitoring and mitigation measures that would be applied.
136	18	Monitoring	We urge that the final OSV EIS include standards for monitoring indicators. A monitoring plan will be developed after this decision is issued.
156	16	Recreation	Please post all OSV routes as closed to wheeled vehicles. OSV routes are closed to wheeled vehicles from 12/26 – 3/31. We keep those routes open prior to 12/26 for public Christmas tree cutting.
153	5	Recreation	As shown on the Lassen's current Winter Recreation Guide map I recommend that a route for snowmobilers be designated from the Goumaz Road along the north side of Hog Flat so they could travel parallel to and south of Highway 44 to the west side of Hog Flat and then continue south to Lassen National Forest Road 30N06 that is groomed for snowmobile use. "(his would form a loop for snowmobilers around Hog Flat since the groomed roads on the east and south sides of Hog Flat are already part of the designated snow trails for snowmobiles. The proposed action would not designate ungroomed OSV routes if they would already be located in an area that would be designated for cross-country OSV use. Alternative 4 would designate approximately 80 miles of ungroomed OSV trail in areas that would be designated for OSV use.
156	18	Recreation	ROC requests the LNF include the following routes in the EIS for Subpart C to create a seamless transportation system for OSV travel from Mineral to connect with the Swain Mountain trailhead. Include this section in the NEPA for this Subpart as a more efficient way to get this portion of the Share the Dream trail completed. The proposed action would not designate ungroomed OSV routes if they would already be located in an area that would be designated for cross-country OSV use. Alternative 4 would designate approximately 80 miles of ungroomed OSV trail in areas that would be designated for OSV use.

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156	19	Recreation	Looking at additional OSV trails to be analyzed through this process we are submitting the following trails with attachments to show the route. Attachment #4 - Shows the McGowan Lake Road from 31N17 to the intersection of 29N60Y (ULA177) where route turns south and connects with 29N36. Go east about one half mile and turn south at the OSV diamonds and go down to Hwy 36. From here OSV's can cross Hwy 36 and access the groomed trail system in the Morgan Summit area. Attachment #5 - From the Morgan Summit trailhead (29N67) going to the first saddle and turning east on 29N32 to the power line going east. While the power line road does not have a system number, there is a road all the way down to Hwy 172 and across this state route all the way to Mill Creek. A recreational bridge would be required to cross the stream staying out of the streambed and then following a partial skid trail up a slight grade to 29N25. This road takes you out to Hwy 36 where you can either go across the road to 29N10Y which wraps around the backside of the old Childs Meadows Lodge. Attachment #6 - Shows connection with the trail on the north side of the road that goes to Wilson Lake Road. Once at Wilson Lake Road, which is a county road and open to OSV use, you go north to Rice Creek Road and turn to the west (29N18). Stay on Rice Creek Road to Domingo Springs where you are on the Plumas County Road 311, and continue to 29N38 to 29N42 to Plumas County road 318 and go north to 29N74 turning east and then south. When getting to 29N36Y follow this road until it connects with 30N72. Road 29N36Y effectively ends at the center of section 6, but could continue as an overland route up the draw until it reaches 30N72. This last portion creates a seamless transportation system and is the last section needed to connect the two OSV areas together. Attachment #7 - Rice Creek Road west of Domingo Springs, to 29N38 east of High Bridge, is Plumas County Road 311 open to all uses. At 29N38 go north to 29N42. All road outlined in red needs to be analyzed for OSV use. Attachment #8 - Getting up the Mud Creek Rim - All of 29N36Y from 29N42 to the end of the physical road and then on up the drainage to connect with 30N72 needs to be analyzed for OSV use. End of routes to be analyzed on the south side of the LVNP for connectivity to Swain Mountain Trailhead. Part of this recommendation is already being considered in an alternative. Several of these proposed routes are not under NFS jurisdiction. However, the Forest Service could take no action to legally preclude the use of these routes by OSVs.
137	5	Recreation	I urge the Forest Service restrict OSV use to the watersheds that encompass existing snowmobile trail networks. We are protecting watersheds where there are any resource concerns.
152	7	Recreation	The trail at Lake Almanor also would rarely have enough snow for OSV use and conflicts between users would be frequent and potentially dangerous. The FEIS modifies alternative 2, which would not designate this trail for OSV use.
111	2	Recreation	Designation of a managed shared use area on the east side of the Lassen NF (close to Susanville) where snowmobiles are limited to travel on designated routes and the use of cleaner and quieter (best available technology) snowmobiles is encouraged, in order to improve ski and snowshoe opportunity in the Susanville area. Use of this trail is addressed in alternative 2. Enforcing the requirement to use best available technology is outside the agency's jurisdiction.

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156	1	Recreation	1. To designate 406 miles of National Forest System snow trails on National Forest System lands within the Lassen National Forest for OSV use when snowfall depth is adequate for that use to occur. We would like to see several areas where routes or roads are added to the mileage and indicated on the map, but not groomed. The proposed action would not designate ungroomed OSV routes if they would already be located in an area that would be designated for cross-country OSV use. Alternative 4 would designate approximately 80 miles of ungroomed OSV trail in areas that would be designated for OSV use.
135	8	Recreation	Designating the Butte Lake Road as non-motorized will lead to more skiing and snowshoeing opportunities to access a national park. This is addressed in alternative 3.
135	3	Recreation	Also, as it would be onerous for the USFS to require the cleanest-running snowmobiles on the market to access the LNF, signage encouraging the Best Available Technology (BAT) would be appropriate at trailheads. The imposition of best available technology requirements is outside the scope of the purpose and need for action, The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The regulation of best available technology, whether only encouraged or mandated, is outside the scope of this analysis. The Forest Service has no regulatory jurisdiction over air quality or noise and there are no Forest Service directives requiring the establishment of standards. Therefore this feature will not be included in alternative 3 to be analyzed in detail.
83	51	Recreation	The Lassen National Forest does not require best available control technology (BAT) for OSVs, even though the use of BAT has been shown to result in lower carbon monoxide and hydrocarbon emissions. DEIS at 414. The agency should require BAT for OSVs on the Lassen National Forest as one way to mitigate the impacts. The imposition of best available technology requirements is outside the scope of the purpose and need for action, The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The regulation of best available technology, whether only encouraged or mandated, is outside the scope of this analysis. The Forest Service has no regulatory jurisdiction over air quality or noise and there are no Forest Service directives requiring the establishment of standards. Therefore this feature will not be included in alternative 3 to be analyzed in detail.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
156	2	Recreation	2. To designate 947,120 acres of National Forest System lands within the Lassen National Forest as areas where cross-country OSV use is allowed when snowfall depth is adequate for that use to occur. Please look at potential paved roads where wheeled vehicle use can occur and eliminate OSV use from those roads. OSVs typically don't share paved roads with wheeled vehicles. OSVs avoid paved roads with insufficient snow. Wheeled vehicles avoid paved roads covered by snow deep enough to operate an OSV on.
8	1	Recreation	In reviewing the written DEIS information on Subpart C I have found some serious errors. On page 30, Figure 5, map of alternative 4, this map shows the entire area above Mineral described on the legend as OSV Use Prohibited Under Alternate 4 (OSV Use Prohibited). This is a grave error and needs to be changed immediately. There is NO WAY the OSV community would allow this popular riding area to be closed for OSV use. There is a designated XC ski route through part of this area on the McGowan Lake Road but except for that this whole area is open to OSV use. This issue has been addressed by correcting alternative 4 in the FEIS to more accurately reflect the recommendation received in scoping.
8	2	Recreation	Another error here is the legend for the hatched area. It states, "OSV Use Prohibited under Existing Management and Alternative 4 (OSV Use Prohibited)". At no time did the OSV community, in creating this alternative, allow any reduction in opportunity. If any of these hatch marks are for other than wilderness areas it must be changed so as to not indicate that we allowed any closures. This issue has been addressed by correcting alternative 4 in the FEIS to more accurately reflect the recommendation received in scoping.
135	6	Recreation	Fredonyer Pass Road (29N46) The snowmobile parking lot, restroom and informational kiosk makes this an excellent area for managed-share use. I have cross-country skied the Fredonyer Pass Road countless times, and have also benefitted from the grooming of the snow surface. Just a Â½ mile off the road to skier's left offers some great backcountry skiing. A backcountry skier can "skin" up towards the basaltic ridges and the cell phone towers and enjoy many steep, yet short, runs. This area would be appropriate as a non-motorized zone. The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for this particular trail as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.
135	7	Recreation	Hog Flat (north of 30N03 - Goumaz Rd.) This area is probably the easiest and closest ski and snowshoe access from Susanville to the Lassen National Forest. The cross-country skiing atop the frozen base of Hog Flat Reservoir, or along the shoreline provides superb wintry views of the forest and nearby mountains. Designating the Hog Flat Reservoir area north of 30N03 as non-motorized is appropriate under managed-shared use. The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for this particular trail as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
135	5	Recreation	The non-motorized area that I propose would be the Diamond Mountain Ridge east of the prominent rock outcrop located in the center of the Diamond Mountain Ridge. Diamond Mountain Ridge (south and above 29N43) Though not included in Alternative 3, I would like to see the eastern ridge of the Diamond Mountains designated as non-motorized. The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for this particular trail as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.
130	2	Recreation	The BLBSA abuts the National Park boundary on its northern and northeastern extremity. LAVO wilderness is within Â½ mile of some of the OSV areas, and could be impacted by noise and trespass. Reducing the acres available for OSV use would increase solitude in the park, and suppressing trespass would contribute to the undeveloped and natural character of the LAVO and Caribou wildernesses. Consequently, the NPS recommends that in preparing the Final EIS, consideration be given to including the BLBSA as an action "common to all" alternatives, or include it as a component of Alternative 2. This concern is addressed in alternative 3.
125	7	Recreation	SAC supports 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. Snow depth concern, elevation restrictions, and the desire for no new non-motorized areas are addressed in alternative 1. The proposed action would not designate ungroomed OSV routes if they would already be located in an area that would be designated for cross-country OSV use. Alternative 4 would designate approximately 80 miles of ungroomed OSV trail in areas that would be designated for OSV use. The PCT crossings in alternative 2 are consistent with the crossings identified for motorized use under Subpart B of the Travel Management Regulations.
85	1	Recreation	I would like to state that I support Alternative #4 with the following concerns: 1) All restricted areas to be well marked/posted. 2) Do not prohibit OSV use below 3500 feet. Useage below 3500 feet is small and this would be overly restrictive and cannot be effectively managed. The OSV operator cannot ascertain his or her elevation and the Forest will never be able to post all of it. Therefore, it would be like the CHP enforcing the speed limit on I-5 without first posting the speed limit on signs. 3) Snow depths as it relates to grooming. The groomers are provided by the State of California. Therefore, I strongly suggest the Forest follow the guidelines already established and being effectively used throughout the state. Boundaries of designated OSV areas will show on the OSVUM. Areas off-limits to OSV use would be posted if time and funding allow and if monitoring determines posting would be necessary. The other points are addressed in alternative 4. The Lassen OS trail grooming program will continue to follow the state's operating standards.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
45	1	Recreation	I encourage the Forest Service to adopt Alternative 3 which protects a handful of areas for human powered recreation as well as helping to minimize impact to wildlife and wildlife habitat. Even this alternative, however, needs some modification to actually designate OSV open areas and boundaries to minimize the impact of motorized activity. Boundaries of designated OSV areas will show on the OSVUM. Areas off-limits to OSV use would be posted if time and funding allow and if monitoring determines posting would be necessary.
48	1	Recreation	I feel that Alternative 3 should strongly be considered by the LNF staff as the preferred alternative. This alternative protects non-motorized recreation areas while simultaneously protecting motorized vehicular access. Prior to approval of Alternative 3, I ask the LNF staff to ensure designated OSV routes are located to minimize the impacts of motorized recreation. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
50	1	Recreation	As a frequent non-motorized user of the Lassen National Forest I strongly urge you to adopt alternative three. Although not perfect I feel it offers the best balance between motorized and non-motorized used. However I also think that alternative three should be modified so it makes clear how motorized and nonmotorized uses will be kept separate and how the alternative will minimize the impact on wildlife and other natural resources. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
63	3	Recreation	While Alternative 3 provides a good starting point for a Preferred Alternative, the Forest Service must modify this Alternative 3 so that designated OSV routes and the boundaries of OSV open areas are located to minimize the impacts of motorized recreation. The final EIS should clearly show how the minimization criteria were applied to each OSV route and open area. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
136	13	Recreation	Of the alternatives outlined in the Lassen OSV DEIS, Alternative 3 does the best job of conserving natural resources; protecting wildlife and wildlife habitat; maintaining the integrity of Wilderness, Proposed Wilderness and National Recreation Trails; and minimizing conflict between motorized and non-motorized winter recreation. Friends of Plumas Wilderness strongly supports Alternative 3 with modifications outlined below that minimize impacts to natural resources, wildlife, and conflict between uses. We urge the Forest Service drop the 22 miles of ungroomed snow trail that bisect the Butte Lake Backcountry Solitude Area and prohibit OSV travel on Primary Forest Route 17 immediately adjacent to the McGowan Frontcountry non-motorized area (shown in bold below). The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for this particular trail as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
156	10	Recreation	ALTERNATIVE 4 - OSV COMMUNITY PROPOSAL See changes made to the Proposed Action that best reflects ROC's desired outcome in this DEIS. Please make requested changes to map on page 30 of the Draft Environmental Impact Statement to reflect the OSV community's desire for management of the area at McGowan Lake (Attachment #3 with comments). This concern is addressed in alternative 4.
73	5	Recreation	The Board is in complete opposition to Alternatives 2 and 3, believing there is ample non-motorized trails and open areas under the current plan; especially closure of the Colby Mountain area, for the following reasons: 1) This area is currently managed by the Butte Meadows Hillsliders in partnership with The US Forest Service, Butte County, Plumas County, and Sierra Pacific. This collaboration is an excellent, sustained example of a goals contained in the 1992 Lassen National Forest Land and Resource Management Plan (LRM P): * Provide stable and cost-efficient road and trail systems (pg. 4-3); * Provide a wide-range of outdoor recreation opportunities to meet public demand (pg. 4-4); * Provide diverse opportunities for off-highway vehicle recreation (pg. 4-4); * Provide diverse opportunities for winter sports (pg. 4-4); and * Work in partnership with local communities to expand recreational facilities, programs, and trails on both public and private land (pg. 4-5). 2) To operate and manage the Jonesville Snow Park the Hillsliders must coordinate with all of these stakeholders. Unlike other parks, the Hillsliders pay all expenses incurred at the park. This includes plowing of roads to the park, the parking lot, and maintaining equipment purchased by the Hillsliders, including toilets. The Hillsliders pay liability insurance which also covers the cross country skiers when they venture on Sierra Pacific Industries' land. This has been going on for over 25 years with Hillslider's money and volunteers. When the original snow 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. 3) The Snow Park has become more popular over the years and the Hillsliders have continued to manage this and make improvements. The number one usage, according to available data, is snowmobiling and number two is snow-play for families. In the third spot is cross country/snowshoeing, which is followed by mountain biking. The Hillsliders have managed this Snow Park for all stakeholders for many years. If the current program has worked for so long it should stay the same. No funds are received from Lassen National Forest for the operation of the Snow Park. This park would not operate without the Hillsliders volunteers and money. 4) Because of the varied and plentiful opportunities in the LNF it is a destination area for many people from out of the area. The counties surrounding this Forest 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. Thank you for your comment.

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156	14	Recreation	The map included with Alternative 3 showed several areas that the XC ski community has requested as designated non-motorized. The east area at Hwy 36 and 44 would be a great non-motorized area with shared use on the trails. The area indicated as non-motorized on the north side of LVNP needs to be adjusted on both the east and west side (see attachment #2 map labeled Butte Lake XC ski area). The east side needs to be moved to go directly north of the very eastern boundary of the park all the way to Hwy 44. To the west from the 32N21 road, the boundary should be the top of the Hat Creek Rim from Hwy 44 to the park boundary with the exclusion of the potential OSV route for the Share the Dream Trail. That route has yet to be determined in that area. Their request to restrict OSV uses at the parking area at the Willard hill snow area would interfere with OSV safety and needed access to service the groomer. If the weather is so inclement as to prohibit the use of helicopter extraction of an injured OSVer from the Diamond Mountain Area, this the most strategic point to meet emergency services. Also, in heavy snow accumulation the groomers can meet fueling trucks here and enable the machine to have enough fuel to return to the Groomer Shed. OSVers, non motorized users, and snow players at the adjacent sled hill have been using this facility for 23 years without conflict and should continue to do so. Thank you for your comment.
153	1	Recreation	Please add my following recommendations for designation of a few small non motorized areas to those combined alternatives. My recommended non-motorized areas are: Hog Flat south of Highway 44 and west of the GoÂµmaz Road; the ridge south of Fredonyer Pass extending approximately 3 miles to Hamilton Mountain and the slopes on the east and west side of the ridge down to the designated snowmobile trails at the base of each side of this ridge; and the eastern three snowfields/bowls on Diamond Mountain. I have included a map of these areas. The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for these particular areas as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.
153	12	Recreation	Diamond Mountain snowfields are the signature visual feature of the west end of the Honey Lake Valley and the area around Susanville. They provided a scenic backdrop to our community and tell us if we are having a good winter by how much wind deposited snow builds up in the bowls on the north side of Diamond Mountain. I truly hope the Lassen National Forest staff recognize the undeveloped scenic value of those snowfields to our community and manage those areas to retain the undeveloped look and feel of that scenic ridge. The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for this particular area as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.
82	6	Recreation	It is important to have the traditionally non OSV areas of McGowan, Colby, shoreline areas at lakes Almanor and Eagle, and the area surrounding the Bizz Johnson trail closed to OSV use. OSV users have done a great job of respecting the designated Nordic trail areas however it is important to have these areas officially closed to OSV use -in addition to the trails in these areas. This concern is addressed in alternative 3.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
153	4	Recreation	Since the purpose of your Over Snow Vehicle management plan is to also designate some non-motorized areas ,I recommend this easy to get to and gentle flat terra in as a good place for beginner and intermediate skiers to enjoy without snowmobiles using the same area. Snowshoers also enjoy using this area. I recommend designating all of Hog Flat except the area within a 1/8 mile of Highway 44 be designated as non-motorized. The purpose is not to designate non-motorized areas The purpose and need for action in these designations is to "effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses" The Travel Management Regulations require that we designate "over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for this particular area as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.
153	6	Recreation	By designating Hog Flat as non-motorized, this would provide an area that is already popular with skiers and is close to town that could be provided for folks who want to go to an area they know is non-motorized. And this designation would hopefully keep snowmobilers who are looking for a place to run at high speed across open meadows off Hog Flat {there are many other open meadows for cross country speed runs west of Hog Flat). The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for this particular area as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.
153	7	Recreation	I support continuing the non-motorized designation of the Bizz Johnson Trail from Westwood Junction east to the east end of the Lassen National Forest boundary approximately 1.75 miles west of Highway 36 at Devil's Corral (note that 8.5 miles of trail from the Forest boundary east to Richmond Road in Susanville is public land managed by BLM; revise the Bizz Johnson Trail mileage listed on Lassen National Forest in the winter recreation guide to reflect this and show how much is on BLM). In winter, many skiers and some snowshoers enjoy traveling west from Devil's Coral up the Bizz Johnson Trail into Lassen National Forest and back. With the groomed snowmobile trail from the Highway 44 to Goumaz and on up to Fredonyer Pass, cross country skiers also benefit from the grooming by being able to ski on the compacted snow to Goumaz from Highway 44 (3 miles) or from Highway 36 (6 miles) on Fredonyer Pass and then ski east down the Bizz Johnson Trail to Devil's Corral (another 6 miles). None of the alternatives change the non-motorized nature of the trail segments mentioned.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
153	10	Recreation	I recommend that the eastern three snowfields on Diamond Mountain be designated non-motorized. That would be starting with the snowfield directly north of the prominent rock outcrop in the center of the Diamond Mountain ridge and continuing east to the end of the snowfields. Some of us local skiers refer to those three snowfields (from east to west) as Basque Bowl (old sheepherder carvings on the aspens), Cabin Bowl (an old cabin below the bowl) and Holiday Bowl (because we've skied there on some holidays). Over many years of skiing on those snowfields, I have not seen snowmobile tracks in those snowfields. I have seen snowmobile tracks in the western snowfields over toward Diamond Mountain itself and so expect that that use would continue and would not be impacted by a non motorized designation on the eastern three snowfields The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for these particular areas as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.
153	11	Recreation	For relatively close to town slopes for non-motorized telemark skiing I recommend designating the ridge south of Fredonyer Pass that leads up to Hamilton Mountain. Fredonyer Pass is the highest pass near Susanville (5700+ feet) and therefore is the "go to" place for snow other than the snowbelt east of Lassen Park that extends out to Hog Flat area. South of Fredonyer Pass there are natural openings along the ridge that that extends approximately 3 miles to Hamilton Mountain. The natural openings become snowfields in the winter and are steep enough for good telemark skiing (steeper slopes are needed to make turns in deeper snow). These snowfields begin about .5 miles south of the pass and continue to Hamilton Mountain 3 miles south of the pass. Because they are relatively close to Highway 36 they do not require a long approach to get to them. The simplest approach is to ski south from the snowmobile parking lot on the groomed trail/road approximately .6 miles then turn left and ski east and upslope to the snowfields. The slopes are also good when corn snow conditions develop. I recommend that this small area between the groomed snowmobile trails on the east and west sides of this ridge be designated a non-motorized area for back country skiing. This area would extend from south of the snowmobile trail over the south side of Fredonyer Pass approximately 3 miles south up to but not including the summit of Hamilton Mountain. This would allow for motorized access to the communication site on Hamilton Mountain. Ihave skied on these slopes south and north of Fredonyer Pass since the late 1970's, before the snowmobile parking area was built on the west side of Fredonyer Pass. The comment fails to identify a site-specific resource concern or reason for the agency to consider this suggestion for these particular areas as an alternative way to effectively manage public OSV use, provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. The suggestion was not considered for alternative development. However, it can be considered in the future.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
125	1	Recreation	The DEIS only considers two classifications for OSV travel: 1) Groomed Trails/Roads 2) Cross Country Travel We propose adding another classification which has significantly different issues than cross country: 3) Ungroomed roads. The proposed action would not designate ungroomed OSV routes if they would already be located in an area that would be designated for cross-country OSV use. Alternative 4 would designate approximately 80 miles of ungroomed OSV trail in areas that would be designated for OSV use. Roads are not being designated for OSV use in this analysis. There may be OSV trails that overlay roads, but they would be designated as trails. Although only 0.1 mile of trail to be designated in the proposed action does not overlay a road or trail used by wheeled vehicles, all routes designated for OSV use would be designated as trails.
156	15	Recreation	Please look at potential paved roads where over snow wheeled vehicle recreational snow play can occur while not eliminating tradition OSV use. Provided the snow is deep enough, OSVs can run on paved roads as long as they are either in an area open to OSV use or on a trail designated for OSV use. The FS has no jurisdiction over some paved roads because they are owned by county or state entities.
2	1	Recreation	I don't see any alternative to increase the area of OSV use, only alternatives to decrease it. Thank you for your comment.
80	31	Recreation	While we are not suggesting that the LNF must adopt such a restrictive alternative, consideration of such an alternative is necessary for a robust analysis. Both Alternatives 3 and 4 present alternatives that purport to present a fair balance of motorized use consistent with other objectives, rather than presenting an alternative that disfavors motorized recreation. For instance, under none of the alternatives considered would the LNF designate less than 76%20 of the forest as open to cross-country motorized travel or less than 324 miles of groomed OSV trails. Thus, the LNF has not fulfilled its obligations under either NEPA or the Forest Service winter travel management rule. The requirement to consider a full range of alternatives is also set forth in the Settlement Agreement, and thus the LNF has also failed to fulfill its obligations under the Settlement Agreement. As the DEIS is currently written, there are very few differences between alternatives, as is evidenced in the various tables throughout the DEIS where one is supposed to be able to compare how each alternative affects different resources. In almost every table each column is identical, making a comparison between alternatives, or robust analysis of any single alternative, nearly impossible. There were no issues driving the development of additional alternatives than what are analyzed in the FEIS.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
83	6	Recreation	This DEIS should include an alternative under which no areas or routes would be designated as open to recreational OSV use, or at least an alternative that considers a scenario where a majority of the forest is designated closed to OSV use.2 This alternative is necessary to provide an accurate comparison for analysis of the impacts associated with all of the trail and area designations proposed in this action-including those allowing continued OSV travel in existing areas or on existing trails. The Forest Service states that it eliminated consideration of this type of proposal because it did not meet the purpose and need "to provide a manageable, designated OSV system of trails and areas for public use." DEIS at 37. Yet the no action alternative, which the Forest Service retained in this analysis as Alternative 1, also would not meet the statement of purpose and need because the current management approach on the forest is not in compliance with the agency's own rules. The agency recognizes that OSV travel is a legitimate use of the national forests. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses.” A reasonable alternative must address the purpose and need for action. An alternative that prohibits OSV use on all of the Lassen National Forest would be an action alternative because an action would be required to prohibit OSV use on the Lassen National Forest. However, a “no OSV use” action alternative would not address the purpose and need for action, and was therefore not considered reasonable.
83	8	Recreation	Unlike in a typical NEPA analysis where the no action alternative provides the baseline for comparison, the no action alternative for most winter travel planning efforts reflects a current management status quo that is illegal according to the Forest Service's own regulations applying a closed unless designated open regime. Therefore the Forest Service should include an alternative under which a majority of the forest is designated closed to OSV use. The agency recognizes that OSV travel is a legitimate use of the national forests. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses.” A reasonable alternative must address the purpose and need for action. An alternative that prohibits OSV use on all of the Lassen National Forest would be an action alternative because an action would be required to prohibit OSV use on the Lassen National Forest. However, a “no OSV use” action alternative would not address the purpose and need for action, and was therefore not considered reasonable.
83	10	Recreation	The Forest Service should also consider an alternative that limits OSV use only to designated trails, prohibiting OSV use in areas. An alternative to limit OSV use to designated trails and prohibit OSV use in areas would be inappropriate. We also have not identified issues driven by user conflicts or resource concerns that would require that we restrict OSV use to that degree or to drive the development of additional alternatives than are already being analyzed in depth.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
83	11	Recreation	None of the alternatives considered in this DEIS provide for a considered comparison about the impacts of designating the proposed OSV trails or the proposed grooming of trails. To provide a reasonable range of alternatives, the Forest Service must include an alternative that reduces the number of miles of trails designated for OSV use. Currently, there is no range of alternatives among the four alternatives. See, e.g., DEIS at ix (proposing 406 miles of OSV trail in all four alternatives). In the same vein, the agency must consider an alternative that reduces the impact of groomed OSV trails in close proximity to the Caribou Wilderness, Caribou extension proposed Wilderness, Mill Creek Proposed Wilderness, and Thousand Lakes Wilderness boundaries. Currently, there is no variation among the four alternatives with regards to impacts of OSV groomed trails on nearby wilderness or proposed wilderness. See, e.g., DEIS at x, xi. This fails to provide a reasonable range of alternatives, which in turn precludes meaningful analysis. The agency recognizes that OSV travel is a legitimate use of the national forests. A reasonable alternative must address the purpose and need for action. An alternative in which no areas or routes would be designated for OSV use would not address the purpose and need for action. Under the minimization criteria, we have already identified areas of concern and restricted OSV use in those areas. In preparing the FEIS, we determined that there are additional areas below 3,500 feet on the Lassen National Forest than what we determined in the DEIS. Therefore, in alternative 3, these additional areas will not be designated for OSV use.
83	45	Recreation	The lack of differences among the alternatives highlights that this DEIS lacks a reasonable range of possible actions for meaningful comparison. It also prevents the agency from coming anywhere close to meeting the Ninth Circuit's standard, to apply data on an area-by-area basis and designate trails with the objective minimizing impacts. The agency recognizes that OSV travel is a legitimate use of the national forests. A reasonable alternative must address the purpose and need for action. An alternative in which no areas or routes would be designated for OSV use would not address the purpose and need for action. Under the minimization criteria, we have already identified areas of concern and restricted OSV use in those areas. In preparing the FEIS, we determined that there are additional areas below 3,500 feet on the Lassen National Forest than what we determined in the DEIS. Therefore, in alternative 3, these additional areas will not be designated for OSV use.
91	1	Recreation	The alternatives studied in the Lassen National Forest Over-snow Vehicle Use Designation Draft Environmental Impact Statement do not represent a range of alternatives. The "no action" alternative does not represent a "reasonable" alternative because the Lassen National Forest cannot choose this alternative. The remaining 3 alternatives all consider additional closures to OSV use. A range of alternatives would include at least one alternative that considers additional openings to OSV use. NEPA requires us to consider a “no action” alternative, even if we cannot select it. We also have not identified issues driven by user conflicts or resource concerns that would require that we further open the forest to OSV use or drive the development of additional alternatives than are already being analyzed in depth.

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121	8	Recreation	LNF must offer at least one actionable alternative which retains the existing OSV snow depth staging and use allowance, and also sets a clean standard for unbound off-trail cross-country OSV recreation. (At this late stage in the process, I suppose it will be necessary for LNF to formulate its singular action to include these features). This is the minimum necessary to avoid a destructive normalization of unseasonal (avoidable) OSV impacts to LNF resources and to the multiple (varied) uses of those resources. We have developed alternatives that address these concerns and they will be analyzed in depth.
148	89	Recreation	The DEIS range of alternatives does not satisfy NEPA. The alternatives range between opening 878,690 acres (approximately 76% of the forest) under Alternative 3 and 976,760 acres (approximately 85% of the forest) under Alternative 1 to cross-country OSV use. However, the bottom 75% of the range is missing.64 This scenario is similar to the situation in California v. Block, where the Ninth Circuit invalidated an EIS that "uncritically assume[d] that a substantial portion of the [roadless] areas should be developed and consider[ed] only those alternatives with that end result."65 Here, the DEIS assumes that a substantial portion of the areas currently open to OSV travel should be designated and considers only those alternatives with that end result. A reasonable range, by contrast, would designate between 0 and 878,690 acres of the forest as open to OSV use. The story is similar with respect to proposed trail designations, with each of the alternatives designating between 406 and 408 miles of snow trails for OSV use and no alternatives designating substantially less than the status quo. The agency recognizes that OSV travel is a legitimate use of the national forests. A reasonable alternative must address the purpose and need for action. An alternative in which no areas or routes would be designated for OSV use would not address the purpose and need for action. Under the minimization criteria, we have already identified areas of concern and restricted OSV use in those areas. Alternative 3 does not designate areas below an elevation of 3,500 feet for OSV use. In preparing the FEIS, we determined that there are additional areas below 3,500 feet on the Lassen National Forest than what we determined in the DEIS. Therefore, in alternative 3, these additional areas will not be designated for OSV use.
148	96	Recreation	The Forest Service must analyze a true range of alternatives, including one or more alternatives that would designate less than 76% of the forest as open to OSV use, properly apply the minimization criteria, and not prioritize that OSV use over other uses. An adequate NEPA analysis also requires an alternative that would designate no areas or routes as open to recreational OSV use. Development of these alternatives would likely necessitate preparation of a supplemental DEIS. The agency recognizes that OSV travel is a legitimate use of the national forests. A reasonable alternative must address the purpose and need for action. An alternative in which no areas or routes would be designated for OSV use would not address the purpose and need for action. Under the minimization criteria, we have already identified areas of concern and restricted OSV use in those areas. In preparing the FEIS, we determined that there are additional areas below 3,500 feet on the Lassen National Forest than what we determined in the DEIS. Therefore, in alternative 3, these additional areas will not be designated for OSV use.

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80	32	Recreation	An alternative that truly favors nonmotorized recreation could be similar to the LNF's current restrictions on wheeled vehicle use: it would designate specific routes for OSV travel that do not interfere with nonmotorized recreation, and would designate extremely limited areas where OSV travel is permitted cross- country. Such alternative might have strong reasons for adoption as the preferred alternative and, moreover, would demonstrate that Alternate 3, in fact, strikes a fair balance between over-snow motorized and nonmotorized recreation. The agency recognizes that OSV travel is a legitimate use of the national forests. A reasonable alternative must address the purpose and need for action. An alternative in which no areas or routes would be designated for OSV use would not address the purpose and need for action. Under the minimization criteria, we have already identified areas of concern and restricted OSV use in those areas. In preparing the FEIS, we determined that there are additional areas below 3,500 feet on the Lassen National Forest than what we determined in the DEIS. Therefore, in alternative 3, these additional areas will not be designated for OSV use.
83	9	Recreation	an alternative that designates no areas or trails to OSV use is necessary to facilitate a fully informed decision about the impacts of each action alternative. The agency recognizes that OSV travel is a legitimate use of the national forests. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses.” A reasonable alternative must address the purpose and need for action. An alternative that prohibits OSV use on all of the Lassen National Forest would be an action alternative because an action would be required to prohibit OSV use on the Lassen National Forest. However, a “no OSV use” action alternative would not address the purpose and need for action, and was therefore not considered reasonable.
121	5	Recreation	The range of alternative actions described in the DEIS is unreasonably narrow Alternative One - which reflects existing management status - is not an actionable option. Rather, it demonstrates why the review of OSV management as directed in TMR subpart C is both timely and important. For instance, the analysis for Alternative One discloses that existing OSV management is out of compliance with LNF's Land and Resource Management Plan (LRMP). The plainest of several examples of this is that the Blacks Mountain Research Natural Area still has not to date been properly protected from OSV entry as is required in LNF's LRMP. Thank you for your comment. The Blacks Mountain RNA would not be designated for OSV use under any alternative being considered in depth.

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80	25	Recreation	The DEIS does not consider a full range of alternatives. Regardless of whether it is referred to as a "no action" or "baseline" or "nonmotorized emphasis" alternative, the EIS should include an alternative under which no areas or routes would be designated as open to recreational OSV use, or at least an alternative that considers a scenario where OSV use is restricted comparable to current restrictions on wheeled vehicle use.16 This alternative is necessary to provide an accurate comparison for analysis of the impacts associated with all of the area and route designations made in this winter travel plan-including those allowing continued OSV travel on existing routes. Unlike in a typical NEPA analysis where the no action alternative provides the baseline for comparison, the no action alternative for most winter travel planning efforts reflects a current management status quo that is contrary to the Forest Service regulations requiring a closed unless designated open regime. The FEIS considers a reasonable range of alternatives. The “no action” alternative takes no action, and would allow existing OSV management to continue. The agency recognizes that OSV travel is a legitimate use of the national forests. The purpose and need is to effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses. A reasonable alternative must address the purpose and need for action. An alternative that prohibits OSV use on all of the Lassen National Forest would be an action alternative because an action would be required to prohibit OSV use on the Lassen National Forest. However, this action alternative would not address the purpose and need for action and was therefore not considered reasonable. Under the minimization criteria, we have already identified areas of concern and restricted OSV use in those areas. In preparing the FEIS, we determined that there are additional areas below 3,500 feet on the Lassen National Forest than what we determined in the DEIS. Therefore, in alternative 3, these additional areas will not be designated for OSV use. Based on the issues identified, and purpose and need for action, alternatives 1 through 4 represent a reasonable range of alternatives for the decision maker to consider.
143	2	Recreation	The DEIS assumes that "Global climate change is expected to substantially affect California over the next 50 years." We understand that the DEIS prohibits OSV use in any area below 3,500 feet in elevation on the Lassen National Forest to ensure adequate amount of snowfall for OSV use. We support this measure and recommend that the FEIS include a clear provision to adjust this elevation prohibition, as needed, to accommodate the possibility that climate change will alter the minimum elevation at which snowfall occurs, in order to ensure that OSV activities are directed to areas with sufficient snow cover for responsible use into the foreseeable future. Thank you for your comment.

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125	13	Recreation	Snowmobile technology has outpaced the Forest Service's ability to analyze current technologies. New snowmobile design improvements have resulted in lower weight machines with reduced pounds per square inch on the snow surface, and a reduced bulkhead angle. Wider plastic skis and longer tracks "float" a snowmobile, resulting in less compaction to the snow. Emissions and noise levels are lower. These significantly lower impacts from modern snowmobiles were not considered in the DEIS. The OSV area and trail designations apply to public use of all OSV's that meet the definition of an OSV, whether newer or older technology. If monitoring determines that the designations made in this analysis would need to be modified in the future, appropriate changes to the designations would be made.
125	22	Recreation	SAC 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. Please respond, because it is important for us to know why the Forest Service ignored this publication. Although this publication was not cited directly, the DEIS 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. This publication has been provided to the resource specialists for review and use in the FEIS analysis, as appropriate.
80	75	Recreation	We appreciate that the LNF included a noise analysis in the DEIS; however, this noise analysis does not provide much useful information. It has not been used to distinguish the various alternatives, nor has it been used to illustrate how boundary lines between open and closed areas can be drawn so as to minimize noise impacts. The techniques used in the noise analysis should be applied to determine which alternative provides the most separation of nonmotorized trails and areas from the noise impact of OSVs. The FEIS examines effects of the proposed action and alternatives on ambient noise levels. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. DEIS p 394: Ongoing monitoring for user conflicts would consider the influence of noise on recreational experiences. Site specific sound modeling with the SPreAD-GIS program may be useful to analyze individual areas if future conflicts are identified through monitoring.

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80	19	Recreation	the DEIS fails to consider how current management - much of which would be carried forward in Alternatives 1, 2 and 4 - has led to conflict between uses. Existing and potential conflict between motorized and non-motorized uses is discussed throughout the analysis. DEIS p. 9 describes conflicts; DEIS Table 17 compares conflict across alternatives; DEIS p. 131 discusses types of conflicts; DEIS p. 135 discloses that conflicts on the Lassen are currently minor and infrequent; p. 137 no known conflicts between classes of vehicles; p.149 comparison of conflict for all alternatives.
121	16	Recreation	LNF's proposed OSV area designation does not comply with TMR subpart C USFS' TMR directs snow-country national forests to identify areas of each forest - discrete areas, each smaller than a ranger district - which prove suitable for OSV recreation.2 This process requires consideration of all standing restrictions as well as an evaluation of all varieties of OSV impacts and a determination of areas where these vehicular recreation impacts can be minimized and made tolerable. The TMR definition of “area” was applied to the modified proposed action and analyzed in the DEIS (DEIS p 34). We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
121	17	Recreation	This failure to actually evaluate the suitability of, and to designate, particular (discrete) reaches of the forest for OSV use is a recipe for trouble. For instance, the Pacific Crest National Scenic Trail (PCT) is, by public law and USFS policy, unavailable for OSV use. Regardless of this status, LNF proposes to designate a vast area for OSV off-trail cross- country use which indiscriminately overruns and subsumes the alignment of the PCT. Any OSVUM drawn to that effect would be contradictory and would render the task of enforcement along the dedicated pedestrian route a legal impossibility. LNF's proposal thus contravenes the very purpose of OSV area designation under TMR subpart C. The proposed action, alternative 2 of the FEIS, has been modified to establish a corridor for the Pacific Crest Trail, within which public OSV use would not be designated (public OSV use would be prohibited), except on 26 designated public OSV trails across this corridor. In alternatives 1, 3, and 4, OSV would be allowed adjacent to and across the PCT. Motorized use would be prohibited on the tread of the PCT.
137	7	Recreation	Managing discrete winter motorized areas that are delineated by roads, ridges, and rivers would concentrate OSV impacts, minimize impacts on natural resources and stop the displacement of non-motorized winter recreationists. The TMR definition of “area” was applied to the modified proposed action and analyzed in the DEIS (DEIS p 34). We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The FEIS considers impacts to natural resources and non-motorized winter recreation.
121	15	Recreation	With respect to the 'OSV area' definition provided in the TMR, a discrete 'area' designated for OSV use on LNF could be situated, for instance, on the Almanor Ranger District and be delimited along one side (at a respectful distance) by the alignment of the PCT. A separate OSV area might be designated on the other side of the PCT (again at a respectful distance). The proposed action, alternative 2 of the FEIS, has been modified to establish a corridor for the Pacific Crest Trail, within which public OSV use would not be designated (public OSV use would be prohibited), except on 26 designated public OSV trails across this corridor.

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83	1	Recreation	the Forest Service's statement of purpose and need confuses the agency's "closed unless designated open" travel management policy with an outdated "open unless designated closed" approach. By regulation, for each national forest unit with adequate snowfall, the Forest Service must designate and display on a map areas and routes where OSV use is permitted. 36 C.F.R. Â§Â§ 212.80(a), 212.81(a). OSV use outside of the designated system is prohibited. Id. Â§ 261.14. Therefore, forests are supposed to apply a "closed unless designated open" approach to OSV designations. See, e.g., 80 Fed. Reg. 4500, 4507 (Jan. 28, 2015) (concluding that "it would be clearer for the public and would enhance consistency in travel management planning and decision-making if the Responsible Official were required to designate a system of routes and areas where OSV use is prohibited unless allowed" (i.e., marked open on a map)). This paradigm shift in the agency's travel management approach means there must be significant changes in how OSVs are managed on National Forest lands. The Forest Service's statement of purpose and need should reflect those changes. The approach to be applied in the management of OSV use on the Lassen National Forest would be “closed unless designated.” The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The analysis in the FEIS shows closed areas for context purposes. The “closed unless designated” approach would be used at implementation. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14.
83	4	Recreation	Forest system lands where "OSV Use [is] Allowed Unless Prohibited"); id. at 6 (proposing to prohibit OSV use on 29,130 acres of land below 3,500 feet and to prohibit OSV use in the Black Mountain Research Natural Area, and noting that "no existing orders or directives that have formally prohibited OSV use within" these areas). Consistent with a "closed unless designated open" approach, the Forest Service should re-characterize its proposed actions as designating OSV trails and areas as "open." All other parts of the forest are, by default under the agency's own rules, closed to OSV use. The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14.

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80	4	Recreation	The OSV Rule requires each National Forest unit with adequate snowfall to designate and display on an OSV use map a system of areas and routes where OSVs are permitted to travel; OSV use outside the designated system is prohibited.2 Thus, rather than allowing OSV use largely by default wherever that use is not specifically prohibited, the rule changes the paradigm to a "closed unless designated open" management regime. This paradigm shift entails significant changes in how snowmobiles are managed on National Forest lands. Forests must apply and implement the minimization criteria when designating each area and trail where OSV use is permitted,3 not as a means of justifying existing management. Any areas where cross-country OSV use is permitted must be "discrete, specifically delineated space[s] that [are] smaller . . . than a Ranger District" and located to minimize resource damage and conflicts with other recreational uses.4 The minimization criteria must come first, followed by drawing lines on the map. The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14. The TMR definition of “area” was applied to the modified proposed action and analyzed in the DEIS (DEIS p 34). We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
10	2	Recreation	The OSV Rule requires the Forest Service to designate specific areas and trails where OSVs are allowed and prohibits OSV use outside of this designated system. The Lassen's approach to defining OSV open areas as "any part of the Lassen National Forest where OSVs are not otherwise prohibited" (DEIS page 18) is in direct contrast to what the OSV Rule requires. The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14.
80	11	Recreation	Under the OSV Rule, the LNF is also required to designate discrete areas as open to OSV cross-country travel. These areas must be smaller than a ranger district, and areas that are not specifically designated as open are closed to OSV use. However, the DEIS states that designated OSV areas on the LNF will be "located in any part of the Lassen National Forest where OSVs are not otherwise prohibited."7 Not only is this approach in direct contrast to the "closed unless designated open" framework set forth by the OSV Rule, it does not lead to area designations that are "discrete," "specifically delineated," and "smaller . . . than a ranger district."8 Rather than identify and delineate discrete open areas, the LNF has proposed to designate over 80% of the forest as open to OSVs.9 The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14. The TMR definition of “area” was applied to the modified proposed action and analyzed in the DEIS (DEIS p 34).

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86	2	Recreation	The OSV Rule requires the Forest Service to designate specific areas and trails where OSVs are allowed and prohibits OSV use outside of this designated system. However, the Lassen's approach to defining OSV open areas as "any part of the Lassen National Forest where OSVs are not otherwise prohibited" (DEIS page 18) is in direct contrast to what the OSV Rule requires. The final EIS and Preferred Alternative should address this discrepancy. The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14.
132	2	Recreation	The OSV Rule requires the Forest Service to designate specific areas and trails where OSVs are allowed and prohibits OSV use outside of this designated system. However, the Lassen's approach to defining OSV open areas as "any part of the Lassen National Forest where OSVs are not otherwise prohibited" (DEIS page 18) is in direct contrast to what the OSV Rule requires. The final EIS and Preferred Alternative should address this discrepancy. The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14.
136	1	Recreation	the DEIS does not abide by the 2015 OSV Planning Rule to manage the forest as closed to OSV use unless marked as open; The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14.
136	4	Recreation	The Lassen National Forest does not meet the intent of the Forest Service Travel Management Regulations as the approach taken on the Lassen is to manage the entire forest as open to OSV use unless marked closed. Under the 2005 Travel Management Rule, Off Highway Vehicle routes and areas on public lands are managed as "closed unless designated open." Likewise, the 2015 Over-Snow Vehicle Rule requires the Forest Service to manage its lands as closed to OSV use unless marked open. This requirement necessitates that the Forest Service identify discrete areas where OSV use is allowed but the Lassen National Forest has failed to identify such areas thus far. The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14. The TMR definition of “area” was applied to the modified proposed action and analyzed in the DEIS (DEIS p 34).
136	7	Recreation	Friends of Plumas Wilderness urges the Forest Service to follow the 2015 OSV Planning Rule and manage the Lassen National Forest as "closed unless designated open" by delineating discrete areas open to OSV use that use roads, ridges and rivers as boundaries. The TMR definition of “area” was applied to the modified proposed action and analyzed in the DEIS (DEIS p 34). We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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137	2	Recreation	I urge that the Forest Service address OSVs like Off-Highway Vehicles and manage the forest under the "closed unless designated open" framework. Under the 2005 Travel Management Rule, Off Highway Vehicle routes and areas on public lands are managed as "closed unless designated open." Likewise, the 2015 Over-Snow Vehicle Rule requires the Forest Service to manage its lands as closed to OSV use unless marked open. The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14
148	76	Recreation	The DEIS alternatives propose to designate vast open areas "located in any part of the Lassen National Forest where OSVs are not otherwise prohibited."51 This approach is improper. It rubber stamps the status quo by leaving the vast majority of the forest - between 76 and 85% - open to cross-country OSV use essentially by default. The DEIS alternatives would, as a practical matter, maintain an "open unless designated closed" approach. The final OSV rule specifically rejects this approach, and instead requires the agency to "designate" specific areas and routes and prohibits OSV use outside of the designated system.52 In other words, the rule requires forests to make OSV designations under a consistent "closed unless designated open" approach and not to designate areas as open essentially by default.53 The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14.
148	83	Recreation	The Lassen National Forest must abandon its approach of designating as open any areas "where OSVs are not otherwise prohibited." Instead, the Forest Service must look closely at the entire forest and designate as open only those discrete, specifically delineated areas that are appropriate for cross-country OSV use based on application of the minimization criteria. All other areas that are not determined to be appropriate for open designation must then be closed, moving the forest into the required "closed unless designated open" management regime. The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14. The TMR definition of “area” was applied to the modified proposed action and analyzed in the DEIS (DEIS p 34). We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
152	1	Recreation	As written in my scoping comments, our understanding is the LNF has a substantive duty under the Motorized vehicle rule (36 CFR 212.55) to designate OSV areas as closed unless designated open. Unfortunately, despite the clear rule, all alternatives proposed have "OSVs allowed unless otherwise prohibited" (Pg. 18 DEIS) designation. The proposed action is to designate areas and trails where OSV use is allowed and to identify OSV trails for grooming. The trails and areas designated for public OSV use would be displayed on the over-snow vehicle use map (OSVUM). Public OSV use that is inconsistent with the OSVUM would be prohibited under federal regulations at 36 CFR §261.14.

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102	1	Recreation	I read about the restrictions that you are wanting to change. How would I be able to know what elevation I am riding at. Most of the time, I am riding the groomed trails, but it's nice to be able to ride up a hill. With your restrictions, I will not know. How do you or myself enforce this??? Alternative 4 addresses this concern.
125	18	Recreation	The FS cannot predict weather and snow conditions solely on elevation. When there is a storm that produces low elevation snow, OSVs should be allowed to access the forest from the valley. Setting a minimum elevation for OSVs is arbitrary and capricious, and is not supported by science. SAC urges the LNF to remove this restriction from their decision. Please respond to this issue. Alternative 4 addresses this concern.
125	19	Recreation	This restriction must not be included as part of the decision. If there is adequate snow below 3500 ft. elevation, the public must be allowed to use the area to access the rest of the forest in the same manner as higher elevations. It is irrelevant how often there is snow at that elevation. People often like the lower elevation areas because they are not usually able to ride there and enjoy new scenery. Using low elevation areas will also allow the public to reach unloading/staging areas with much less driving time and gas Alternative 4 addresses this concern.
150	1	Recreation	I do not support a 3500' min. elevation restriction as it would be difficult to enforce. Thank you for your comment. Alternative 4 addresses this concern.
105	3	Recreation	Item No . 3: To prohibit public OSV use on 29,130 acres of National Forest System land below 3,500 feet in elevation on the Lassen National Forest. Comment I Concern - The 3,500 feet elevation restriction is simply too arbitrary I restrictive and would be difficult for the public to adhere to and the LNF to enforce. During non-drought years, there are many areas within the LNF that receive adequate snow cover to support OSV use on a short term basis below this elevation. In addition, without clearly marking the 3,500 elevation level throughout the LNF it would be impractical for an OSV user or USFS representative to determine if they are at or below the 3,500 elevation threshold . Recommendation : Remove the elevation restriction and allow the OSV operator to decide whether he or she can safely travel on minimal snow coverage to access the backcountry where deeper snow exists. Alternative 4 addresses this concern.
102	4	Recreation	You should check the actual mileage being groomed at Lassen. The FEIS reflects an accurate estimate of trail miles under NFS jurisdiction and trail miles to be groomed.
144	3	Recreation	I think it would be very important for you to get with the groomers and verify the actual mileage being groomed. The FEIS reflects an accurate estimate of trail miles under NFS jurisdiction and trail miles to be groomed.
150	4	Recreation	recommend Lassen verify actual mileage being groomed. The FEIS reflects an accurate estimate of trail miles under NFS jurisdiction and trail miles to be groomed.
155	2	Recreation	I recommend Lassen verify actual mileage being groomed. The FEIS reflects an accurate estimate of trail miles under NFS jurisdiction and trail miles to be groomed.

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80	59	Recreation	The proposed winter travel management plan contains inadequate provisions for monitoring for the effects of displacement of nonmotorized users.33 The DEIS contains occasional references to monitoring of trailheads and groomed trail areas for user conflicts,34 but this requirement must be incorporated into the more formal lists of monitoring actions.35 We do appreciate that the monitoring plan includes monitoring of whether "OSV use restricted to designated routes is not encroaching outside the trail corridor" - this will be important if the preferred alternative includes areas where OSV travel is restricted to designated routes. The FEIS discloses the potential impacts of OSV use on non-motorized recreation opportunities. A monitoring plan will be developed after this decision is issued. If monitoring discovers a need for changes to the selected alternative, those changes will be implemented.
80	60	Recreation	Formal monitoring actions should also include monitoring of recreation trends that impact recreation conflicts, including monitoring of the demand for nonmotorized and motorized recreation opportunity, and monitoring the relative extent of OSV impacts to nonmotorized users, through such trends as changes in use levels, changes in types of machines (such as developments of new forms of OSVs which may have different or new impacts),36 and changes in use patterns. The FEIS discloses the potential impacts of OSV use on non-motorized recreation opportunities. A monitoring plan will be developed after this decision is issued. If monitoring discovers a need for changes to the selected alternative, those changes will be implemented.
83	80	Recreation	To the extent the Forest Service attempts to mitigate impacts or conflicts by relying on monitoring, it must provide for details for its monitoring plan. CEQ's NEPA regulations indicate that "a monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation" in the Record of Decision. 40 C.F.R. Â§ 1505.2(c). The rules go on: "agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases, and upon request make available to the public the results of relevant monitoring." Id. Â§ 1505.3. The Forest Service should provide the results of any monitoring of conflicts on the Lassen National Forest. The FEIS discloses the potential impacts of OSV use on non-motorized recreation opportunities. A monitoring plan will be developed after this decision is issued. If monitoring discovers a need for changes to the selected alternative, those changes will be implemented.
136	17	Recreation	Friends of Plumas Wilderness suggests establishing Limits of Acceptable Change (LAC) for all monitoring efforts. The LAC system is a framework for establishing acceptable and appropriate resource and social conditions in recreation settings. LAC can be applied to monitoring indicators identified in the Lassen DEIS (resources - white bark pine on Burney Mountain, sensitive species in botanical Special Areas, etc. and social conditions - presence of OSV use in prohibited area and OSV use off designated routes). Standards are used to realize desired conditions when monitoring triggers management actions. For example, if the standard is "no OSV trespass in Wilderness", evidence of one incident of OSV trespass would trigger a management action (increased education) while the second trespass would trigger another (temporary closure of the route where the violation occurred) and a third trespass would trigger yet another management action (winter closure of the route where the violation occurred). The FEIS discloses the potential impacts of OSV use on non-motorized recreation opportunities. A monitoring plan will be developed after this decision is issued. If monitoring discovers a need for changes to the selected alternative, those changes will be implemented.

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136	21	Recreation	Friends of Plumas Wilderness urges that wording be included in the Lassen OSV EIS that states if monitoring indicates motorized trespass into a Wilderness Area occurs, management actions will be taken to protect LAC standards. For example, after monitoring indicates one trespass event, a warning will be posted; after two trespass events, the route from which the trespass occurred will be temporarily closed; after three trespass events, the route will be closed for the winter season. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. Trespass of OSVs into non-motorized areas would not be authorized by this action. Any use of OSVs that would be inconsistent with the designations to be made by this decision would be illegal.
136	23	Recreation	Friends of Plumas wilderness urges that wording be included in the Lassen OSV EIS that states if monitoring indicates motorized trespass into a Wilderness Area occurs, management actions will be taken to protect LAC standards. For example, after monitoring indicates one trespass event, a warning will be posted; after two trespass events, the route from which the trespass occurred will be temporarily closed; after three trespass events, the route will be closed for the winter season. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. Trespass of OSVs into non-motorized areas would not be authorized by this action. Any use of OSVs that would be inconsistent with the designations to be made by this decision would be illegal.
83	55	Recreation	the reason there are no standards to identify or enforce prohibitions against unacceptable noise or air quality levels from OSV use on the Lassen National Forest is because the agency has yet to set any standards. One option before the agency is to prohibit "unacceptable" noise or air quality impacts from OSV use. This is a workable standard that the agency has the authority, and duty, to establish and enforce. The imposition of best available technology requirements is outside the scope of the purpose and need for action, The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The regulation of best available technology, whether only encouraged or mandated, is outside the scope of this analysis. The Forest Service has no regulatory jurisdiction over air quality or noise and there are no Forest Service directives requiring the establishment of standards. Therefore this feature will not be included in alternative 3 to be analyzed in detail.
67	2	Recreation	I would like to see buffers of at least 1/4 mile (or more - whatever can be feasibly enforced) around LVNP, all Wilderness and proposed Wilderness Areas on the Forest, and the PCT. Keeping OSV's back from these areas will help prevent illegal encroachment which is currently happening in places or is tempting. The FEIS discloses the potential indirect effects of the alternatives on non-motorized areas.

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124	3	Recreation	In reviewing your project map for the proposed area, I see very few areas outside of Lassen National Park where there are non-motorized ski trails. Those that do exist, like those in the McGowan and Lake Almanor areas, are surrounded by areas where OSV use is permitted off of designated routes. This leaves very little area where one can back-country ski and not encounter noisy, smelly, machines. Please consider creating more opportunities for quiet non-motorized users like myself to enjoy the piece of the forest in its natural state. Alternatives 2 (modified) and 3 address this concern.
83	58	Recreation	We urge the Forest Service to restrict OSV use in areas surrounding and adjacent to Wilderness and proposed Wilderness because the increase in capability and popularity of motorized vehicles will put increased pressure on proposed Wilderness unless those uses are restricted. Furthermore, the continuing or expanding use of vehicles will do nothing but reduce the chances of these neighboring areas being designated as Wilderness. The FEIS discloses the potential indirect effects of the alternatives on non-motorized areas.
136	24	Recreation	Friends of Plumas Wilderness strongly supports designation of the Heart Lake Wilderness. To minimize motorized intrusion into the Congressionally designated Heart Lake National Recreation Trail and the administratively designated Heart Lake Recommended Wilderness, Friends of Plumas Wilderness recommends closing the un-groomed OSV trail on Primary Forest Route 17. No plowed parking area is provided at either end of this un-groomed OSV route. This action would not affect any groomed OSV trails. The agency cannot designate Wilderness. However, this concern is addressed in all alternatives. The FEIS discloses the potential indirect effects of the alternatives on non-motorized areas.
136	25	Recreation	Friends of Plumas Wilderness strongly supports designation of the Mill Creek Wilderness. Although there is less likelihood of OSV intrusion into this area than higher elevation areas, we suggest posting signs at logical locations indicating the area is managed as Wilderness and no motorized or mechanized use is allowed. The agency cannot designate Wilderness. However, this concern is addressed in all alternatives. The FEIS discloses the potential indirect effects of the alternatives on non-motorized areas.
136	26	Recreation	Friends of Plumas Wilderness strongly supports designation of the Wild Cattle Mountain Wilderness. To minimize motorized intrusion into the Congressionally designated Spencer Meadows National Recreation Trail and the administratively designated Wild Cattle Mountain Recommended Wilderness, Friends of Plumas Wilderness recommends posting signs at logical locations indicating the area is managed as Wilderness and no motorized or mechanized use is allowed. The agency cannot designate Wilderness. However, this concern is addressed in all alternatives. The FEIS discloses the potential indirect effects of the alternatives on non-motorized areas.

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83	56	Recreation	The Forest Service fails to explain how proposed OSV trail designations near or bordering Lassen National Park, designated Wilderness, proposed Wilderness, or other non-motorized designated areas will impact the use of these areas. It also lacks an explanation for how those OSV trails and areas were designated to minimize impact to these areas. For example, the Caribou Wilderness, Thousand Lakes Wilderness, and Heart Lake Recommended Wilderness are, and should remain, closed to OSV use. Proposed Wilderness is a natural resource that the Forest Service must protect when designating OSV use. The Forest Service must manage proposed Wilderness to preserve and protect its suitability for wilderness designation. Accordingly, the agency may not permit "any use or activity that may reduce the wilderness potential of the area." The FEIS discloses the potential indirect effects of the alternatives on non-motorized areas.
83	70	Recreation	Forest Service Manual 1923.03. See also 36 C.F.R. Â§ 219.10(b)(1) (2012) (LMPs must include standards and guidelines that provide for "management of areas recommended for wilderness designation to protect and maintain the ecological and social characteristics that provide the basis for their suitability for wilderness designation."). Management decisions that allow motorized use in or along the borders of recommended wilderness can result in damage to the wilderness potential of these areas. The Forest Service must consider not designating trails or areas for OSV use in or along the borders of Wilderness or proposed Wilderness. Current Forest Service Manual direction requires that the Forest Service manage recommended wilderness so as not to reduce wilderness potential or compromise wilderness values. Specifically, the direction states: Any inventoried roadless area recommended for wilderness or designated wilderness study is not available for any use or activity that may reduce the wilderness potential of the area. Activities currently permitted may continue pending designation, if the activities do not compromise the wilderness values of the area." These proposed wilderness areas are not designated for OSV use under any alternative. The FEIS discloses the potential indirect effects of the alternatives on these areas.
137	8	Recreation	The Lassen OSV Draft Environmental Impact Statement repeatedly states that most OSV use on the Lassen National Forest occurs on groomed OSV routes and that little-to-no use of OSVs occurs more than one and one half miles from an OSV trail. Why allow unrestricted OSV access to 82% of the Forest when this is the case? We have not identified issues driven by user conflicts or resource concerns that would require that we further restrict OSV use or develop additional alternatives than are already being analyzed in depth.
125	25	Recreation	Based on current and projected use, the DEIS does not show a need to provide 68,430 additional quiet areas proposed in Alternative 3. Management for exclusive non-motorized uses within the Lassen NF currently provides for: * 3 wilderness areas (78,060 acres), * 3 proposed wilderness areas (61,686 acres), * Lassen Volcanic National Park (106,372 acres), * 6 Research Natural Area * 84 miles of Wild and Scenic River * 125 miles of Pacific Crest Trail This is a total of 246,118 acres within the Lassen NF that is currently managed for non-motorized use, which doesn't include the PCT, RNA or the Wild and Scenic River acreage. There appears to be a pattern in the five forests' proposed actions which would add non-motorized areas directly adjacent to wilderness and RARE-2 areas, effectively creating de facto wilderness. We do not support these actions under an OSV project. It is more appropriate to do a separate EIS for such proposals, to properly engage the public in meaningful discussion, to study all the cumulative effects-not only OSV. Alternative 3 would be one way to address the purpose and need for action. Therefore, it is being considered in depth.

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80	66	Recreation	The multiple references in the DEIS to "approximately 148 miles of National Forest System trail closed to OSV use"38 is misleading. 10639 of these miles are the Pacific Crest National Scenic Trail (PCT). While the PCT is an important non-motorized trail and the Forest Service is legally obligated to manage it to protect its non-motorized nature, it has never been considered by the LNF as a winter recreation resource. The PCT is not groomed, marked for winter use, or particularly easy to follow in winter. Presumably for the above reasons, the PCT is not shown on the LNF's current Winter Recreation Guide.40 Alternative 2 addresses this concern.
139	13	Recreation	Page 118 (e-page 144) of the DEIS defines the Recreation Opportunity Spectrum (ROS) of Semi-Primitive Motorized as, "This prescription is derived from the Recreation Opportunity Spectrum (ROS) class of semi-Primitive Motorized (SPM) (see Appendix J for the definition of this class). It is intended to facilitate dispersed, motorized recreation, such as snowmobiling, four-wheel driving, and motorcycling, in areas essentially undisturbed except for the presence of four-wheel drive roads and trails. Non-motorized activities such as hiking, fishing, hunting, picnicking, and cross-country skiing are also possible. Motorized travel may be seasonally prohibited or restricted to designated routes to protect other resources. (LRMP 4-60)." It even seems clear from this language that motorized, and specifically OSV, use should be limited to designated routes, not entire large areas across most of the Forest. Opening OSV use will displace and discourage quite recreationists from using the PCT and nearby Forest lands. The semi-primitive motorized ROS classification allows dispersed motorized recreation, which is why we are not restricting OSV use to trails only. We have not identified issues driven by user conflicts or resource concerns that would require that we further restrict OSV use or develop additional alternatives than are already being analyzed in depth.
121	12	Recreation	Areas designated for off-trail cross-country OSV use should not overreach (overlap) any protected area or non-motorized terrain such as the PCT alignment. This concern is addressed in alternative 2.
139	2	Recreation	Although PCTA supports the above design features, we are disappointed that the Proposed Action does not propose to prohibit snowmobile riding in the area adjacent to and along the PCT. To our surprise, none of the alternatives propose the areas along or adjacent to the PCT to be closed to motorized use. Page 133 (e-page157) of the DEIS states, "Most of the PCT on the Lassen National Forest passes through areas that are either closed to OSV use, or within areas where low to no OSV use is expected." We are confused by this statement; based on our understanding of the project maps and DEIS, it seems that most of the areas the PCT travel through will allow snowmobile use. This concern is addressed in alternative 2.

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139	3	Recreation	In PCTA's comment letter in January 2015 in response to the Lassen NF OSV Use Proposed Action document, we suggested the Forest create a non-motorized corridor along the trail to protect the trail experience for skiers and snowshoers. The Lassen NF's response in the DEIS' states, "We acknowledge the importance of appropriate management of the PCT. However, the creation of a non-motorized corridor along the PCT would not be within the scope of this project which is to provide a manageable, designated OSV system of trails and Areas for public use within the Lassen National Forest, that is consistent with and achieves the purposes of the Forest Service Travel Management Rule at 36 CFR part 212, subpart C. Consideration of a non-motorized corridor along the PCT is more appropriately addressed during the Forest Plan Revision process." PCTA acknowledges this perspective; however, the Subpart C project is the means to make travel management decisions. To clarify our earlier suggestion, PCTA feels strongly that the Deciding Official should not actively allow OSV use in the areas along or adjacent to the PCT. The final Travel Management Subpart C Rule states, "The Department agrees that it would be clearer for the public and would enhance consistency in travel management planning and decision making if the Responsible Official were required to designate a system of routes and areas where OSV use is prohibited unless allowed." In short, OSV use is prohibited in areas unless the Deciding Official actively allows OSV use. This concern is addressed in alternative 2.
139	4	Recreation	PCTA believes motorized use immediately adjacent to the PCT does substantially interfere with the nature and purposes of the PCT. PCTA supports mechanized and motorized recreation on National Forest lands; however, motorized recreation adjacent to the trail is incompatible with the experience the PCT is meant to provide for hikers, horseback riders, as well as skiers and snowshoers. This concern is addressed in alternative 2.
139	5	Recreation	In the same section, the Act specifically prohibits the use of motorized vehicles along the PCT. The Act states, "The use of motorized vehicles by the general public along any national scenic trail shall be prohibited and nothing in this Act shall be construed as authorizing the use of motorized vehiclesâ€¦" It is clear from the use of the word along, that Congress did not intend for motorized use to be adjacent to PCT. This concern is addressed in alternative 2.
139	6	Recreation	The Forest Service PCT Comprehensive Plan contains even more specific language and addresses the use of snowmobiles and winter use. The Plan states, "Snowmobiling on the trail is prohibited but crossing at designated locations is consistent with the purpose of the trail." The Plan continues, "Snowmobiling along the trail is prohibited by the National Trails System Act, P.L 90-543, Section 7(c). Winter sports plans for areas through which the trail passes should consider this prohibition in determining areas appropriate for snowmobile use." The use of the word areas in the Comprehensive Plan makes it clear that the PCT is not meant to be managed in a manner that only protects the trail tread; rather, the areas around the trail must be managed in a way that does not allow other uses to substantially interfere with the Nature and Purposes of the PCT. Lastly, the Comprehensive Plan continues, "If cross-country skiing and/or snowshoeing is planned for the trail, any motorized use of adjacent land should be zoned to mitigate the noise of conflict." This last statement makes it clear that OSV use should not occur immediately adjacent to the PCT. If the lands around the trail are not "zoned" to prohibit OSV use, skiers and snowshoers will be displaced and discouraged from using the PCT in many areas on the Lassen NF. This concern is addressed in alternative 2.

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139	7	Recreation	PCTA suggests that in addition to the design features already proposed in the DEIS, the Lassen NF prohibit OSV use along the PCT similar to the protection afforded the AT. The area needs to be wide enough to protect the trail experience for PCT users. As such, PCTA strongly suggests an area based on the USFS Scenery Management System definition of Foreground. This will prohibit OSV use in an area up to one-half mile in the visible lands on each side of the PCT. In some areas the area would be less as the visible landscape along the PCT will be less than one-half mile on each side of the trail due to topography. An area this size is not only needed to protect the non-motorized user experience; it may also be needed to provide for PCT user safety as many snowshoers and skiers move up to ridge tops that are just above the PCT to reduce the hazards associated with avalanche danger while traveling on steep side hill terrain. PCTA acknowledges that it may not be feasible to prohibit OSV use in an area this wide along the entire PCT. In these areas PCTA suggests a minimum area of 500 feet on each side of the trail that prohibits OSV use along the PCT. This concern is addressed in alternative 2.
139	8	Recreation	Allowing OSV use adjacent to the PCT does not only seem to be inconsistent with the management direction in the National Trails System Act and the PCT Comprehensive Plan, but also language found in the DEIS. Page 9 (e-page 35) states, "OSV use has the potential to impact designated areas that are managed for non-motorized recreation opportunities through illegal encroachment, noise, and increased human presence (i.e., Pacific Crest Trail, Wilderness)." The DEIS uses the PCT as an example of a designated area. This language should further reinforce the need to manage the area around the PCT to be consistent with the Nature and Purposes for which the trail was designated. This concern is addressed in alternative 2.
139	9	Recreation	In the section of the DEIS that analyzes the potential impacts of the Proposed Action, the PCT is addressed in the section titled "Designated Areas." The 2012 Forest Planning Rule and Directives state that the PCT is to be managed as a Designated Area, not simply a linear facility. The Forest Service defines "Designated Areas" in the final forest plan rule in section Â§ 219.19 as, "an area or feature identified and managed to maintain its unique special character or purpose. Some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch. Examples of statutorily designated areas are national heritage areas, national recreational areas, national scenic trails, wild and scenic rivers, wilderness areas, and wilderness study areas." Although the Subpart C project is a travel management decision and not a Forest Planning effort, to allow motorized use adjacent to the PCT, is in contradiction with the most current Forest Service directives to manage the PCT as an area, not just a 36" trail tread. This concern is addressed in alternative 2.
139	11	Recreation	Along this same rationale, the noise study in the DEIS addresses noise impacts to the PCT at some specific designated crossings. The information is presented in a manner that gives the impression that these noise impacts will only affect limited areas of the PCT at the designated crossings. We feel this information is misleading, being that there could be OSV noise along nearly the entire length of the PCT if OSV use is allowed along the trail. This concern is addressed in alternative 2. The FEIS discloses the potential indirect effects of the alternatives on these areas.

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139	12	Recreation	Page 6 (e-page 32) of the DEIS in the Purpose and Need section states, "One purpose of this project is to effectively manage OSV use on the Lassen National Forest to provide access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses." Page 128 asserts "The Pacific Crest trail (PCT) runs through the center of the Lassen National Forest from north to south. The PCT is closed to motorized OSV use and provides non-motorized winter trail opportunities." If the Lassen NF wants to meet the purposes stated above and truly wants the PCT to provide high quality non-motorized winter trail opportunities, then the areas adjacent to the trail need to prohibit OSV use. This concern is addressed in alternative 2.
80	57	Recreation	We support the LNF's proposal to designate OSV crossings on the Pacific Crest Trail to be consistent with the crossings identified for summer motorized use. However, we believe the Forest Service must do more to limit OSV impacts to this nationally-significant non-motorized trail.32 Allowing OSV use up to the very edge of the Pacific Crest Trail impacts recreational use on this trail in the same manner as OSV use in close proximity to other non-motorized trails, both with regard to the limited winter use and with regard to impacts to vegetation and soils. Although such impacts may be minimal, even minimal impacts adversely impact the intended environment of the PCT. In order to minimize these impacts the Forest Service cannot allow OSV use up to the very edge of the PCT. Boundaries of OSV use areas should be drawn to avoid the Pacific Crest Trail. We suggest a Â¼ mile non-motorized buffer on either side of the trail, with adjustments to accommodate local topography. The Forest Service should work with the Pacific Crest Trail Association to determine this buffer. This concern is addressed in alternative 2.
139	10	Recreation	Without prohibiting OSV use along the PCT, designated crossings have limited impact in protecting the trail experience. The DEIS maintains, "Designated crossings of the PCT would minimize potential motorized impacts along the trail and would enhance the quiet, non-motorized experience while accommodating motorized access to OSV Areas and maintaining OSV loop riding opportunities. Using the PCT crossings as designated in Subpart B for off-highway vehicle use, and shown on the motor vehicle use maps, would limit motorized disturbance to areas of the trail that already contain summer road crossings. With the exception of the three groomed OSV trail crossings of the PCT in the Almanor Ranger District, the PCT passes through national forest system lands that are either closed to OSV use, or areas where little to no OSV use is anticipated. Limiting OSV crossings of the PCT would adequately protect quiet non-motorized opportunities along the trail while maintaining OSV access and loop trail riding opportunities. The specific designated crossing locations would be in compliance with the PCT Comprehensive Plan." PCTA agrees with this statement in part. Yes, designated crossings would limit motorized impacts on the PCT, but this is true only if the area adjacent to the trail prohibits OSV use. How will designated crossings of the PCT protect the trail and trail experience if OSV use is allowed (literally) right next to the trail? This concern is addressed in alternative 2.
156	8	Recreation	8. To designate OSV crossings on the Pacific Crest Trail to be consistent with the crossings identified for summer motorized use under the Subpart B designations. Eliminate this Action entirely from the proposed action as it will be unenforceable. This concern is addressed in alternative 2.

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83	59	Recreation	We have concerns about continuing to allow motorized recreation within roadless areas that may have potential adverse effects on roadless values, especially in recognition of trends of increasing public use of motorized vehicles that can access previously inaccessible lands and cause resource damages. It is important that our last remaining pristine areas remain unspoiled and natural in order to provide clean water and air, sanctuary for native wildlife and plant species, and opportunities for low impact human recreation. We encourage the Forest Service to include adequate restrictions on motorized uses in remaining roadless and proposed Wilderness to protect the pristine characteristics of such areas. The FEIS discloses the potential effects of the alternatives on Inventoried Roadless Areas.
9	2	Recreation	I assume (just checking) that you all are making the-powers-that-be that OSVs can (do) trigger (many) avalanches which can be (are) very dangerous to others (OSV or otherwise a great distance away from noisy OSVs). Folks need to have places to go (and tour, snowcamp, etc.) where the danger of an avalanche triggered by an OSV is not a threat. This fact should not be used to limit non-OSV to the flat lands... OSV needs their own separate area, and so do non-OSVs who want to tour, snowcamp, etc. safely. Thank you for your comment.
125	27	Recreation	The DEIS states fixed dates of Dec. 26 - March 31 to restrict wheeled traffic on groomed trails. Fixed dates are not effective, particularly with changing weather patterns. We propose that language be eliminated and replaced with "as conditions dictate" to allow more flexibility as local conditions change on individual roads. Please give us your feedback. The 12/26 – 3/31 closure was decided in a previous analysis. Wheeled vehicles are allowed on designated OSV trails until 12/26 to allow for public Christmas tree harvest.
143	3	Recreation	Page 362 of the DEIS suggests that the season for OSV use may need to be shortened to avoid impacts to soil and water quality from OSV contact with sub snow dirt. We recommend that the FEIS include a commitment to appropriate monitoring to ensure the Forest is implementing the most appropriate season of use for OSV. The FEIS discloses the potential impacts of OSV use on non-motorized recreation opportunities. A monitoring plan will be developed after this decision is issued. If monitoring discovers a need for changes to the selected alternative, those changes will be implemented.
73	4	Recreation	the Board 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. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The designation of parking areas is outside the scope of the analysis.

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129	6	Recreation	the Hillsliders 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. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The designation of parking areas is outside the scope of the analysis.
126	1	Recreation	The "Proposed Action" does not appear to provide any areas near trailheads where non-motorized travelers can enjoy the peace and beauty of the winter landscape undisturbed by the roar and fumes of vehicle engines. Given we rely on our muscles, most of us can't travel as far into the forest as those on snowmobiles, so there is a special need to reserve existing accessible areas such as those at Colby, McGowan, Almanor and Eagle Lakes, and the Bizz Johnson trail area for enjoyment by ski, snowshoe, or foot travel. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The designation of parking areas is outside the scope of the analysis.
80	73	Recreation	Throughout the DEIS, the LNF notes the number of acres in the LNF that are closed to OSVs. The LNF fails to also note that almost all this acreage is located far from winter trailheads with no practical way for nonmotorized users to access such areas. The DEIS does not describe how close (or how far) these areas are from winter trailheads, and that such distance precludes these areas from providing nonmotorized recreation opportunities. The Butte Lake closure included in Alternative 3 was specifically intended to provide nonmotorized users a route to Wilderness and other closed areas, thus allowing nonmotorized users to obtain their desired recreation experience right from the trailhead. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The designation of parking areas is outside the scope of the analysis.The FEIS analyzes the issue of accessibility of non-motorized areas.

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80	67	Recreation	In addition, all of the other winter nonmotorized recreation trails (and much of the PCT) are located in areas where OSV use is allowed and thus do not provide the nonmotorized user with a recreational experience free of the recognized noise and air quality impacts of OSVs. The Final EIS must include a fair comparison of the amount of motorized and nonmotorized experiences offered to winter recreationists. It should note that Alternative 3, in particular (as compared to the Proposed Action), offers a substantially better recreation experience to users desiring to recreate on nonmotorized trails without changing the amount of designated trails available to either user group. The FEIS compares the acreage where motorized OSV use is allowed and prohibited for each alternative. The proposed action has been modified for the FEIS to establish a corridor for the Pacific Crest Trail, within which public OSV use would not be designated (public OSV use would be prohibited), except on 26 designated public OSV trails across this corridor.
82	8	Recreation	Alternative 3 does ask for separate trailheads for OSV and non-motorized. Given the budget challenges of the USFS and the need to focus on other recreation uses I believe that developing separate non-OSV trail head facilities is not a good use of USFS funds. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The designation of parking areas is outside the scope of the analysis.
83	73	Recreation	The Forest Service rejects the suggestion to segregate motorized and non-motorized user groups by designating separate trailheads, trails, or areas, explaining that "the development of new facilities such as new trailheads, new trails, or new snowplay areas are outside the scope of this project." DEIS at 40. The Forest Service assumes the suggestion to separate motorized and non-motorized uses would require designation of new trails or areas. But that assumption is false. In fact, as explained in section one of these comments, the Forest Service fails to consider an alternative that would close some of the previously designated OSV trails. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The designation of parking areas is outside the scope of the analysis.
148	26	Recreation	the Forest Service should consider whether to designate areas or trails by "class of vehicle" and/or "time of year," as provided for in the OSV rule.17 That provision allows forests to tailor their designation decisions to account for snowfall patterns and different and evolving OSV technologies, and to minimize corresponding social and environmental impacts. The Forest Service has found no reason to designate trails and areas by class of vehicle at this time. The OSV area and trail designations apply to public use of all OSVs that meet the definition of an OSV, whether on a single ski, double ski, or track.

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83	77	Recreation	Effective winter travel management planning and compliance with the minimization criteria require the Forest Service to account for existing and potential future over-snow recreational uses that may not satisfy the definition of OSV. See Exec. Order No. 11644 Â§ 3(a)(3) ("Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring lands . . . .") (emphasis added). For example, fat-tire bike riding is an increasing wintertime mechanized use nationally. Other new types of motorized or mechanized over-snow uses may also exist or be developed over the life of the winter travel plan. The Forest Service should also acknowledge that improvements in snowmobile technology may allow OSV use in regions that currently present physical constraints such as steep rocky cliffs. If monitoring determines that the designations made in this analysis would need to be modified in the future, appropriate changes to the designations would be made.
121	26	Recreation	LNF may not continue to ignore the consequences of these burgeoning trends in the practice of unbound OSV recreation across our consequential western reach of shared wildlands. The effect of SSOSVs' narrow, in-line configuration is most evident in uncompacted (loose, unconsolidated) snow: SSOSV skid and drive surfaces typically cut a singular rut which is often significantly deeper (variable, by my visual estimate 15% to 30% deeper) than any of the three ruts typically left in the wake of a conventional snowmobile in 'uncompacted' snow. SSOSVs' narrow width enables them to operate in tighter spaces than snowmobiles, thereby subjecting an additional variety of forest spaces to vehicular impacts. The potential of SSOSVs to impact subnivean habitat and other forest resources should be evaluated, and measures adopted to assure that they are minimized. Unfortunately, LNF's DEIS fails even to mention the existence of SSOSVs. Failure to analyze and account for changes in OSVs, their increasing variety, and burgeoning habits of OSV use. This is another issue which I outlined in my scoping comment on this project. It appears to have received no consideration in the DEIS, so I'll offer here some more detail on this concern. Snowmobiles are typical OSVs: they employ steering skids which lie outboard of the centerline track (studded traction belt) which propels the vehicle via contact with snow or other surface features. Snow motorcycles are a different type of OSV which enter increasingly on the forest. Since these vehicles (e.g. 'Timbersled') employ a single front (steering) skid mounted ahead of and in line with an extended rear drive track, they meet the USFS definition of 'Over Snow Vehicle' and thus are entitled to operate on LNF under the impending action. I will refer to these snow specialty vehicles as Single- Skid OSVs (SSOSVs). Thank you for your comments. The proposal and alternatives are designed to implement Forest-wide snow depth requirements for public OSV use that would provide for public safety and natural and cultural resource protection. While we recognize the various types of over-snow vehicles available, we feel this analysis of each alternative is appropriate. The OSV area and trail designations apply to public use of all OSV's that meet the definition of an OSV, whether on a single ski, double ski, or track. Subnivean habitat and forest resources were evaluated for each alternative in the FEIS. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
156	4	RNA	4. To prohibit public OSV use in the 520-acre Black Mountain Research Natural Area. Please check for private property ownership in this area and how this will affect them. Private timber companies own and manage timberlands in this area and this might hinder their ability to do so. If there is no concern with this, then we have no problem closing this area. None of the alternatives would prohibit OSV use on land that is not under NFS jurisdiction. The decision would not affect existing rights of access.

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125	16	Snow Depth	For cross country: Snow depth must be adequate to prevent damage to underlying resources. Snow conditions encountered by OSVs and skiers are extremely variable. The depth of snow needed to protect resources can range from 3' of snow with a solid base, to 2" of compacted snow/ice known as Sierra Concrete. OSVs must avoid locations where damage to vegetation or soils could occur, which is already restricted by existing law (CVC 38319). Environmentally sensitive areas could be closed to snowmobiling if resource damage caused or exacerbated by snowmobile activity is found to be occurring in specific areas. Each alternative being considered includes a design feature intended to prevent damage to resources. In addition, monitoring that will occur during implementation of any alternative includes effectiveness monitoring, based on available resources. Monitoring will ensure that: 1. Resource damage is not occurring when there is less than the prescribed minimum snow depth (depending on alternative) with certain exceptions as described in the alternative descriptions above. Snow depths measurement locations and techniques would be developed using an interdisciplinary team approach and would consider terrain, season, proximity to sensitive areas, and resource damage criteria. 2. Where resource damage is suspected due to public OSV use in less than the prescribed minimum snow depth, monitoring would occur to help inform the line officer if damage is occurring, the extent of the damage, and what steps need to be taken to address the issue. 3. Public OSV use is not damaging sensitive resource locations, in consultation with forest resource specialists. 4. Public OSV use is not occurring in prohibited areas. 5. Public OSV use restricted to designated routes is not encroaching outside the trail corridor.
125	3	Snow Depth	There is no science to support a minimum snow depth on ungroomed roads. It is legal to drive an OHV on ungroomed roads when snow depth allows access, which is generally 6". OSVs have less potential for impact than OHVs, pickups or log trucks, so there is illogical to restrict OSVs in the same situations where OHVs are allowed. For example, if a road has 4" of snow it would be illegal to ride a snowmobile to reach higher elevation and deeper snow. But it would be acceptable to drive a 4x4 pickup pulling a trailer with 4 snowmobiles on that same road, which may have significantly more potential to damage resources--especially considering lack of parking facilities. This concern is addressed by alternative 4.
125	2	Snow Depth	The DEIS identified three concerns that it states creates the need for snow depth restrictions. These are cultural resources, natural resources, and public safety. Inherently there are no cultural resources or botanical resources on existing road surfaces. Roads are designed and constructed to allow vehicles to contact the road surface in both wet and dry weather. So roads should have no minimum snow depth restrictions, since there are no resources affected. This concern is addressed by alternative 4.
125	12	Snow Depth	Having a minimum snow depth requirement for cross country snowmobiling is unacceptable and unnecessary. Snowmobiling cross country is self-limiting. A snowmobiler will not ride cross country if there is inadequate snow because they will quickly pay the high price of being stranded, or for repairs such as Hi Fax/track melt and engine overheating, or collision damage from shallow obstructions such as tree stumps or rocks. We challenge the analysis that 12" snow depth is necessary for public safety, because snowmobilers are well aware of the risks. If the Forest Service insists on developing safety standards, is it taking responsibility for all liability? Our research into available science on this subject has determined that 12 inches is generally sufficient to avoid damage to surface resources (vegetation and soils) in areas designated for public, cross-country OSV use.

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125	15	Snow Depth	As a solution to the problem of defining "adequate snow", SAC proposes the following wording to be included in the FEIS and ROD: For all existing roads: When snow depth prevents wheeled vehicle travel, roads will be open to OSV travel. There is no minimum snow depth requirement for travel on roads since they are constructed for vehicles to travel with contact of the road surface. This will allow OSVs to reach higher elevation areas with deeper snow. (Note: This is not likely to be abused, because expensive snowmobiles are damaged if they ride on surfaces without snow.) Snow depth for grooming shall be determined by the State OHMVR, which is currently 12". This concern is addressed by alternative 4.
129	3	Snow Depth	The Hillsliders believes that the 12" depth for groomed trails is reasonable, and allowing for 6" or even less on snow over graveled or paved roads to allow users to get from parking areas to the groomed trails and open areas is justified and should have minimal effect on the environment, as there is no vegetation on such roads. Thank you for your comment.
125	11	Snow Depth	A snow depth requirement is valid for grooming trails, because this is a requirement of the State Division of Off-Highway Vehicles grant which is intended to prevent damage to grooming equipment. This is within the State's authority for controlling grooming operations, and is not under the authority of the Forest Service. The State OHV Division has the ability to modify their minimum snow depth as equipment needs and snow conditions dictate. The Forest Service has no authority to adjust grooming specifications. We agree and our snow depth for grooming has been adjusted to be consistent with state specifications.
148	66	Snow Depth	To account for variable snowpack and ensure that OSV use occurs only where and when snowfall is adequate, minimum snow depth restrictions are a necessary tool to further minimize impacts associated with OSV area and trail designations. The best available science shows that minimum snow depths should be at least 18 inches for cross-country travel and 12 inches for travel on groomed trails.39 The Lassen's proposed minimum snow depths of 12 inches for cross-country travel, 6 inches for travel on designated trails, and 12 inches for snow trail grooming are insufficient to minimize impacts to water quality, soils, and vegetation and to buffer for variable snow conditions. While a shaded trailhead may have 6 or 12 inches of snow, south-facing slopes further up the trail may have little or no snow. Notably, the proposed 6-inch minimum snow depth on designated trails and 12-inch minimum snow depth for snow trail grooming represent reductions from current minimum snow depths of 12 and 18 inches for those activities. These reductions are particularly concerning given the current and projected impacts of climate change, which already is leading to reduced and less reliable snowpack in the Sierras.40 Indeed, the DEIS acknowledges that "climate change may increase distances winter recreation users must travel for adequate snow depth."41 The Lassen's solution to this problem appears to be to reduce the minimum snow depth on trails "to improve OSV access to areas open to OSV use."42 Rather than minimize impacts, as required, this approach is likely to increase impacts to water quality, soils, and vegetation. The DEIS itself recognizes this, by concluding that the no action alternative will have the least detrimental hydrological impacts.43 Our research into available science on this subject has determined that 12 inches is sufficient to avoid damage to surface resources (vegetation and soils) in areas designated for public, cross-country OSV use. The only places where the proposed action would allow OSV use on 6 inches of snow are where a snow trail overlays an existing road or trail. Damage to the underlying surface from operating an OSV on snow overlaying an existing road or trail would be minimal.

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148	67	Snow Depth	In addition to increasing its minimum snow depths to those supported by the best available science, the Forest Service should address its plans to enforce minimum snow depth restrictions, including protocols for monitoring snow depths, communicating conditions to the public, and implementing emergency closures when snowpack falls below the relevant thresholds. Minimum snow depths measurements should be taken at established locations that are representative of varying snow depths based on factors such as wind, orientation, slope, tree cover, etc. and depths should be reported regularly on the forest website and posted at popular access points. Ensuring consistent minimum snow depth restrictions throughout the region will help avoid enforcement difficulties. The Lassen and other forests in the northern and central Sierras undergoing winter travel planning should follow the lead of the southern Sierra Nevada forests, which are proposing a forest plan standard of 18 inches for cross-country OSV use, consistent with the best available scientific information. Our research into available science on this subject has determined that 12 inches is sufficient to avoid damage to surface resources (vegetation and soils) in areas designated for public, cross-country OSV use.
148	68	Snow Depth	To ensure adequate snowpack for OSV use to occur and to properly minimize impacts, the Lassen National Forest should: (1) close additional low-elevation areas that lack regular and consistent snowfall; (2) impose minimum snow depth restrictions of at least 18 inches for cross-country travel and 12 inches for snow trail use, consistent with the best available scientific information, and provide adequate measures for monitoring and enforcement of the restrictions; (3) clearly identify season of use restrictions; and (4) account for current and predicted climate change impacts on anticipated snowpack in making designation decisions. We have determined that an elevation of 3,500 feet is a sufficient boundary for OSV travel in the proposed action and alternative 3 because of the lack of sufficient snow below that level in most years. Our research into available science on this subject has determined that 12 inches is sufficient to avoid damage to surface resources (vegetation and soils) in areas designated for public, cross-country OSV use. The only places where the proposed action would allow OSV use on 6 inches of snow are where a snow trail overlays an existing road or trail. Damage to the underlying surface from operating an OSV on snow overlaying an existing road or trail would be minimal. Analysis has found no reason to impose season of use restrictions, because snow depth restrictions would be more flexible. Alternative 3 would impose minimum snow depth restrictions of at least 18 inches for cross-country travel and 12 inches for snow trail use.
105	7	Snow Depth	Item No.7: To implement a forest wide snow depth requirement for OSV use that would provide public safety and natural and cultural resource protection by allowing OSV use in designated areas when there is a minimum of 12 inches of snow covering the landscape; and allow OSV use on designated National Forest System snow trails when there is a minimum of 6 inches of snow covering the trail. Comment I Concern: Sno-Riders, Inc generally supports the proposed the minimum12 inches of snow depth covering the landscape on OSV designated areas and opposes the 6" minimum depth requirement on designated roads and trails. The 6" minimum depth requirement is restrictive and would prevent OSV operators to access the backcountry where deeper snow exists. Recommendation: The proposed 6" minimum depth requirement on roads and trails should be modified to say 6" of un-compacted snow and /or 1" compacted snow. This concern is addressed by alternative 4.

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125	20	Snow Depth	Snow depth is a major significant issue in this project, as emphasized by the public at the NOI meetings and in NOI comments. However, the DEIS does not list snow depth as a Significant Issue. As a result, there was no in depth scientific analysis of this issue. It is essential that snow depth is added to the list of Significant Issues and fully analyzed. Please respond to us with your plan to conduct a full and adequate analysis, so public concerns are addressed. Snow depth is a design feature that varies by alternative to address the recreational opportunity significant issue.
125	21	Snow Depth	Several references in the DEIS state "snow depth measurement locations and motoring techniques would be developed" later with an interdisciplinary team. The same is true with the Law Enforcement Plan. These two issues are the backbone of the OSV plan and must be available for proper public review before the FEIS is issued. This should not be left for the public to bring up as an "objection" later in the process. It is important to havce a supplement to the DEIS with detailed information to allow informed public comment. Without disclosing these plans, the DEIS is deficient. Please provide us with information regarding how you will provide this information to the public and allow time for comments. The purpose and need for action in these designations is to “effectively manage public OSV use on the Lassen National Forest. Effective management would provide public OSV access, ensure that OSV use occurs when there is adequate snow, promote the safety of all users, enhance public enjoyment, minimize impacts to natural and cultural resources, and minimize conflicts among the various uses” The Travel Management Regulations require that we designate “over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands (36 CFR §212.81). The decision would be the implementation plan for this project. The FEIS discloses the monitoring that would occur to (see the monitoring section)
125	9	Snow Depth	The closest thing to a "scientific analysis" on snow depth in the DEIS is on page 35 which states, "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."â€¦."For this reason, a snow depth less than 12 inches for cross-country OSV use was not considered further." The DEIS presented no references regarding which literature was reviewed, whose professional judgement was used, what their professional qualifications are which qualify them to provide judgement on OSV, which agency professionals were contacted, and what process was used to arrive at this conclusion. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
125	10	Snow Depth	There is no science to say if other depths, such as 6" of snow or 2" of ice, would also meet objectives. Adequate snow is a moving target with many variables such as those listed above which have not be adequately vetted, scrutinized or analyzed. The DEIS must be deemed inadequate. The interdisciplinary team used the best available science, along with professional experience and knowledge in order to best achieve the objectives of the proposal and analyze the associated effects. Though there is limited “science”, the resulting snow depths presented and analyzed under each alternative represent the best available information based on science and professional experience. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.

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80	52	Snow Depth	While we understand the Forest Service's rationale for allowing OSV travel on designated routes when there are 6 or more inches of snow, versus the 12 or more inches required for OSV travel otherwise, we have concerns with this management approach. The DEIS goes into great detail describing the many impacts that OSVs may have on forest resources without sufficient snowpack to protect these resources. In addition, DEIS is clear in explaining that 6 inches of snow is insufficient for resource protection.30 Yet, the Forest Service is proposing to allow OSV use when there is just 6 inches of snow on designated routes. Given the Forest Service's limited enforcement resources, it will be impossible to patrol all of the designated routes to ensure that users are not venturing off these routes and into areas with insufficient snow. If the LNF wishes to allow OSV use on designated routes with fewer than 12 inches of snow in order to allow users to access higher-elevation areas with sufficient snow, the Forest Service must provide strict guidance on where this use is appropriate. We believe the approach described in Alternative 3 - where OSV use on roads with at least 6 inches of snow would be allowed on limited bases on specific, identified routes, as long as this use does not cause visible damage to the underlying surface and can be readily enforced31 - is the only feasible way that the LNF will be able to allow OSV use during times of insufficient snow and minimize impacts to water quality, soils, vegetation, and wildlife habitat. Alternative 3 addresses this concern.
125	14	Snow Depth	The DEIS uses the terms "visible surface damage" and "resource damage", but there is no definition for those terms. Please provide definitions so the public can comment. There may be visible evidence that someone has ridden or skied over a road, but that in itself is not damage. In winter sports, both motorized and non-motorized users may occasionally contact the underlying surface, but not cause damage. Grooves from skis or tracks will not be visible by spring. There may be puddles of standing water on a road, but this is not resource damage and is not considered sediment unless it is delivered to a watercourse. This is a road maintenance issue, not an OSV issue. From an engineering standpoint, visibility of the surface would generally provide the obvious reason to check for damage. Visible surface damage would equate to gouging of the underlying route or ground surface, resulting in a loss or relocation of surfacing material, affecting the underlying soil or infrastructure. Potential resource damage created by OSVs would be primarily displacement or destruction of surface resources, some of which would have the potential lead to other resource impacts such as changes in water quality.
121	18	Snow Depth	Throughout the DEIS, the metric for comparing OSV impacts between alternatives - from OSV noise to pollution to use conflict - is limited to variations in acres open to OSV. This method utterly fails to recognize, much less account for, the hours and the timing of OSV impacts which occur on the forest. The extended OSV use season resulting from LNF's proposed retrograde minimum snow depth allowance unquestionably will invite many additional hours of OSV noise and pollution over and above that which occur during the OSV season which is now delimited by an existing 12" snow depth minimum. Alternative 3 addresses this concern.

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121	19	Snow Depth	Though I outlined this concern in my 'scoping' comment (dated February 17, 2015) on this project, it appears to have been overlooked in LNF's environmental analysis. I found only one acknowledgement in the DEIS that a reduced snow depth minimum would prolong the season for OSV activity on LNF. That acknowledgement appears on page 111 of the DEIS, and a two-year review period is specified to assess the adequacy of the retrograde snow depth allowance in protecting cultural resources from OSV ground contact. Alternative 3 addresses this concern.
121	20	Snow Depth	concern certainly exists that the proposed allowance for unbound OSV activity in conditions of spring thaw will enable (if not invite) snow specialty motorists provisionally to cobble together routes over a landscape of discontinuous snow cover. This brings to mind all sorts of OSV impacts which otherwise would be avoided, such as increased trampling of thinly-protected vegetation and soils, increased damage to fens and bogs (valued riparian habitat), and the potential for myriad OSV impacts to interfere with wildlife by overlapping their vital springtime life-cycle events. Alternative 3 addresses this concern.
121	7	Snow Depth	LNF does not offer an action alternative which would retain the existing 12" snow depth provision to protect forest travel ways and the quality of water and other resources associated with them. Because the retrograde snow depth allowance will expand OSV use season, this unquestionably will generate additional OSV impacts such as to atmosphere and water quality - in the form of many additional hours of remotely-delivered OSV noise and exhaust contaminants. Alternative 3 addresses this concern.
121	6	Snow Depth	The fact that Alternative One - the 'no action' alternative - would perpetuate this (and other) non-compliance essentially disqualifies it as a management option for this project. This leaves three action alternatives; all three would halve - from 12" to 6" - the snow depth allowance for staging and operation of OSVs on LNF. This retrograde allowance is proposed for every action alternative even though the DEIS acknowledges that such allowance would increase (rather than minimize) the likelihood of at least some undesirable OSV impacts: "â€¦as a result of a minimum 6-inch snow depth on trails, there likely is a much higher risk of causing direct trail impacts such as displacement of the trail surface compared to having a 12- inch minimum snow depth for trail uses. A 6-inch snow depth can become much thinner and may not offer effective protection for the ground surface after several passes by OSVs."1 The only reason for this proposed change appears to be the idea that it will 'increase OSV access'. In fact, the change does not increase OSV access: OSV accessible areas are set forth on the Over Snow Vehicle Use Map (OSVUM); rather, LNF's proposed reduction in minimum allowable snow depth will serve to EXTEND THE SEASON for unbound (unsupervised, off-trail cross-country) OSV activity deeper into springtime (thawing) conditions. This concern is addressed by alternative 3. Snow depth restrictions are designed to avoid resource damage. The no-action alternative analyzes a 12-inch snow depth on trails. The FEIS discloses the results of the analysis that would determine which snow depth would be sufficient to achieve that objective.

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83	20	Soil	The Forest Service should disclose all of the information it has collected demonstrating there are no OSV impacts to soil or vegetation on the Lassen National Forest. The soil specialist report discloses all the effects of OSV use to the soil resource. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources. The report does not state that there are no effects to soil resource, but minimization criteria and design features will be implemented in order to minimize the potential effects to soils. Those criteria and design features to protect the soil resource can be found in Chapter 1 of the FEIS and the soil specialist report.
83	43	Water	The Forest Service should make its route designations based on best management practices (BMPs), including (1) locating designated routes away from high-value and sensitive resource areas; (2) not exceeding motorized route density thresholds based on best available scientific information in suitable habitat for relevant wildlife; (3) locating routes to maintain large un-fragmented, undisturbed, and connected blocks of habitat where OSV use is prohibited; (4) allocating unplowed roads fairly between designated OSV routes and non-motorized routes; (5) where necessary to designate OSV routes through non-motorized areas, locating and managing routes to minimize disturbance by imposing speed and idling limitations and ensuring that use is restricted to the trail itself; and (6) locating routes designated within open areas-especially groomed routes-to minimize environmental damage and conflicts with other recreational uses. See Attachment A. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
152	18	Water	It is also very disturbing, and is difficult to understand your plan to decrease protections for the soil and water, when there is "Incomplete and unavailable information and no surveys or field observations, site specific water quality or ground disturbance monitoring in the LNF". (page 73) All hydrology impacts are based on scientific literature. On page 75 it says that Recreation specialists monitor OSV and other winter recreation use. Isn't there some field observations from this personnel? Aren't there any written observations of problem areas, or photos of meadows, rutting, run-off, erosion or positive observations on trails or landings? Has the LNF had recreation specialists out on the ground in the last years? Due to budget cuts and short staffing has this monitoring been done? After all these years of OSV use, don't we know where problem or sensitive areas are? This information must be used in the final EIS analysis. There has to be more site specific information. I would also assume there will be lots of feedback from the forest for this year 2015-2016. After 4 years of drought, we have a significant amount of snow on the forest. There has to be information out there. Spring is a perfect time to take an OSV out there and take a "hard look". The FEIS discloses the potential effects of all alternatives on soil and water resources.
152	19	Water	It is also almost unbelievable to myself, as a non-motorized user, that meadows, springs, creeks and riparian areas have no protections under these plans. Water is the most important resource coming off the Lassen National Forest now and especially in the future. Meadows and headwater streams in the Sierras are recharge zones for freshwater replacement. Why aren't we planning for the future!? Protect the meadows and riparian areas with exclusion zones. Write this plan as subpart C intended - where OSVs are allowed only in designated areas and nowhere else. The FEIS discloses the potential effects of all alternatives on soil and water resources.

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83	47	Water	The Forest Service fails to ensure water quality standards are achieved for water quality limited waters. For example, the Forest Service notes that Lake Almanor is currently impaired for mercury and temperature. DEIS at 76. And we know that the lake is accessible to OSV use. But beyond these very general and vague statements, the agency fails to provide specific information about designated OSV trails or routes that might allow for additional adverse impacts to Lake Almanor. The Forest Service cannot prevent all access to Lake Almanor because we don't have jurisdiction over the whole shoreline. Alternative 2 prevents OSV access from NFS lands. It is also worth noting that Lake Almanor rarely freezes to the extent that an OSV could safely be operated on its surface.
83	16	Water	Despite these likely OSV impacts, the agency claims in its DEIS that any impacts to water quality will be negligible. DEIS at 65-96. The Forest Service assumes that trail grooming does not cause "substantial" impacts to water quality. DEIS at 70. It also assumes that OSV use on groomed trails with adequate snow cover would not cause "substantial" impacts to water quality. Id. The agency assumes cross-country off-trail OSV use will have negligible effect on ground disturbance and vegetation, including areas along streams and other waterbodies. Id. at 70-71. Yet the Forest Service fails to support these general and conclusory statements. The agency admits that it did not conduct any water quality sampling or hydrology assessments to support its assessment of OSV impacts, but instead relied on scientific literature. DEIS at 75. The Forest Service must either support its assumptions, or provide a more objective review of the likely impacts from OSV use on water quality. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
83	48	Water	The Forest Service must provide information as to the location of 303(d) watersheds based on California's most recent list, as well as information on where OSVs have the opportunity to cross frozen lakes or streams, and where those routes or areas run adjacent to lakes or streams. The FEIS discloses the 303(d) listed streams.
121	28	Water	I personally have reported (in April, 2001) 76 types of PAH which were measured in a sample of surface snow which had been freshly contaminated with exhaust from a two- stroke snowmobile. Since the long-term fate and persistent effects of these contaminants in remote waters are as yet incompletely understood, that fact alone challenges the DEIS' assumption that OSV emissions are inconsequential. There is potential for impacts and we analyzed the potential of contaminants reaching surface water in the FEIS. There is no conclusive evidence that poly-aromatic hydrocarbons would occur at levels which would cause significant impacts to water quality.
152	9	Water	Soil and water: Negative effects for soil resource, fisheries, botanical resources. In fact the hydrology report recommends no change to snow level requirements. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.

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152	17	Water	soil and hydrology are a significant issue and will have negative consequences. On page of the DEIS it states, "the proposed action has the most potential for impacts to soil as compared to alternative 3 & 4. Page 89 says, "Alternative one would best protect water resources due to the continued 12" minimum on groomed trails and 18" requirement for cross country use". "The 6" snow depth is "probably adequate" to mitigate and eliminate substantial water quality impact." Is "probably adequate" a scientific term? Obviously the hydrologist is not in agreement with the plan to decrease protections of soil and water in this DEIS. Page 4 of the aquatic report says, "wet meadows, springs, seep will be particularly sensitive to disruption. The report also says, "OSVs when operated cross country have potential for more widespread impacts due to potential for ground disturbance". Hydrology recommends a 6" snow depth only be for well surfaced, gravel or paved roads, page 84. The report also says on page 357, "meadows will be the most vulnerable, prone to compaction and rutting. A 12" uniform depth is recommended on page 354 by soils experts. The FEIS discloses the results of the analysis of the direct, indirect, and cumulative impacts of the alternatives to all relevant resources.
128	25	Wildlife	The USFS fails to consider how further stressors in core areas such as from the OSV Use project may threaten species persistence and recovery in the planning area. We considered scoping comments and comments on the DEIS to refine our analysis. Potential impacts to threatened, endangered, proposed, and Forest Service Sensitive species and their habitats are disclosed in the FEIS and BE.
128	4	Wildlife	I want to remind the USFS of its obligation to consider all scientific information in the adverse effects analysis. If the information is incomplete or unavailable, the Forest Service must make clear that such information is lacking. 40 C.F.R. Â§ 1502.22. If the information "is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the [EIS]." Id. Â§ 1502.22(a). If the information cannot be obtained due to exorbitant cost or unknown means of obtaining it, the agency must include additional information in the EIS, including statements that the information is incomplete or unavailable and the relevance of the information, a summary of existing credible scientific evidence, and the agency's evaluation of reasonably foreseeable significant adverse impacts "based on theoretical approaches or research methods generally accepted in the scientific community." Id. Â§ 1502.22(b). We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS and BE disclose incomplete or unavailable information and the assumptions used in light of incomplete and unavailable information. Best available scientific information was used for habitat modeling and disclosure of potential effects to species and habitats.

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128	31	Wildlife	According to the forest plan, one purpose for establishing the network was "to provide breeding areas and travel corridors to facilitate movement of individuals and genetic exchange throughout the length of the Forest." (Lassen National Forest 1992a, p. T--1). Despite this concern, the OSV Use DEIS fails to disclose or analyze the impacts to the forest carnivore network and its habitat values, contrary to NEPA. The NFMA also requires that all projects are consistent with the forest plans: all "plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans." 16 U.S.C. Â§ 1604(i). According to the Lassen Land and Resource Management Plan (LRMP; 1992), “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 and based upon a set of assumptions. “Habitat management areas (HMAs) were established using [the guidelines in Appendix T of the LRMP] 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 HMAs; this includes home range and travel corridors. Using the Appendix T methodology, marten and fisher habitat is managed under a no scheduled harvest prescription. The guidelines apply to timber management and, therefore, are not applicable to this project. However, best available scientific information was used to disclose impacts of the alternatives on marten and fisher and their habitats. Marten habitat was addressed at three scales: modeled suitable winter habitat, modeled connectivity corridors, and occurrence analysis of a cluster of observational data not included in the previous two models. Fisher was analyzed at two scales: suitable habitat and fisher concentration area. Based upon our findings, alternatives 1, 2, 3, and 4 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 or fisher.
152	13	Wildlife	California spotted Owl (CSO) will be affected during breeding and nesting periods as CSO lay eggs in March and April. 90% of the CSO PACs in the LNF are open to OSV use in alternative number 3. 96% of PACs are open in Alt. 1 & 2. As mentioned, CSO are known to be statistically declining in the LNF. It is unclear exactly what is causing this decline, however there are potentially many stressors. Having even 6% less of the PACs open to OSV use in alternative three will decrease one of the many stressors. The high use areas for OSV are within 0.5 miles of staging areas and groomed trails. 20 CSO PACs and 19 NGO PACs are within 0.25 miles of groomed trails in alternative 3 and higher numbers in the other alternatives. The final EIS needs to disclose exactly where these PACs are and take measures to protect them. LNF LRMP standards and guidelines require Limited Operation Periods (LOPs) for NGO starting February 15th. For CSO these LOPs start March 1st. One simple protection would be to stop plowing and grooming the trails at minimum March 1st. Follow your standards and guidelines. The final EIS will include maps showing California spotted owl PAC locations. “…Limited operating periods for old forest-dependent species apply only to vegetation management activities (Sierra Nevada Forest Plan Amendment Standard and Guideline 75).” The potential effects to California spotted owl and its habitat are disclosed in the FEIS.

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128	50	Wildlife	if OSV trails and compaction in SN red fox winter range compromises or even eliminates this deep snow barrier, then the OSV Use project may enhance and accelerate the negative impacts of climate change for SN red fox and marten. Climate change and reduced snowpack should also be part of the environmental baseline and inform the analysis of direct, indirect, and cumulative impacts. The USFS should carefully consider how allowing widespread OSV use in occupied SN red fox and marten habitat may act synergistically with climate change to compromise winter habitat in deep snow years and to endanger these species. We considered scoping comments and comments on the DEIS to refine our analysis. The BE discloses climate change as a threat to marten and stressor likely to lead to medium-level (impacting SNRF or its habitat at the population or sighting area level) impacts to Sierra Nevada red fox.
152	16	Wildlife	In your cumulative effects analysis you omitted the huge North Forty Nine, Grizzly and Creeks II logging projects. These areas have miles of groomed and ungroomed OSV trails and presumably many cross-county OSV users as they are high elevation. All of these projects encompass many, many CSO and NGO PACs and acres of Carnivore Habitat Management areas and corridors. Humboldt/Humbug Peaks are accessed from the Lake Almanor and Jonesville trailheads. This entire trail system traverses the ongoing Creeks II project and will traverse the Grizzly Project in the near future. The North Forty Nine Project is accessed by the popular Ashpan trailhead. This trail is the connection between LN Park and Thousand Lakes Wilderness for many forest species. Why were these very large logging projects omitted from your cumulative effects analysis? Why were these projects, that have high habitat for all old forest species on the LNF not mentioned in your analysis? How can your analysis be accurate without taking these projects into account? Please explain. The only place I saw Creeks II and Grizzly mentioned was in the Wildlife Report on page 195 regarding Ongoing and foreseeable actions. I never saw the North 49 project mentioned.
83	84	Wildlife	the Forest Service failed to consult as required by the ESA to ensure its proposed actions are not likely to jeopardize the continued existence of the endangered Sierra Nevada Yellow Legged Frog, threatened gray wolf, threatened northern spotted owl, threatened Central Valley spring-run Chinook salmon, or threatened Central Valley Steelhead. The Forest Service failed to consult to ensure its proposed actions are not likely to result in the destruction or adverse modification of these species' critical habitat. It failed to consult as to the impacts of the proposed action on the Shasta crayfish. And the agency failed to conference as required by the ESA to ensure its proposed OSV designations and grooming will not likely jeopardize the continued existence of the Pacific Fisher. The Pacific Southwest Regional Office has requested informal consultation for concurrence with a “not likely to adversely affect” determination for gray wolf and northern spotted owl; formal consultation for a “likely to adversely affect” determination for Sierra Nevada yellow-legged frog; and informal conferencing to a “not likely to jeopardize” determination for fisher. Since the request was made, the Fish and Wildlife Service has withdrawn the proposed rule to list the West Coast Distinct Population Segment of fisher [Federal Register 81(74)]. Therefore, informal conferencing is no longer required and the species has been placed on the Region 5 Regional Forester’s Sensitive Species (RFSS) list. It is addressed as a RFSS in the FEIS. A “no effect” determination was reached for northern spotted owl critical habitat. Therefore, consultation is not required.

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83	92	Wildlife	The U.S. Fish and Wildlife Service proposed to list the West Coast distinct population segment of fisher as a threatened species in 2014. 79 Fed. Reg. 60,419 (Oct. 7, 2014). Due to substantial scientific uncertainty and disagreement about data relevant to the listing determination, the Fish and Wildlife Service gave itself a 6-month extension for making its determination. 80 Fed. Reg. 19953 (April 14, 2015). Therefore a final determination will be made no later than April 7, 2016. Id. Despite its status as a proposed species, the Forest Service appears to have failed to conference with the Fish and Wildlife Service as to the likely impacts of its proposed action on the Pacific Fisher. The Fish and Wildlife Service has withdrawn the proposed rule to list the West Coast Distinct Population Segment of fisher [Federal Register 81(74)]; informal conferencing is no longer required and the species has been placed on the Region 5 Regional Forester's Sensitive Species (RFSS) list. It is addressed as a RFSS in the FEIS.
83	93	Wildlife	the Forest Service concludes in the DEIS that each of the alternatives of the Lassen National Forest Over-Snow Vehicle Use Designation Project may affect individuals, but will not jeopardize the Pacific Fisher. DEIS at 179. There is nothing in the DEIS supporting that the Forest Service conferenced with the Fish and Wildlife Service, drafted a biological assessment, or engaged in informal consultation with the Fish and Wildlife Service to support its determination. For the reasons set forth below, the Forest Service's determination that its proposed action is not likely to jeopardize the Pacific Fisher is flawed. The Fish and Wildlife Service has withdrawn the proposed rule to list the West Coast Distinct Population Segment of fisher [Federal Register 81(74)]; informal conferencing is no longer required and the species has been placed on the Region 5 Regional Forester's Sensitive Species (RFSS) list. It is addressed as a RFSS in the FEIS and potential impacts to the species and its habitat are disclosed.
83	94	Wildlife	the agency reasons that the proposed OSV designations will not modify any suitable habitat. DEIS at 179. This is difficult to comment on, since the agency did not provide a map of any known or estimated fisher locations in relation to the proposed action. It is also inconsistent with the agency's statement that OSV use within late-successional-forest habitats where fishers reside can cause disturbance or displacement from breeding or rearing habitats. DEIS at 176. The Forest Service explains that the fisher occurs in the "extreme southern portion of the forest." DEIS at 175. Fishers seem to be readily breeding on SPI land (industrial timber company), with additional den sites on the Lassen National Forest. As far as we can tell based on the agency's narrative description of fisher locations and dens, in comparison with the proposed action (Attachment E), there is significant overlap that is likely to lead to disturbance. We maintain that OSV use will not modify vegetative composition or structure of suitable fisher habitat under any of the alternatives. The potential impacts to fisher and its habitat, including the potential for noise-based disturbance, are disclosed in the FEIS. The project complies with Sierra Nevada Forest Plan Amendment Standards and Guidelines for Fisher and Marten Den Sites ("impacts to fisher dens sites will be mitigated where there is documented evidence of disturbance to the den site from existing recreation, off-highway vehicle route, trail, and road uses"). Maps showing fisher habitat and available fisher occurrence data for fisher locations will be included in the FEIS.

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83	95	Wildlife	The Forest Service states OSV use is unlikely to influence foraging or prey availability because fishers tend to be crepuscular11 when OSV use is low to non-existent. DEIS at 179. But the agency provides no support for its conclusory statement that OSV use is low to non-existent in twilight hours. The Forest Service reasons that noise from OSV use would be intermittent and short in duration within and in proximity to suitable fisher habitat. DEIS at 179. There is no basis for the conclusion that OSV use would be intermittent and short in duration. We considered scoping comments and comments on the DEIS to refine our analysis. The project BE includes a list of Lassen National Forest general OSV use assumptions based upon input from Lassen National Forest recreational staff and discloses the potential impacts of OSV use and related activities on fisher and its habitat, under each of the alternatives.
83	96	Wildlife	the agency reasons that the proposed OSV designations will not modify any suitable habitat. DEIS at 179. This is difficult to comment on, since the agency did not provide a map of any known or estimated fisher locations in relation to the proposed action. It is also inconsistent with the agency's statement that OSV use within late-successional-forest habitats where fishers reside can cause disturbance or displacement from breeding or rearing habitats. DEIS at 176. The Forest Service explains that the fisher occurs in the "extreme southern portion of the forest." DEIS at 175. Fishers seem to be readily breeding on SPI land (industrial timber company), with additional den sites on the Lassen National Forest. As far as we can tell based on the agency's narrative description of fisher locations and dens, in comparison with the proposed action (Attachment E), there is significant overlap that is likely to lead to disturbance. We maintain that OSV use will not modify vegetative composition or structure of suitable fisher habitat under any of the alternatives. The potential impacts to fisher and its habitat, including the potential for noise-based disturbance, are disclosed in the FEIS. Maps showing fisher habitat and available fisher occurrence data for fisher locations will be included in the FEIS.
128	42	Wildlife	None of the alternative in the DEIS minimize project impacts to wildlife. Alternatives 1, 2, 3 and 4 expose between 81--91% of marten habitat to high and moderate OSV use (DEIS Table 66. P. 189). There is no alternative that exposes less than 81% of all marten habitat on the LNF to high and moderate OSV use. Similarly, 32--34% of Sierra Nevada red fox "high reproductive habitat" would be affected by high and moderate OSV use depending on the alternative (DEIS Table 77, p. 214). 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, Pt.2). We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The potential effects to wildlife and its habitat are disclosed in the FEIS.

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128	43	Wildlife	Furthermore, there is no alternative that minimizes impacts beyond what would be considered by USFS wildlife experts to be "low impact". In a 2008 study on OSVs and marten, Zielinski et al. defined "low levels of disturbance" to marten by OSVs as one pass on a snowmobile every 2 hours in less than 20% of an individual marten home range. There are three problems with the DEIS on this issue. First, the DEIS does not examine OSV impacts to marten home range scale. Second, none of the alternatives in the LNF OSV Use project offer anything close to low levels of disturbance under this definition, especially on the weekends. According to the DEIS assumptions, OSV use occurs primarily on weekends between the hours of 10am and 3pm (DEIS page 123). In addition, LNF visitor use data reported 30 snowmobiles per weekend on any given individual trailhead. This averages to 12 passes per hour on an out--and-- back excursion, which is much higher than what is considered "low level disturbance" by Zielinski et al. Forest--wide, the DEIS estimates there are 106 vehicles during peak use hours on weekends (DEIS Table 47, page 131). An average outing lasts about 4 hours, according to NVUM data (DEIS Table 44, page 130). However, no further information is given about how many passes in what areas this could amount to. There is the potential for thousands of passes in some areas on some days, according the data in the DEIS. The impacts to marten home range remain unquantified, thereby posing an unknown risk to the species. Furthermore, no alternative offers low levels of OSV disturbance across the entire forest. By definition, every alternative exposes marten to high levels of OSV disturbance, the impacts of which are untested in the literature. This violates Executive Order direction to minimize impacts to wildlife during vehicle route designation. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
128	45	Wildlife	The DEIS' sanguine portrayal of fuel reduction impacts on marten in the area contradicts recent research by marten experts. The FEIS and BE disclose potential direct, indirect and cumulative impacts of the Over-snow Vehicle Use Designation Project alternatives on marten and its habitat.
83	66	Wildlife	The Forest Service notes that Marten are sensitive to recreation activities, and in particular snow activities. DEIS at 188. Despite these impacts, the agency proposes 91 percent of Marten reproductive habitat to be open to OSV use. See DEIS 191. The Forest Service in no way explains how it made these designations with the objective of minimizing harassment of a species like the Marten or minimizing disruption of its habitat. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
83	67	Wildlife	the Forest Service failed to show how it sought to minimize harassment of the Pacific Marten when designating OSV trails and areas. The Pacific Marten is a sensitive species and Management Indicator Species (MIS) on the Lassen National Forest. The Forest Service recognizes numerous documented detections of the Marten on the Lassen National Forest. DEIS at 187. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

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128	5	Wildlife	The Lassen NF proposes to open 947,120 acres of National Forest to OSV use, thereby exposing between 112,000 to 134,000 acres of high capability marten reproductive habitat to high and moderate OSV use (Table 17, BE/BA p.119--120). The DEIS and BE/BA only compare impacts to marten "reproductive habitat" under different alternatives (BE--BA Table 17, p.119; DEIS Table 67, p. 191). I was surprised to find only marten breeding habitat considered in the DEIS and BA/BE (p.116; DEIS p.188). All marten habitat on the forest is lumped and examined in the same coarse analysis, however, the BE acknowledges that "riparian areasâ€¦are important for [marten] foraging." (p.111). Indeed, Spencer et al. (1983) report marten "strongly prefer" riparian lodgepole associations in the central Sierra Nevada. Nevertheless, the USFS does not discuss any potential impacts from the project on riparian areas, foraging habitat, or foraging success under high levels of OSV use. I am left to wonder how much riparian or foraging habitat the project impacts, and in what way. According to Spencer et al. (1983), "…small, scattered pockets of old-growth forest may provide adequate marten habitat if supplemented by meadows or riparian habitats with forest access. However, extensive old-growth fir forests are the mainstay of marten populations in the Pacific states. These forests provide all marten requisites." The marten analysis considers both suitable habitat, as modeled by Rustigian –Romsos and Spencer (2010), and functional habitat connectivity, based on Kirk and Zielinski (2010). The suitable habitat model includes elevation, precipitation, stream density or distance to nearest stream, as well as a vegetation component. In addition, the minimum cross-country snow depth, under all of the alternatives, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality.
128	6	Wildlife	It is unclear why there is no project impact analysis for marten foraging habitat or riparian habitat. The Lassen OSV Use project will certainly affect these areas. Further, the DEIS and BE/BA exclusive focus on marten breeding habitat and omits important wintertime impacts that I expect to occur. OSV use is likely to affect dispersing or non--breeding marten during winter, yet this possibility is not discussed.1 As a result, the DEIS and BE/BA poses a significantly increased risk and uncertainty by relying on generalized habitat data to define marten habitat and total acres affected by OSV travel, without regard to different types of habitat, other than reproductive (eg. foraging and wintering). We considered scoping comments and comments on the DEIS to refine our analysis. The marten analysis considers both suitable habitat, as modeled by Rustigian –Romsos and Spencer (2010), and functional habitat connectivity, based on Kirk and Zielinski (2010). The suitable habitat model includes elevation, precipitation, stream density or distance to nearest stream, as well as a vegetation component. In addition, the minimum cross-country snow depth, under all of the alternatives, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality.
128	8	Wildlife	The USFS must properly evaluate and minimize the impact of OSV use for marten, their competitors, and their predators. 1 We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
128	9	Wildlife	There is no mention of bobcat in the DEIS or BE/BA effects analysis, yet predation likely poses population-- level risk to marten in the project area, particularly in combination with OSV facilitation of predators to winter range. We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS and BE disclose potential impacts of the alternatives on marten and its habitat, including the potential for OSV use to create vector pathways for competitors or predators.

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128	10	Wildlife	Yet another potential impact of OSV disturbance to marten is that OSVs could flush marten from resting areas and make them more vulnerable to predation. This impact is missing from the impacts analysis, except mention in a table that lists all project impacts to marten, including: "altered movement due to OSV use" (BA/BE p. 117). 1 The EIS should more deeply explore the consequences to marten of "altered movement", including what proportion of total impact would involve "altered movement." The EIS should also describe how each impact listed contributes to the determination. The BE/BA does not provide separate in depth discussion of each of the project impacts, as required by NEPA. Rather, all impacts are lumped together on the vast majority of the forest. This is not very informative. The USFS must first acknowledge the enormous risk OSVs pose to marten by exposing them to predators during wintertime, and acknowledge that OSVs facilitate predators in deep snow, and at least specify where and how this would occur. We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS and BE disclose potential impacts of the alternatives on marten and its habitat, including the potential for OSV use to create vector pathways for competitors or predators.
128	11	Wildlife	the OSV Use DEIS hardly mentions marten vulnerability to predation in the list of threats (p188). The Project's BE/BA mentions risk of OSV--facilitated coyote predation on lynx (p.116), but only addresses the threat to marten in bullet form, and this impact is not quantified, discussed, or compared between alternatives, or compared between trails, staging areas, etc.: "Other behavioral and habitat modification includesâ€¦creation of a vector pathway for competitors or predators." (BE/BA p.118). This brief mention of predation issues for marten is inadequate to inform the public or decision maker. Again, the question arises-- What are factors affecting this impact? What is the range of severity in OSV impacts, and where would they occur in relation to important areas on the forest for marten (eg. Humboldt Peak, Swain Mountain areas, and surrounding Lassen NP (maps in section 1g and 2a, below). We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS and BE disclose potential impacts of the alternatives on marten and its habitat, including the potential for OSV use to create vector pathways for competitors or predators. Maps of marten habitats and areas conducive to OSV use, where impacts to marten are most likely to occur, are included.
128	13	Wildlife	The OSV Use project ignores winter habitat needs of marten, and how OSV use is likely to interfere with their need to thermoregulate and take cover from predators during foraging. 1 Exposing 81--91% of marten habitat to OSV disturbance (Table 66, pg. 191 DEIS) is entirely unacceptable. We considered scoping comments and comments on the DEIS to refine our analysis. The marten analysis considers both suitable winter habitat, as modeled by Rustigian –Romsos and Spencer (2010), and functional habitat connectivity, based on Kirk and Zielinski (2010).

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128	14	Wildlife	Lassen area, marten showed a preference to 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). The BE/BA did not consider this research. To the contrary, the OSV Use BE/BA makes the leap that because marten occur in the project area, they are likely habituated to OSVs (p.118--19). There is no evidence to support this claim. The BE/BA incorrectly cited Zielinski et al. (2008) as the basis for this statement; however, the habituation hypothesis was one of several untested explanations for their results offered in the discussion section this article. Habituation was not what the Zielinski paper was examining in their research. On the other hand, the scientific research from the Lassen area, cited above, did conduct a statistical analysis of this hypothesis, and found the opposite, that it appears marten in the Mt. Lassen area are distributing themselves across the forest in order to avoid contact with vehicles and humans. There are significant gaps in the scientific research drawn upon to make this impact analysis. We considered scoping comments and comments on the DEIS to refine our analysis. Potential impacts to marten and its habitat, overall, are disclosed in the FEIS and BE, despite that some individuals may be habituated to OSV use and related activities.
128	15	Wildlife	There is another assumption about marten and OSVs that was troubling in the OSV project BE/BA. The determination that martens tend to avoid the open areas preferred by OSV users, contradicts the current management reality (DEIS Alternative 1, p.vi) illustrated in the BE/BA (table on p. 117) in which 91% of high capability marten reproductive habitat is open to OSV use. The DEIS repeats a similar assumption that "martens tend to avoid open areas preferred by OSV users, decreasing the potential for disturbance or collision." (p.190). However, there are between 299,061 to 264,734 acres of high--capability marten habitat are open to OSV use depending on the alternative (BE/BA p.120). The assumption in the BE that marten are able to avoid areas preferred by OSVs does not match the reality of pervasive OSV use across the forest demonstrated in the project documents above. In fact, marten and other wildlife species have almost nowhere to go on the forest to avoid OSV disturbance under current management, or any other alternative proposed in the DEIS. An alternative that substantially reduces disturbance to wildlife has yet to be developed. We considered scoping comments and comments on the DEIS to refine our analysis. Potential impacts to marten and its habitat, overall, are disclosed in the FEIS and BE.
128	28	Wildlife	The DEIS did not address concern among scientists for marten habitat connectivity on the Lassen NF. We considered scoping comments and comments on the DEIS to refine our analysis. The marten analysis considers both suitable winter habitat, as modeled by Rustigian –Romsos and Spencer (2010), and functional habitat connectivity, based on Kirk and Zielinski (2010).

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128	29	Wildlife	OSV Use project area includes several areas identified by marten experts as key to marten persistence in the region. 1 OSV trails, staging areas, play areas and cross--country travel should be carefully examined separately in these key areas so that impacts can be minimized. In an area like Humboldt Peak and the front country north, west, and south of Lassen NP where marten populations are struggling the DEIS fails to recognize or protect these key areas for marten conservation. We considered scoping comments and comments on the DEIS to refine our analysis. The marten analysis considers both suitable winter habitat, as modeled by Rustigian –Romsos and Spencer (2010), and functional habitat connectivity, based on Kirk and Zielinski (2010). Both of these habitat models cover the entire Lassen National Forest. Although 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.
128	36	Wildlife	Similarly, marten telemetry studies (Figure 7 from Kirk 2007; Figure 3.1 from Moriarty 2014 below) were used to delineate areas of importance to individuals and populations of marten in the project area. As discussed above, the Lassen OSV project has the potential to interfere with important movement corridors linking Pacific marten populations on the Lassen NF with those on the Plumas NF. Furthermore, the project threatens to disturb or displace marten in their core winter range. The project impacts in specific areas where marten are known to occur (see maps below), and areas identified by marten experts as key to marten persistence in the area, are not considered in the project effects analysis, contrary to NEPA and NFMA.1 We considered scoping comments and comments on the DEIS to refine our analysis. The marten analysis considers both suitable winter habitat, as modeled by Rustigian –Romsos and Spencer (2010), and functional habitat connectivity, based on Kirk and Zielinski (2010). Both of these habitat models cover the entire Lassen National Forest. Although 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.

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128	40	Wildlife	The NFMA requires that all projects are consistent with the forest plans: all "plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans." 16 U.S.C. Â§ 1604(i). The BE/BA mentions marten den sites occur in the project area (p.121), there were also marten den sites identified in the Creeks II project, and there are probably other den sites as a result of all the telemetry studies on marten in the Lassen NF. Although vague mention of LOPs is buried in the BE/BA (p.121), the LOPs are not part of the proposed action or design features. The required LOP must be included as a project design feature for all proposed alternatives (from the 2004 SN Forest Plan Amendment ROD): "88. Protect marten den site buffers from disturbance from vegetation treatments with a limited operating period (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." "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." (ROD, p. 62). Sierra Nevada Forest Plan Amendment Standards 88 and 89 are disclosed in the Relevant Laws, Regulations, and Policies [that all projects must comply with] section of the project BE. Standard 88 only applies to vegetation management activities, but Standard 89 applies to this project. Limited operating periods will be applied as den sites are identified and as necessary. In addition, we considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
152	14	Wildlife	Pacific Marten will potentially experience increased predation, decreased availability of prey, stress from the noise and movement of machines and effects on denning and whelping. Pacific marten whelp in March and April. 91% of their habitat is open to OSV use in Alt 1. 81% of their habitat is open to OSV use in Alt. 3. This is another good reason to choose alternative three as the least destructive of the plans. LOPs are also required for Pacific Marten under the LNF standards and guidelines around den sites starting March 1st. As it is almost impossible to know where the marten den sites are, a simple protection would be again to stop grooming March 1st. Sierra Nevada Forest Plan Amendment Standard 89 applies to this project. Limited operating periods will be applied as den sites are identified and as necessary. In addition, we considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
128	54	Wildlife	There is a 7% difference in acres of marten habitat disturbed by high levels of OSVs use between alternatives. Moderate and low levels of OSV disturbance differ more for marten, about 20% between alternatives. In addition to habitat disturbance, snow depth requirement and number of routes (Table 67 DEIS p.191) are too similar to give a reasonable range of alternatives to consider. We considered scoping comments and comments on the DEIS. Potential impacts to marten and its habitat are disclosed in the FEIS and BE.

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128	24	Wildlife	the critical importance of deep snow habitat for marten is described in the previous sections (Krohn et al. 1997; Buskirk and Ruggiero 1994), but the potential for the project to reduce or eliminate this habitat is not recognized in the project BE/BA: "Habitat would not be physically modified by OSV useâ€¦under any of the alternatives." (p.121). This is incorrect and must be corrected to ensure a hard look at project impacts to marten and red fox, and to ensure the viability of these species. We considered scoping comments and comments on the DEIS to refine our analysis. We maintain that OSV use will not modify vegetative composition or structure of suitable marten habitat under any of the alternatives. OSV use is not consistent across all available habitat. Although we don't know specifically where impacts will occur at any given time and we cannot quantify the amount of impact contributing to snow compaction to the subnivean space, we know the potential for impacts would be greatest in areas most conducive to OSV use. The effects of snow compaction, with respect to marten, Sierra Nevada red fox, and subnivean species are disclosed in the FEIS. The FEIS discloses that habitat modification can occur when 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, or other mammal populations through increased competition and predation. Competition and predation, if occurring, would be predictably restricted to areas in the immediate vicinity of trails. It is also unknown whether or not packed trails resulting from snowmobile use are facilitating predator or competitor incursion into deep snow areas; if it 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. 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 as a result of OSV program activities. 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 (USFWS 2015).
128	49	Wildlife	Climate change and reduced availability of deep snow will undoubtedly amplify negative impacts of snowmobiles on marten, as well. Synergistic effects of climate change and predator pressure (as illustrated by Moriarty's 2014 dissertation on the Lassen NF) have not been addressed in the effects analysis for the LNF OSV Use project. 1 We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS discloses generally effects of climate change to wildlife species (birds, mammals, reptiles, and amphibians) and the BE discloses climate change as a threat to marten.
152	11	Wildlife	We are very concerned about the continued, and potentially increased use of OSVs impact on the wildlife of the LNF. On page 11 you outline effects on terrestrial and aquatic wildlife. The effects are all negative. On page 251 you show percentages of high quality habitat affected by OSV use. These are significant. However, all your determinations say "the plan may affect individuals, but will not lead to a trend toward listing or decreased viability for the species". As you are aware, each and every Environmental Impact Statement and Environmental Assessment for the LNF has the same determination. At the same time, California Spotted Owl (CSO) are in decline and we know from specific LNF studies that Pacific Marten are struggling on the LNF. Page 11 is a portion of the list of issue statements. Those statements are not determinations of the effects that would likely occur. They are the potential cause-effect relationships that we identified to consider and analyze in depth in the DEIS. The determinations are the results of the analysis of the potential cause-effect relationships and they are in chapter 3.

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128	44	Wildlife	The DEIS points out differences between routes in their potential to facilitate cross country travel. Comparing the potential for cross country travel among alternatives and between proposed OSV routes and areas could help the ID team, the public and decision makers to identify staging areas and trails that have a greater impact on wildlife than others. The LNF could use this data to tailor a decision that could minimize impacts on wildlife such as marten and SN red fox, as required. Ultimately, the USFS should develop a preferred alternative that minimizes negative OSV impacts to wildlife. Comparison of impacts of various areas, trails, staging areas and cross--country area impacts to important areas for marten and SN red fox will be key to identifying and developing this alternative. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
128	51	Wildlife	The difference between impacts to marten and SN red fox from Alternative 1--4 is small: every alternative's impact to these species is similar or identical. For example, there is no difference between impact of Alternative 1 and 2 on SN red fox or marten. They will impact marten habitat the same amount, exposing 63,585 acres to high OSV use, and 70,613 acres to moderate OSV use, and 67,112 acres to low OSV use (table 67, p.191 DEIS). Alternatives 1 and 2 will also impact SN red fox habitat on the same 15,598 acres. (DEIS p.214). Then, Alternative 3 will disturb 57,354 acres of marten habitat to high OSV use, and 55,529 acres to moderate OSV use, and 60,875 acres to low OSV use (table 67, p.191 DEIS); and will expose 14,060 acres of SN red fox to OSV disturbance (DEIS p.214). Alternative 4 will disturb and modify 63,191 acres of marten habitat to high OSV use, and 67,021 acres to moderate OSV use, and 65,284 acres to low OSV use (table 67, p.191 DEIS); and will expose 14,951 acres of SN red fox habitat to OSVs (DEIS p.214). As illustrated in the paragraph above, there is a 4% difference in acres of SN red fox habitat disturbed by OSVs between all alternatives. We considered scoping comments and comments on the DEIS. Potential impacts to marten and Sierra Nevada red fox, and their habitats, are disclosed in the FEIS and BE for each of the alternatives, The acres and percentage of habitat impacted are the results of the analysis.
128	1	Wildlife	Based on my wildlife biology experience, the USFS has not yet thoroughly disclosed project impacts to two rare forest carnivores, the Sierra Nevada red fox and Pacific marten. And, the agency has not developed an alternative that avoids substantial negative impacts to wildlife. We considered scoping comments and comments on the DEIS. Potential direct, indirect and cumulative impacts to marten and Sierra Nevada red fox, and their habitats, are disclosed in the FEIS and BE for each of the alternatives, In addition, we considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
128	2	Wildlife	The LNF OSV project has the potential for substantial impacts on Pacific marten and Sierra Nevada red fox. However, these impacts have not been adequately disclosed, as required by the National Environmental Policy Act ("NEPA"). Potential direct, indirect and cumulative impacts to marten and Sierra Nevada red fox, and their habitats, are disclosed in the FEIS and BE for each of the alternatives.

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128	30	Wildlife	The USFS should to examine impacts to Pacific marten and Sierra Nevada red fox at multiple scales-- at the individual, home range, and population scale in order to properly disclose impacts to these species by the OSV project. At the landscape scale, the DEIS did not consider impacts to the Lassen NF carnivore network, as required by NEPA. The forest carnivore ("furbearer") network was set aside to protect important marten and fisher habitat and should be protected from disturbance. Although the forest carnivore network is no longer a land allocation under the 2004 ROD, the ecological and habitat values that were recognized by the Forest Service in designating the network must still be recognized and analyzed in the DEIS. According to the Lassen Land and Resource Management Plan (LRMP; 1992), "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 and based upon a set of assumptions. "Habitat management areas (HMAs) were established using [the guidelines in Appendix T of the LRMP] 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 HMAs; this includes home range and travel corridors. Using the Appendix T methodology, marten and fisher habitat is managed under a no scheduled harvest prescription. The guidelines apply to timber management and, therefore, are not applicable to this project. Furthermore, OSV use and related activities, under all of the alternatives, would not physically modify the vegetative structure or composition of marten, fisher, or Sierra Nevada red fox habitat. However, best available scientific information was used to disclose impacts of the alternatives on marten, fisher, Sierra Nevada red fox, and their habitats. Marten habitat was addressed at three scales: modeled suitable winter habitat, modeled connectivity corridors, and occurrence analysis of a cluster of observational data not included in the previous two models. Fisher was analyzed at two scales: suitable habitat and fisher concentration area. The FEIS and BE disclose potential impacts to the Sierra Nevada red fox and its habitat based upon suitable habitat, as modeled by Cleve et al. (2011), and with respect to stressors to the subspecies and individual sighting areas (i.e. populations) identified by the U.S. Fish and Wildlife Service (2015), as available.

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128	32	Wildlife	The Lassen NF OSV project DEIS has the potential for substantial impacts on wildlife species, thereby threatening their viability. The OSV Use DEIS fails to consider the overall effect of the project on the Sierra Nevada red fox and Pacific marten. As discussed below, the Sierra Nevada red fox is in a critical state, and to comply with NFMA's viability and diversity protection requirements, the Forest Service must avoid any possibility of leading to a trend toward federal listing of the Southern Cascades sub--population. Based on the information that is presented in the DEIS, it appears that Alternatives 1--4 have the potential to harm and threaten the viability and distribution of the Sierra Nevada red fox, as well as Pacific marten. The FEIS and BE disclose potential impacts of the alternatives on marten, Sierra Nevada red fox, and their habitats. Marten habitat was addressed at three scales: modeled suitable winter habitat, modeled connectivity corridors, and occurrence analysis of a cluster of observational data not included in the previous two models. Potential impacts to the Sierra Nevada red fox and its habitat are disclosed in the FEIS and BE based upon suitable habitat, as modeled by Cleve et al. (2011), and with respect to stressors to the subspecies and individual sighting areas (i.e. populations) identified by the U.S. Fish and Wildlife Service (2015), as available. Based upon our findings, alternatives 1, 2, 3, and 4 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 or Sierra Nevada red fox.
128	46	Wildlife	Marten and Sierra Nevada red fox are among the many California species found with AR post--mortem. This emerging threat to these species was not identified or considered in the cumulative effects analysis to marten on the LNF OSV Use project.1 Without this information, impacts from the project may appear less consequential than they truly are given their possible extent. We considered scoping comments and comments on the DEIS to refine our analysis. Threats to marten and both general and relevant potential stressors to Sierra Nevada red fox are disclosed in the project BE.
128	53	Wildlife	Further evidence that there is little real difference between the alternatives, the BE/BA (p. 120 and141) discusses all cumulative effects to wildlife in a brief discussion that does not distinguish between alternatives; rather, all project alternatives have the same cumulative effect on marten and SN red fox according to the effects analysis. Those are the results of the analysis.
148	46	Wildlife	While we are pleased to see that the Forest Service conducted soundscape modeling, there is no apparent effort to translate the results of the modeling exercise to the identification of OSV areas or trails that minimize noise impacts. Nor is there any attempt to run the model in the context of minimizing acoustic impacts to wildlife based on the best available scientific information.29 Instead, the DEIS states that the results of the model may be used to "determine appropriate actions to help mitigate" future potential recreational use conflicts identified through monitoring.30 Potential future mitigation does not satisfy the obligation to apply relevant data to locate areas and trails to minimize impacts in the first instance. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary. The potential effects to wildlife and habitats, including the potential for noise-based disturbance, are disclosed in the FEIS.

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83	88	Wildlife	The northern spotted owl is listed as threatened under the ESA. The Forest Service determined, apparently without consulting with the Fish and Wildlife Service, that the proposed OSV trail and area designations and trail grooming may affect but is not likely to adversely affect the northern spotted owl. DEIS at 174. There is no indication that the Fish and Wildlife Service concurred with this determination. The Forest Service must consult on the impacts of this proposed action on the northern spotted owl. The Pacific Southwest Regional Office of the Forest Service is in the process of requesting consultation and concurrence from the U.S. Fish and Wildlife Service for this project for its determination of effect on the northern spotted owl and other federally listed wildlife species. Concurrence with a determination is required prior to a signed decision.
83	89	Wildlife	The determination is flawed. It states that northern spotted owl habitats are not near infrastructure, snowparks, parking lots, designated ungroomed and groomed trails. But the Forest Service ignores northern spotted owl habitat within the areas designated for OSV use. See DEIS at 171 (Table 58, stating that 4,519 acres open to OSV use overlaps with the species' disturbance distance thresholds). The Forest Service provides no map showing the locations where northern spotted owls have been observed in the past, in comparison to the proposed OSV trail and area designations. This leaves the public with little basis to analyze the agency's conclusion. Maps of known locations of northern spotted owl observations, PACs, if applicable, and designated critical habitat within the project area are provided in the FEIS.
83	90	Wildlife	The Forest Service's determination as to the impact of the proposed OSV designations on designated critical habitat on the Lassen National Forest is similarly flawed. The agency concludes that its action will have no effect on northern spotted owl designated critical habitat. But the agency states that northern spotted owl critical habitat exists in the northwestern portion of the Hat Creek Ranger District. It is unclear because the agency does not provide a map in its analysis, but it seems as if the agency proposes a majority of the northwestern portion of the Hat Creek Ranger District to be designated open to OSV use. See, e.g., Attachment E (map of proposed action from DEIS at 20). Therefore, cross-country OSV travel within this area is likely to affect critical habitat. The agency should have consulted with the Fish and Wildlife Service about these impacts. Maps of known locations of northern spotted owl observations, PACs, if applicable, and designated critical habitat within the project area are provided in the FEIS. A “no effect” determination was reached for northern spotted owl critical habitat. Therefore, consultation is not required.
152	12	Wildlife	On page 167 you state "interactions are poorly documented between OSVs and wildlife". The Wildlife report says there is "potential for OSV effects". The DEIS outlines effects on all animals including decrease in their winter range, increased flight due to noise and movement of OSV causing increased stress and energy use, potential for increased predation by coyote, crushing of prey in sub-nivien spaces. This is a summary of what’s in the wildlife section of the DEIS.

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128	23	Wildlife	The OSV Use project does not describe how OSVs, trail grooming, cross--country OSV travel, and other related activity would compact deep snow, thereby modifying the habitat by reducing or eliminating its availability. In addition, the project does not carefully consider or quantify the potential for the OSV Use project to facilitate coyote incursions into deep snow habitat; however, current research points to this emerging issue (Perrine 2005; Kolbe et al. 2007; USFWS 2015a). The elimination of deep snow habitat from OSV compaction should be carefully quantified and located spatially. We considered scoping comments and comments on the DEIS to refine our analysis. OSV use is not consistent across all available habitat. Although we don't know specifically where impacts will occur at any given time and we cannot quantify the amount of impact contributing to snow compaction to the subnivean space, we know the potential for impacts would be greatest in areas most conducive to OSV use. The effects of snow compaction, with respect to marten, Sierra Nevada red fox, and subnivean species are disclosed in the FEIS. The FEIS discloses that habitat modification can occur when 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, or other mammal populations through increased competition and predation. Competition and predation, if occurring, would be predictably restricted to areas in the immediate vicinity of trails. It is also unknown whether or not packed trails resulting from snowmobile use are facilitating predator or competitor incursion into deep snow areas; if it 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. 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 as a result of OSV program activities. 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 (USFWS 2015).
128	47	Wildlife	The project DEIS fails to recognize how OSV use eliminates deep snow habitat by facilitating predator incursion into this refugia; and, how this predator facilitation in deep snow years acts synergistically to accelerate the effects of climate change in low snow years where coyote have access to more of the fox's winter range. It is unknown whether or not packed trails resulting from snowmobile use are facilitating predator or competitor incursion into deep snow areas; if it 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. 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 as a result of OSV program activities. The FEIS discloses that, at this time, the best available data (USFWS 2015) 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; 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 area; and, as climate change progresses, climatologists predict that snowpacks are expected to diminish in the future, so 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.

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128	20	Wildlife	The USFS must consider site--specific information such as the amount and intensity of OSV disturbance in SN red fox habitat within the context of the critically endangered Southern Cascades DPS. The USFS must develop an alternative that substantially reduces disturbance and harassment to this rare and declining carnivore. The FEIS discloses the potential impacts to Sierra Nevada red fox. We considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
128	39	Wildlife	climate change and reduced snowpack should also be part of the environmental baseline and inform the analysis of direct, indirect, and cumulative impacts. For a subpopulation of SN red fox that is isolated and declining, the risk posed by the project increases the likelihood of federal listing and extinction. The FEIS, and accompanying BE, disclose predicted potential changes to Sierra Nevada red fox habitat from climate change.
128	7	Wildlife	Project impacts on winter habitat for SN red fox are not considered. All the tables and discussion in the BE are focused on "high reproductive habitat" (BE/BA table on p. 136). Cleve et al. (2011) developed a habitat model to predict SN red fox occurrence for this area, and their habitat model should be used instead.1 In this way the USFS did not take a hard look at impacts to SN red fox winter habitat, resting habitat, or foraging habitat, similar to marten in this section. The FEIS and BE disclose impacts to Sierra Nevada red fox and its habitat, based upon suitable Sierra Nevada red fox habitat as modeled by Cleve et al. (2011).
128	16	Wildlife	Similar to the Pacific marten issues described above, the USFS estimates between 59--66% of SN red fox reproductive habitat will be open to OSV disturbance under all alternatives (DEIS p.214). Yet, SN red fox is "extremely sensitive to human disturbance" (Buskirk and Zielinski 2003). Of further concern is that the USFS dismisses OSV impacts to SN red fox by citing the USFWS Species Report estimation that the impact of vehicle collisions on SN red fox will be minor, resulting in a low-- level impact to the subspecies (BE/BA p.138). The USFWS determination that vehicle strikes do not pose a high impact to the subspecies does not dismiss vehicle impacts at the project--level. An estimated "small number of individuals will be struck by vehicles" in the project area (Ibid) may indeed have population--level impacts to Sierra Nevada red fox leading to a trend toward federal listing, because the subpopulation is so small (Sacks et al. 2010). The FEIS and BE disclose that Sierra Nevada red fox in the Lassen sighting area commonly use roads to travel on, so the extent to which a given road is beneficial or detrimental may depend on traffic, particularly during dusk, dawn, and at night when Sierra Nevada red foxes are most active (Perrine 2005). It also discloses that since vehicles occasionally kill or injure individual Sierra Nevada red foxes, without rising to the level of affecting entire populations or the subspecies as a whole (now or in the future), the Service considers vehicles to constitute a stressor with a low-level impact on Sierra Nevada red fox (USFWS 2015). Areas conducive to OSV use overlap with roughly 30% of suitable Sierra Nevada red fox habitat, under each of the alternatives. Within that 30% of suitable habitat, is where the potential for OSV-related impacts, including injury or mortality to individuals, would be most likely to occur. Furthermore, the potential for injury or mortality would be extremely low because snow grooming equipment travels slowly (3 to 6 mph, California Department of Parks and Recreation 2010) and Sierra Nevada red fox is most active during dusk, dawn, and at night when OSV use is infrequent on the Lassen National Forest.

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128	18	Wildlife	I noticed that the DEIS and BE/BA weigh noise disturbance and other potential project impacts in terms of a threat to the Sierra Nevada red fox. A threat assessment is the standard by which the USFWS decides if listing a species under the ESA is warranted. However, this is not the standard the USFS is directed to gauge project impacts to protected species. The USFS should identify impacts to individuals, populations, and species in a different way. The impact of vehicle strikes is not discussed in the context of the OSV project (other than as a table), and therefore the USFS is likely to underestimate project impacts to SN red fox. This goes for other impacts as well, such as deep snow compaction, facilitation of coyote into SN red fox winter habitat, noise disturbance, etc. The "threat" standard per USFWS, is confused throughout the SN red fox effects analysis and should be corrected. The FEIS and BE disclose potential impacts of the alternatives on Sierra Nevada red fox and its habitat with respect to stressors to the subspecies (USFWS 2015), when applicable. For each stressor, the U.S. Fish and Wildlife Service summarized the best available scientific information relating to its potential direct and indirect impacts on Sierra Nevada red fox. This information was useful in making a determination of effects for Sierra Nevada red fox for each of the alternatives under consideration because low-level impacts are based on stressors that impact individual SNRF or result in a minor amount of habitat impacts currently or in the future; and medium-level impacts are based on stressors that are impacting SNRF or its habitat at the population (or sighting area) level currently or in the future, as compared to a low-level impact.
128	19	Wildlife	Despite the determination in the BE/BA that "Noise disturbance is not a key threat to the [SN red fox] species." (p.142), it appears noise disturbance in the project area may be both pervasive and intense, with 34% of high quality fox breeding habitat exposed to high or moderate levels of OSV noise disturbance (BE/BA, Table 24 p.140). The USFS defines OSV use (DEIS p. 25) as: High-- areas within 0.5 miles of staging areas, groomed trails, or meadows within 0.5 mi. of groomed trail; Moderate-- areas within 0.5 mi of marked trails, areas between 0.5 to 1.5 mi of groomed trails, meadows >10 acres, 0.5--1.5 mi. from OSV trail; Low--to--No Use-- areas >1.5 mi. from groomed trail, areas > 0.5mi from areas where OSVs are prohibited, below 3,500', forested areas with >20% slope, meadows >30 acres that are 1.5 mi from an OSV trail. An estimated 30 OSVs use each trailhead for about 4 hours each weekend, and 7 each weekday. The DEIS does not explain how that this level of OSV use in such a large area does not have considerable impacts to SN red fox. OSV use is not consistent across all available habitat. Although we don't know specifically where impacts will 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 if or how much compacted trails resulting from snowmobile use are facilitating predator or competitor incursion into deep snow areas, we know the potential for impacts would be greatest in areas most conducive to 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 roughly 30% of suitable habitat, under each of the alternatives. 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 30% of Sierra Nevada red fox habitat. The potential for injury, mortality, noise-based disruption of feeding or breeding would be low because Sierra Nevada red fox is most active at dawn, dusk, and at night when OSV use on the Lassen National Forest is infrequent. Snow compaction near denning sites would be limited to a much smaller area and unlikely due to the specific denning requirements of the species.

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128	21	Wildlife	Of further concern, the DEIS states that SN red fox may be habituated to OSVs (p. 213). However, mere presence of an animal near a disturbance does not indicate habituation, or lack of serious impacts to wildlife. We considered scoping comments and comments on the DEIS to refine our analysis. Potential impacts to Sierra Nevada red fox and its habitat are disclosed in the FEIS and BE, despite that some individuals may be habituated to OSV use and related activities.
128	26	Wildlife	The USFS relies almost exclusively on excerpts from the USFWS 12--month finding on SN red fox (USFWS 2015b) to serve as a project impact analysis. Simply reproducing several pages from the 12--month finding does not constitute a hard look under NEPA, especially for an imperiled species such as SN red fox. This species deserves a much more honest and detailed consideration in the design of this project. The U.S. Fish and Wildlife Service recently released its 12-month finding on a petition to list Sierra Nevada red fox as threatened or endangered (USFWS 2015a). In addition, the Service released a Sierra Nevada red fox species report (USFWS 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, serves as the Sierra Nevada red fox subspecies account and existing condition information in the BE. The FEIS and BE disclose potential impacts to the Sierra Nevada red fox and its habitat based upon Sierra Nevada red fox habitat, as modeled by Cleve et al. (2011), and where that habitat intersects with areas conducive to OSV use. Potential impacts of the alternatives on Sierra Nevada red fox and its habitat were analyzed with respect to route-based impacts to wide-ranging carnivores, as described by Gaines et al. (2003), and stressors to the subspecies identified by the U.S. Fish and Wildlife Service (2015), when applicable. For each stressor, the U.S. Fish and Wildlife Service summarized the best available scientific information relating to its potential direct and indirect impacts on Sierra Nevada red fox. This information was useful in making a determination of effects for Sierra Nevada red fox for each of the alternatives under consideration because low-level impacts are based on stressors that impact individual SNRF or result in a minor amount of habitat impacts currently or in the future; and medium-level impacts are based on stressors that are impacting SNRF or its habitat at the population (or sighting area) level currently or in the future, as compared to a low-level impact.

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128	27	Wildlife	In the OSV Use BE/BA, six out of 10 pages of the SN red fox section are directly excerpted from the Federal Register (USFWS 2015b). Reliance on this source for verbatim species account information, such as identifying species range or prey, is somewhat understandable. On the other hand, simply providing verbiage from the 12--month finding to serve as an effects analysis on a USFS project encompassing between 960,000--970,000 acres is totally inadequate, and not scientifically or legally viable. The NEPA requires a site--specific, project--specific, hard look at project impacts to protected species. After pages of verbatim USFWS text, the OSV project's determination statement justifies the finding 'may affect, not likely to lead to a loss of viability or a trend toward federal listing' based on the statement that "Noise-- based disturbance is not a key threat to the species.", and, "The Service [USFWS] has determined thatâ€¦ vehicle collisions do not rise to the level of a threat currently nor are they likely to increase into the future." I am concerned that the USFS understand that simply tiering on an ESA petition finding does not equate an effects analysis for subsequent federal actions at the project scale under NEPA. The U.S. Fish and Wildlife Service recently released its 12-month finding on a petition to list Sierra Nevada red fox as threatened or endangered (USFWS 2015a). In addition, the Service released a Sierra Nevada red fox species report (USFWS 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, serves as the Sierra Nevada red fox subspecies account and existing condition information in the BE. The FEIS and BE disclose potential impacts to the Sierra Nevada red fox and its habitat based upon Sierra Nevada red fox habitat, as modeled by Cleve et al. (2011), and where that habitat intersects with areas conducive to OSV use. Potential impacts of the alternatives on Sierra Nevada red fox and its habitat were analyzed with respect to route-based impacts to wide-ranging carnivores, as described by Gaines et al. (2003), and stressors to the subspecies identified by the U.S. Fish and Wildlife Service (2015), when applicable. For each stressor, the U.S. Fish and Wildlife Service summarized the best available scientific information relating to its potential direct and indirect impacts on Sierra Nevada red fox. This information was useful in making a determination of effects for Sierra Nevada red fox for each of the alternatives under consideration because low-level impacts are based on stressors that impact individual SNRF or result in a minor amount of habitat impacts currently or in the future; and medium-level impacts are based on stressors that are impacting SNRF or its habitat at the population (or sighting area) level currently or in the future, as compared to a low-level impact.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
128	33	Wildlife	The OHV project BE/BA states the OSV Use Project is "not likely to lead to a loss of viability or a trend toward federal listing" for Sierra Nevada red fox (p.141). The Forest Service has not considered necessary information on distribution of individual Sierra Nevada red fox, their Lassen population, or suitable habitat to make that determination. In particular, the Forest Service does not discuss the locations of current home ranges of Sierra Nevada red fox in the project area even though location information is available (Perrine 2005; Cleve et al. 2010). As shown in the figures below, Sierra Nevada red fox are documented in the areas of Morgan Summit, and areas surrounding Swain Mountain, between Lassen National Park and Highway 44; and also the Humbug Summit area, where dispersing fox was recorded on camera in 2013 (USFWS 2015a). We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS and BE disclose potential impacts to the Sierra Nevada red fox and its habitat based upon sighting area (population level) information contained in the 12-Month Finding (USFWS 2015) and accompanying Species Report for the Sierra Nevada Red Fox (*Vulpes vulpes necator*; USFWS 2015), as well as suitable Sierra Nevada red fox habitat, as modeled by Cleve et al. (2011).
128	34	Wildlife	The LNF OSV Use project proposes high and moderate levels of disturbance across approximately 34% of the SN red fox "high capability" reproductive habitat in the project area (DEIS p.214). It is unclear how much of the Southern Cascades DPS is impacted by the proposed alternatives, but project impacts to the scale of the DPS (not project area) must be conducted to address viability concerns. Based upon information contained in the 12-Month Finding (USFWS 2015), the Lassen sighting area (population), which includes the project area, is part of the Southern Cascades distinct population segment (DPS) of Sierra Nevada red fox. The U.S. Fish and Wildlife Service found that the Southern Cascades DPS was not warranted for listing. The Southern Cascades DPS of Sierra Nevada red fox remains on the Region 5 Regional Forester's Sensitive Species (RFSS) list. It is addressed as a RFSS in the FEIS and BE. Species viability for RFSS is determined at the Forest Plan (i.e., forest boundary) level. The DPS is referred to in the determination of effect in the FEIS and BE.
128	35	Wildlife	the DEIS does not analyze the effects of the project - under any of the alternatives - on individual home ranges, or on the Southern Cascades DPS of Sierra Nevada red fox in the project area. Unfortunately any impact on Sierra Nevada red fox in the Lassen area, with the effective population hovering around 21 individuals (Sacks et al. 2010), may threaten viability of the species. Project impacts must be considered in light of this imperiled status; and, alternatives that minimize impacts to the species must be developed. We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS and BE disclose potential impacts to the Southern Cascades DPS of Sierra Nevada red fox, and its habitat, based upon sighting area (population level) information contained in the 12-Month Finding (USFWS 2015) and accompanying Species Report for the Sierra Nevada Red Fox (*Vulpes vulpes necator*; USFWS 2015), as well as suitable Sierra Nevada red fox habitat, as modeled by Cleve et al. (2011), Species viability for Regional Forester's Sensitive Species, such as the Southern Cascades DPS of Sierra Nevada red fox, is determined at the Forest Plan (i.e., forest boundary) level. We also considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
128	37	Wildlife	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). The DEIS and BE/BA significantly understates the precarious status of Sierra Nevada red fox in the project area. FEIS and BE Sierra Nevada red fox Lassen sighting area (that includes Lassen National Forest) information is based on the 12-Month Finding (USFWS 2015) and accompanying Sierra Nevada red fox species report (USFWS 2015), a comprehensive summary of known information about the subspecies' based on existing literature to date,
128	38	Wildlife	coyote and OSV facilitation of coyote into deep snow refugia are too quickly dismissed from the project analysis. The USFS does not properly consider the impacts of adding these stressors across 59--66% of high capability SN red fox reproductive habitat (DEIS p.214). We considered scoping comments and comments on the DEIS to refine our analysis. The BE and FEIS BE disclose potential impacts to the Sierra Nevada red fox and its habitat based upon sighting area (population level) information contained in the 12-Month Finding (USFWS 2015) and accompanying Species Report for the Sierra Nevada Red Fox (*Vulpes vulpes necator*; USFWS 2015), as well as suitable Sierra Nevada red fox habitat, as modeled by Cleve et al. (2011), Potential impacts of the alternatives on Sierra Nevada red fox and its habitat were analyzed with respect to stressors to the subspecies identified by the U.S. Fish and Wildlife Service (2015), when applicable. For each stressor, the U.S. Fish and Wildlife Service summarized the best available scientific information relating to its potential direct and indirect impacts on Sierra Nevada red fox. This information was useful in making a determination of effects for Sierra Nevada red fox for each of the alternatives under consideration because low-level impacts are based on stressors that impact individual SNRF or result in a minor amount of habitat impacts currently or in the future; and medium-level impacts are based on stressors that are impacting SNRF or its habitat at the population (or sighting area) level currently or in the future, as compared to a low-level impact.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
128	41	Wildlife	The USFS should fully align the OSV Use project with the Sierra Nevada Forest Plan. The 2004 Sierra Nevada Forest Plan 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 LNF OSV project impacts to den site locations are not discussed in relation to this requirement. No alternative is offered which seeks to comply with S&G #32 for issuing an LOP on the project and none of the alternatives minimize disturbance to Sierra Nevada red fox. The required LOP and ongoing monitoring in the project area must be included as a project design feature for all proposed alternatives. Sierra Nevada Forest Plan Amendment Standard 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] is disclosed in the BE as part of the Relevant Laws, Regulations, and Policies that the project must comply with. Although the standard technically only applies to vegetation management activities, the Sierra Nevada red fox section of the BE discloses that, If necessary, a limited operating period would be applied from January 1 to June 30 to avoid adverse impacts to breeding sites. Currently, there are no known Sierra Nevada red fox den sites on the Lassen National Forest. Therefore, the project complies with Sierra Nevada Forest Plan Amendment standard 32. In addition, we considered scoping comments and comments on the DEIS to develop minimization measures. These measures are disclosed in the FEIS and would be implemented where necessary.
128	48	Wildlife	Another significant risk factor for Pacific marten and Sierra Nevada red fox that is not adequately discussed in the OSV DEIS or BE/BA is climate change. We considered scoping comments and comments on the DEIS to refine our analysis. The BE discloses climate change as a threat to marten and stressor likely to lead to medium-level (impacting SNRF or its habitat at the population or sighting area level) impacts to Sierra Nevada red fox.
136	11	Wildlife	Protecting natural resources, such as wildlife and wildlife habitat The Forest Service analysis of OSV impacts on natural resources is inadequate. For example, when analyzing wildlife and wildlife habitat only one group of species - Subnivean Species: shrews, vole, deer mouse - shows differences between proposed alternatives in the percentage of habitat affected and percentage of habitat within high and medium OSV use areas. All other categories of species and groups of species list identical impacts for the four proposed alternatives. We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS and BE disclose potential impacts to subnivean species and habitat, qualitatively, based upon Gaines et al. (2003) and a study (Wildlife Resource Consultants 2004) specific to subnivean space and the effects of winter recreation on subnivean space in maritime snowpack conditions, such as those found in the Sierra Nevada Mountains. Quantitative impacts, based upon sensitive species that prey upon subnivean species, are also disclosed. For example, the acres and percentage of high-value California spotted owl habitat (including reproductive and foraging habitat) that is open to OSV use and conducive to OSV use, under each of the alternatives, is the amount of habitat in which there is potential for the general impacts to subnivean prey species to occur.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
83	19	Wildlife	Snowmobile use impacts small mammals that burrow under the snowpack. Specifically, snow packing by snowmobile use reduces the insulating value of the snow and increases mechanical barriers to small mammal movements beneath it. Jarvinen and Schmid (1971) found that snowmobile compacted snowfields increased the winter mortality of small mammals. They indicated that compaction inhibited mammal movements beneath the snow and subjected subnivean organisms to greater temperature stress. Snowmobiles also affect snowshoe hare and red fox mobility and distribution. (Joslin, G. et.al. 1999 p.4.8). The Forest Service should more clearly disclose the impacts of OSV use on small mammals. We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS and BE disclose potential impacts to subnivean species and habitat, qualitatively, based upon Gaines et al. (2003) and a study (Wildlife Resource Consultants 2004) specific to subnivean space and the effects of winter recreation on subnivean space in maritime snowpack conditions, such as those found in the Sierra Nevada Mountains. Quantitative impacts, based upon sensitive species that prey upon subnivean species, are also disclosed. For example, the acres and percentage of high-value California spotted owl habitat (including reproductive and foraging habitat) that is open to OSV use and conducive to OSV use, under each of the alternatives, is the amount of habitat in which there is potential for the general impacts to subnivean prey species to occur.
83	87	Wildlife	The gray wolf is listed under the ESA as threatened. The Forest Service notes observations of two adults and five pups in Siskiyou County, California. DEIS at 180 (the "Shasta Pack"). The Forest Service recognizes that gray wolves could occur within the project area, since part of the Lassen National Forest is in Siskiyou County. The majority of the Lassen National Forest located within Siskiyou County is open to OSV use. See Attachment E. The agency also recognizes that OSV use within habitats of wide-ranging carnivores can cause displacement or avoidance, displacement from breeding or rearing habitat, and physiological responses resulting in changes to heart rate and levels of stress hormones. DEIS at 181. It also notes an increased likelihood of collision with OSVs traveling at high speeds. Id. Ultimately, the agency concludes that the OSV designations may affect but are not likely to adversely affect gray wolves. Again, it appears the Forest Service failed to consult with the Fish and Wildlife Service on this determination. The determination is flawed. The most glaring example why is that the Forest Service states as a basis for its not likely to adversely affect determination that there are currently no known established wolf packs within the project area. This ignores the observed Shasta Pack in Siskiyou County, much of which would be open to cross-country OSV use under the Forest Service's proposed area designations. As another example, the agency provides no basis for its conclusion that noise from OSV use would be intermittent and of short duration. There is no information as to the volume of OSV use on the portion of the Lassen National Forest located in Siskiyou County. The Pacific Southwest Regional Office has requested informal consultation for concurrence with a “not likely to adversely affect” determination for gray wolf. We considered scoping comments and comments on the DEIS to refine our analysis. The FEIS and BE disclose potential effects to gray wolf and its habitat.

Letter #	Comment #	Topic	Comment Text and Forest Service Response
83	18	Wildlife	A wolverine was detected in 2008 near Truckee, California. DEIS at 216. There have been reports of unconfirmed wolverine sightings on the Lassen National Forest more recently. Id. The Forest Service notes that for this analysis, 40,276 acres of habitat exists within the project area. DEIS at 217. The Forest Service notes that potential threats to the wolverine include habitat loss, habitat fragmentation, loss and alteration of alpine habitat from climate change, and increasing human presence. DEIS at 217. The agency concludes that OSV use may impact individual wolverine, but it is not likely to lead to a loss of viability or trend toward federal listing. It bases this conclusion on its statement that suitable wolverine habitat would not be physically modified by OSV use. DEIS at 217. It is unclear how this can be, given that the majority of the forest is designated open to OSV use. See, e.g., Attachment E (map of proposed action from DEIS at 20). The Forest Service should provide a basis for its conclusory statements regarding impacts of OSV use on wolverine that seem to contradict the best available science. 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 (Moriarty et al. 2009). Although incidental, unconfirmed sightings of wolverine have been reported throughout the Sierra Nevada, including Lassen National Forest (Lassen National Forest 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 into the area (USFWS 2013). We maintain that OSV use, and related activities will not physically modify the vegetative structure and composition of wolverine habitat.
148	37	Wildlife	Locate routes to maintain large un-fragmented, undisturbed, and connected blocks of habitat where OSV use is prohibited. The FEIS discloses the direct, indirect, and cumulative impacts of each alternative on wildlife habitats based on potential impacts described in the best available scientific information.
148	36	Wildlife	Not exceed motorized route density thresholds based on best available scientific information in suitable habitat for relevant wildlife. We considered scoping comments and comments on the DEIS to refine our analysis. Route 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. The Lassen National Forest Land and Resource Management Plan (LRMP) has recommended route densities for the following species: fisher, 0 - < 0.5 mi/m^2 (preferred); pronghorn antelope < 2 mi/m^2; black bear, < 0.5 mi/m^2 (preferred). Therefore, all of the action alternatives would be consistent with preferred LRMP road density recommendations.

Appendix F. Biological Assessment

Introduction

The purpose of this Biological Assessment (BA) is to assess the likely effects in sufficient detail to determine if the proposed action may affect, and to what degree, federally endangered, threatened or proposed terrestrial animal species and/or their designated critical habitat. A BA is the means by which a determination is made whether a proposed federal action may or may not have an adverse effect on federally listed species. Section 7 of the Endangered Species Act of 1973, as amended, directs Federal departments and agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened, endangered or proposed species or result in the destruction or adverse modification of their critical habitat. The Act mandates consultation with the appropriate Secretary whenever an action is likely to jeopardize the continued existence of any species proposed for listing as threatened or endangered, or whenever an action might result in the destruction or adverse modification of critical habitat proposed for listing (50 CFR 402). This document has been prepared in accordance with the legal requirements set forth under Section 7 of the Endangered Species Act of 1973, as amended, [19 U.S.C. 1536(c), 50 CFR 402.12 (f), and 402.14 (c)], and follows standards established in the U.S. Department of Agriculture's Forest Service Manual (FSM 2670.31 and 2672.42). The U.S. Fish and Wildlife Service (FWS) list of Threatened, Endangered, and Proposed wildlife species for the Lassen National Forest was obtained through the FWS Information for Planning and Conservation website (https://ecos.fws.gov/ipac/) from the Klamath Falls, Sacramento, Yreka, and Nevada Fish and Wildlife Service offices, dated March 9, 2016. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). All listed species and critical habitats compiled from official species lists provided by the four FWS offices and considered for effects analysis are provided in Appendix A[1]. Listed aquatic species as well as plants are addressed in separate Biological Assessment and Evaluation documents under this project. The species and designated critical habitat considered in detail for effects analysis in this BA are:

Endangered

- Gray wolf

Threatened

- Northern spotted owl
- Designated critical habitat for northern spotted owl

Proposed[2]

- Wolverine

Species Dropped from Further Consideration

Two listed terrestrial wildlife species are dropped from further consideration because the project will have no effect on them, as described below.

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

[1] Since the IPAC lists were generated, the Forest Service has been directed by the U.S. Fish and Wildlife Service to address wolverine as federally-proposed for listing as threatened under the Endangered Species Act.
[2] Based upon Federal Register Vol. 81, No. 74, April 18, 2016 (USDI Fish and Wildlife Service 2016), the proposed rule to list fisher has been withdrawn.

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 southwest 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 2014a) shows that lands administered by the LNF (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). Therefore, it is my determination that all alternatives will 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 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 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 NF. Potential suitable habitats occurring downstream from the Lassen NF and outside the project area will not be affected by any alternative. Proposed critical habitat is located more than 10 miles from the project area. Due to the project area being outside the range of the species, or due to lack of suitable habitat or habitat components in the project area, it is my determination that all alternatives will have **no effect** on yellow-billed cuckoo or its proposed critical habitat.

Description of the Proposed Action/Preferred Alternative

Alternative 2 – Modified Proposed Action

The Forest Service proposes several actions on the Lassen National Forest to be analyzed as required by the NEPA (figure 1). The actions proposed are as follows:

1. To designate 323 miles of National Forest System snow trails on National Forest System lands within the Lassen National Forest as trails where public OSV use would be allowed when snow depth is adequate for that use to occur. All existing OSV prohibitions applying to trails where public motorized use is not allowed would continue.

- To designate 921,130 acres of National Forest System lands within the Lassen National Forest as areas where public, cross-country OSV use would be allowed when snow depth is adequate for that use to occur. This land area would represent approximately 80.1 percent of the National Forest System land within the Lassen National Forest. All existing OSV prohibitions applying to areas of the forest where public motorized use is not allowed would continue.
- To not designate (to prohibit public OSV use on) approximately 228,890 acres on the Lassen National Forest for public OSV use. These areas include all of the approximately 186,000 acres of the Lassen National Forest where public OSV use is currently prohibited, and 42,890 acres of areas currently open to OSV use that would not be designated for OSV use in this alternative.

- To implement Forest-wide snow depth requirements for public OSV use that would provide for public safety and natural and cultural resource protection by:
    a. Allowing public, cross-country OSV use in designated areas only when there are 12 or more inches of snow or ice covering the landscape based on weather and observations by Forest Service personnel and the public, to prevent impacts to surface and subsurface resources including, but not limited to, archaeological deposits, historic features, and historic properties; and
    b. Allowing public OSV use on designated snow trails when there are 6 or more inches of snow covering the trail. Except for approximately 0.1 mile of OSV trail (which would require 12 or more inches of snow for OSV use), all snow trails to be designated for public OSV use or identified for OSV grooming in all alternatives would overlay an existing paved, gravel, or native surface travel route. These travel routes are trails and roads used by wheeled motorized vehicles, and non-motorized recreation.
- To not designate for public OSV use any existing trail in an area where motorized use is currently prohibited on the Lassen National Forest.
- To designate 28 public OSV crossing points of the Pacific Crest Trail on crossings identified for wheeled motorized vehicle use. Two of the Pacific Crest Trail crossing points that would be designated are adjacent to private land.
- To establish a corridor for the Pacific Crest Trail, within which public OSV use would not be designated (public OSV use would be prohibited), except on 26 designated public OSV trails across this corridor. This corridor is included in the areas that would not be designated for public OSV use in item #3, above.
- Public OSV use that is inconsistent with the designations and snow depth requirements made under this decision would be prohibited under 36 CFR Part 261.
- To identify approximately 349 miles of snow trails that would be groomed for public OSV use by the Forest Service's Lassen National Forest Grooming Program.
- To groom OSV snow trails when there are 12 or more inches of snow, and formally adopt California State Parks' snow grooming standards requiring a minimum of 12 inches of snow depth before grooming can occur.
- Project design features, including minimization measures and monitoring procedures are described beginning on page 18 of this document.

The proposed actions are summarized in table 1 through table 8.

Table 1. Comparison of areas where OSV use would be allowed with total forest land area – current management and alternative 2

Area	Alternative 1 - Current Management*	Alternative 2 – OSV Designations
National Forest System Land Area within Administrative Boundary of Lassen National Forest (Acres)	1,150,020	1,150,020
Total Areas Open (Designated in Alternative 2) for Cross-country OSV Use (Acres)	964,020	921,130
Percentage of NFS Land Area Open (Designated in Alternative 2) for Cross-country OSV Use	83.8%	80.1%
Total Areas OSVs Not Allowed and Not Designated for OSV Use in Alternative 2 (Acres) (table 2)	186,000	228,890

*Because no Subpart C designations of areas and trails for OSV use have been made, areas and trails are not "designated," but are either "open" or "closed" to OSV use under current management.

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Table 2. Areas not designated for OSV use – current management and alternative 2 (acres)

Area	Alternative 1 - Current Management	Alternative 2 – OSV Use Not Designated
• Ishi Wilderness	40,910	40,910
• Caribou Wilderness	20,830	20,830
• Thousand Lakes Wilderness	16,570	16,570
• Proposed Wilderness Adjacent to SW Corner Lassen Volcanic National Park (LVNP) (Rocky Peak)	8,620	8,620
• Proposed Wilderness Southwest Corner of Forest	7,710	7,710
• Proposed Wilderness South Border of LVNP (Chummy Meadows)	4,890	4,890
• Proposed Wilderness East Side of Caribou Wilderness	890	890
• Pacific Crest Trail and Non-motorized Corridor	-	10,460
• Cub Creek RNA	4,090	4,090
• Blacks Mountain RNA	-	520
• Semi-primitive Non-motorized and Primitive Near Ishi Wilderness	22,320	22,320
• Semi-primitive Non-motorized Near Old Station and East of Hwy. 89 (Cinder Butte)	13,700	13,700
• Semi-primitive Non-motorized Chips Creek Area	7,400	7,400
• Semi-primitive Non-motorized Soda Creek Area	4,210	4,210
• Semi-primitive Non-motorized South of Mountain Meadows Reservoir Including Homer Deer SIA	3,370	3,370

Area	Alternative 1 - Current Management	Alternative 2 – OSV Use Not Designated
• Semi-primitive Non-motorized Snow Meadow Area	3,140	3,140
• Semi-primitive Non-motorized North of LVNP (East of West Prospect Peak)	2,610	2,610
• Semi-primitive Non-motorized Jackass Creek Area	1,800	1,800
• Semi-primitive Non-motorized Rock Creek Area	1,760	1,760
• Semi-primitive Non-motorized (East of Adobe Flat Reservoir - Shasta Trinity NF Managed by Lassen NF)	1,750	1,750
• Semi-primitive Non-motorized (West of Mayfield Ice Cave - Shasta Trinity NF Managed by Lassen NF)	1,070	1,070
• Semi-primitive Non-motorized Snow Mountain Area West of Old Station	700	700
• Semi-primitive Motorized Near Old Station East of Hwy. 89 (Hat Creek Valley)	12,110	12,110
• Semi-primitive Motorized Butt Mountain Area	1,660	1,660
• Semi-primitive Motorized SE of Old Station East of Hwy. 44 (Little Potato Butte)	630	630
• Roaded Natural Onion Springs Closure (West Border of LVNP)	1,080	1,080
• West Shore of Eagle Lake South of Spalding Tract Osprey Mgt Area	1,670	1,670
• Deer Creek Anadromous Fish Closure	-	1,520
• Butte Lake Closure (OSV prohibited except where restricted to trail only) North of LVNP	-	-
• Limited OSV Access in Southwest Corner of Lassen NF	-	27,400
• Below 3,500-foot Elevation in Southwest Corner of Lassen NF	-	-
• Fredonyer-Goumaz Closure (OSV prohibited except where restricted to trail only) Between Hwys 36 & 44	-	-
• McGowen Lake Non-Motorized Area (North of Mineral, East of Rd. 17)	-	-
• Colby Mountain Closure	-	-
• Southwest Shore Lake Almanor	-	1,840
• South Shore Eagle Lake	-	1,150
• Tippin Forest Order North of Hwy. 299	510	510
• Willard Hill Closure	-	-
Total Areas OSVs Not Allowed and Not Designated for OSV Use in Alternative 2 (Acres)	186,000	228,890

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Table 3. Designated groomed and ungroomed trails for OSV use – current management and alternative 2 (miles)

Snow Trails for OSV Use	Alternative 1 - Current Management	Alternative 2 – OSV Designations
Groomed and Ungroomed Snow Trails on Lassen NF for OSV Use (miles) (Includes groomed designated OSV trails in table 5)	2,760	323
Ungroomed Snow Trails where OSV Use would be Allowed (Designated in alternative 2) (miles)		
• PCT OSV Crossing Access Trails (table 4)	-	7
• Road 29N10	5	5
• Road 30N16 from 31N17 To McGowan OSV Closure	2	-
• Road 27N11 Ungroomed Designated SE of Jonesville	1	-
• Road (3xN17) West of McGowan Designated Ungroomed to Ashpan Groomed System	28	-
• Forest Road 21 & County Road 105 from Hwy. 44 to Eagle Lake	25	-
• Designated Ungroomed North of LVNP (Butte Lake)	22	-
• Road 32N46 in Ashpan Designated Ungroomed	4	-
• Ungroomed OSV Trail in OSV Prohibited Areas	12	-
• Other Ungroomed OSV Trail in Areas Open to Cross-country OSV Use (Marked and Unmarked)	2,350*	-**
Total Trails Open for OSV Use but not Groomed	2,449	12

*Most of these OSV trails are mapped on the Lassen National Forest's 2005 Winter Recreation Guide.

**The modified proposed action would not designate ungroomed OSV trails located within areas designated for public, cross-country OSV use.

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Table 4. Designated Pacific Crest Trail (PCT) OSV crossings – current management and alternative 2

OSV/PCT Crossing	Alternative 1 - Current Management	Alternative 2 – OSV Designations
Designated Pacific Crest Trail Crossing Points (#)	No PCT Crossing Points or Corridor*	28
Designated OSV Access Trails Through Designated Pacific Crest Trail Crossing Points by Road Name (miles)	-	8
• Pit River Canyon Rd (St Dr 50) - Only a crossing point designated in alternative 2. No PCT corridor or access trail designated due to lack of NFS jurisdiction on adjacent land.	-	Designated as Crossing Point Only
• St. Bernard So Rd. (Collins 1) - Only a crossing point designated in alternative 2. No PCT corridor or access trail designated due to lack of NFS jurisdiction on adjacent land.	-	Designated as Crossing Point Only
• 37N05 and 37N052Y - Designated Ungroomed	-	0.4
• 37N05 - Designated Ungroomed	-	0.4
• 37N5C - Designated Ungroomed	-	0.3
• 37N05 - Designated Ungroomed	-	0.2
• 37N02 - Designated Ungroomed	-	0.1
• 36N10 - Designated Ungroomed	-	0.2
• 36N36Y - Designated Ungroomed	-	0.2
• 36N09 - Designated Ungroomed	-	0.2
• 36N33B - Designated Ungroomed	-	0.2
• 35N10 - Designated Ungroomed	-	0.3
• 34N94 and 34N34 - Designated Ungroomed	-	0.6
• 33N22 - Designated Ungroomed	-	0.2
• 32N99 - Designated Ungroomed	-	0.2
• 32N20 - Designated Ungroomed	-	0.2
• 32N12 - Designated Ungroomed	-	0.3
• 32N92 - Designated Ungroomed	-	0.2
• 32N42Y - Designated Ungroomed, 0.095 mile not on underlying route.	-	0.3
• 29N97 and 29N27 - Designated Ungroomed	-	0.3
• 28N61 - Designated Ungroomed	-	0.8

OSV/PCT Crossing	Alternative 1 - Current Management	Alternative 2 – OSV Designations
• 28N16 - Designated Ungroomed	-	0.4
• 28N16 , 29N17, and 29N17J - Designated Ungroomed	-	0.3
• 27N11G - Designated Ungroomed	-	0.6
• 26N74 - Designated Ungroomed	-	0.2
• Humboldt Rd./28N43 - Designated Groomed Included in Jonesville Groomed Total	-	0.3
• Humbug Rd./BU915 - Designated Groomed Included in Jonesville Groomed Total	-	0.2
• 26N02/Cirby Meadows - Designated Groomed Included in Jonesville Groomed Total	-	0.3
Designated OSV Access Trails Through Designated PCT Crossing Points (#)	-	26
Designated Groomed OSV Access Trails Through Designated PCT Crossing Points - Jonesville Groomed Trail System (#)	-	3
Designated Groomed OSV Access Trails Through Designated PCT Crossing Points - Jonesville Groomed Trail System (miles)	-	1
Designated Ungroomed OSV Access Trails Through Designated PCT Crossing Points (#)	-	23
Designated Ungroomed OSV Access Trails Through Designated PCT Crossing Points (miles)	-	7

*OSV use is currently allowed adjacent to and across the PCT. Motorized use is prohibited on the tread of the PCT in all alternatives.

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Table 5. OSV trail systems groomed by the Lassen National Forest – current management and alternative 2 (miles)

Groomed OSV Trail System	Alternative 1	Alternative 2
La Tour State Forest Snowmobile Area		
• Groomed by Forest Service; Trail Not Under NFS Jurisdiction	20	20
• Groomed by Forest Service Under NFS Jurisdiction (Trail to be Designated in Alternative 2)	3	3
• Subtotal	23	23
Ashpan Snowmobile Area		
• Groomed by Forest Service; Trail Not Under NFS Jurisdiction	-	-
• Groomed by Forest Service Under NFS Jurisdiction (Trail to be Designated in Alternative 2)	34	34
• Subtotal	34	34

Groomed OSV Trail System	Alternative 1	Alternative 2
Morgan Summit Snowmobile Area		
• Groomed by Forest Service; Trail Not Under NFS Jurisdiction	2	2
• Groomed by Forest Service Under NFS Jurisdiction (Trail to be Designated in Alternative 2)	60	60
• Subtotal	62	62
Jonesville Snowmobile Area		
• Groomed by Forest Service; Trail Not Under NFS Jurisdiction	5	5
• Groomed by Forest Service Under NFS Jurisdiction (Trail to be Designated in Alternative 2)	64	64
• Subtotal	69	69
Swain Mountain Snowmobile Area		
• Groomed by Forest Service; Trail Not Under NFS Jurisdiction	-	-
• Groomed by Forest Service Under NFS Jurisdiction (Trail to be Designated in Alternative 2)	71	71
• Subtotal	71	71
Bogard Snowmobile Area		
• Groomed by Forest Service; Trail Not Under NFS Jurisdiction	-	-
• Groomed by Forest Service Under NFS Jurisdiction (Trail to be Designated in Alternative 2)	47	47
• Subtotal	47	47
Fredonyer Snowmobile Area		
• Groomed by Forest Service; Trail Not Under NFS Jurisdiction	-	-
• Groomed Lassen NF by Forest Service Under NFS Jurisdiction (Trail to be Designated on Plumas NF)	11	11
• Groomed by Lassen NF Forest Service Under NFS Jurisdiction (Trail to be Designated on Lassen NF in Alternative 2)	32	32
• Subtotal	43	43
Total OSV Use Allowed (Designated on Lassen NF in Alternative 2) and Groomed by Lassen NF	311	311
Total OSV Use Allowed (on Plumas NF) and Groomed by Lassen NF	11	11
Total Groomed but not Under NFS Jurisdiction	27	27
Grand Total Groomed	349	349

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Allowed OSV Use

Public OSV use would be designated on 323 miles of snow trails on the Lassen National Forest. Approximately 921,130 acres would be designated as areas where public, cross-country OSV use would be allowed, and snow would be subject to snow-depth restrictions.

Public OSV use would be prohibited on the Lassen National Forest unless there is adequate snow depth that meets the conditions in table 6. The minimum snow depth of 6 inches for public OSV use on snow trails with underlying roads and trails represents a change from current management. This change is to provide improved public trail access for OSV users from trailheads to deeper snow areas.

Table 6. 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 – current management and alternative 2

OSV Management	Alternative 1 – Current Management	Alternative 2
Minimum Snow Depth for Public OSV Use on Snow Trails (Inches)	12	6 inches on snow trails overlaying roads and trails 12 inches on 0.1 mile of trail not overlaying roads or trails
Minimum Snow Depth for Public, Cross-country OSV Use (Inches)	12	12
Minimum Snow Depth for Snow Trail Grooming to Occur (Inches)	18	12*
OSV Trail Grooming Season	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" (OSV Program Draft EIR, Program Years 2010-2020 – October 2010, California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, page 2-12)

Designation of Areas

Subpart A of the Travel Management Regulations defines an area as, "a discrete, specifically delineated space that is smaller, and, except for OSV use, in most cases much smaller, than a Ranger District" (36 CFR §212.1). The modified proposed action would designate areas on the Lassen National Forest where public, cross-country OSV use would be allowed when there are 12 or more inches of snow on the ground. These areas total approximately 921,130 acres (table 1).

Prohibited OSV Use

The modified proposed action would not designate (would prohibit) and continue existing prohibitions on OSV use on approximately 186,000 acres of National Forest System land and add new OSV use prohibitions on approximately 42,890 acres. These new prohibitions are listed in table 2 and would apply to areas where OSV access is difficult in the southwestern corner of the Lassen National Forest, a non-motorized corridor along the Pacific Crest Trail, an area along Deer Creek to protect anadromous fish habitat, the Blacks Mountain RNA, and areas in the immediate vicinity of trails where motorized use is prohibited near Lake Almanor and Eagle Lake.

Existing OSV prohibitions in Wilderness areas and in areas designated in the Forest Plan as Recommended Wilderness, Semi-primitive Non-motorized, and Research Natural Areas that currently have the force of law, regulation, or policy and would continue to exist.

Designation of Trails

The modified proposed action would designate 323 miles of groomed and marked but ungroomed trails under National Forest System jurisdiction on the Lassen National Forest for OSV use (table 3). This represents a reduction in the number of miles of OSV trail compared to the length of trail (miles) where OSV use is currently allowed. However, approximately 97 percent of the OSV trails in the current trail system would be either designated for public OSV use or are located in areas that would be designated for public, cross-country OSV use in this alternative.

The modified proposed action would include a primarily non-motorized corridor along both sides of the Pacific Crest Trail. This corridor would be of various widths, based on the recreational opportunity spectrum (ROS) classification of the National Forest System land in the area adjacent to the Pacific Crest Trail (table 7).

Table 7. Pacific Crest Trail Corridor widths based on ROS classification

ROS Classification	Pacific Trail Corridor Width
Primitive	½ mile each side of trail centerline
Semi-primitive Non-Motorized	½ mile each side of trail centerline
Semi-primitive Motorized	¼ mile each side of trail centerline
Roaded Natural	500 feet each side of trail centerline

The modified proposed action would designate 28 points on the Pacific Crest Trail where OSVs would be allowed to cross the Pacific Crest Trail (table 4). The modified proposed action would also designate 26 trails through the non-motorized Pacific Crest Trail corridor so these crossing points can be accessed by OSVs. OSV use would be restricted to the trail, only, on these 26 crossing trails.

Two crossings would be designated on National Forest System roads that are located on non-Federal land. Although these two crossing would be designated, they would not be located within the Pacific Crest Trail corridor under National Forest System jurisdiction. Therefore, only the Pacific Crest Trail OSV crossing points are designated under the modified proposed action for these two crossings.

OSV Use on Groomed Trails

The modified proposed action would identify 349 miles of National Forest System snow trails that would be groomed for public OSV use on the Lassen National Forest (figure 2). Although identified for grooming and historically groomed by the Forest Service, approximately 38 miles of groomed trails would not be subject to designation because they are not under National Forest System jurisdiction on the Lassen National Forest. This would represent no change from current management.

Table 5 compares the number of miles of groomed snow trails that have historically been groomed (current management) with the length of snow trails (miles) under the modified proposed action that are identified to be groomed. When 6 or more inches of snow cover these trails they would be open to public OSV use. Snow trail grooming for public OSV use would occur on all of these trails only when 12 or more inches of snow cover the ground.

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. The total hours of snow trail grooming that would occur at each trail system for an average season are shown in table 8.

Table 8. Summary of grooming operations on the Lassen National Forest

Grooming Location	Annual Groomed Miles	Annual Snowcat Hours	Max Day Hours
Ashpan	1,743	249	12
Bogard and Fredonyer	5,076	680	12
Jonesville	2,222	420	25
Morgan Summit	900	300	12
Swain Mountain	660	94	12

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 (table 8).

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:

- Operators shall be trained and directed by a grooming coordinator.
- Identify hazards in advance of grooming, preferably in autumn before snow falls.
- Typical grooming season is from December to March. Maintain a 10-foot vertical clearance from potential obstructions.
- Limit grooming speeds to between 3 to 7 miles per hour.
- Groom trails to a minimum of 10 feet wide with a typical width of 10 to 14 feet.

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.

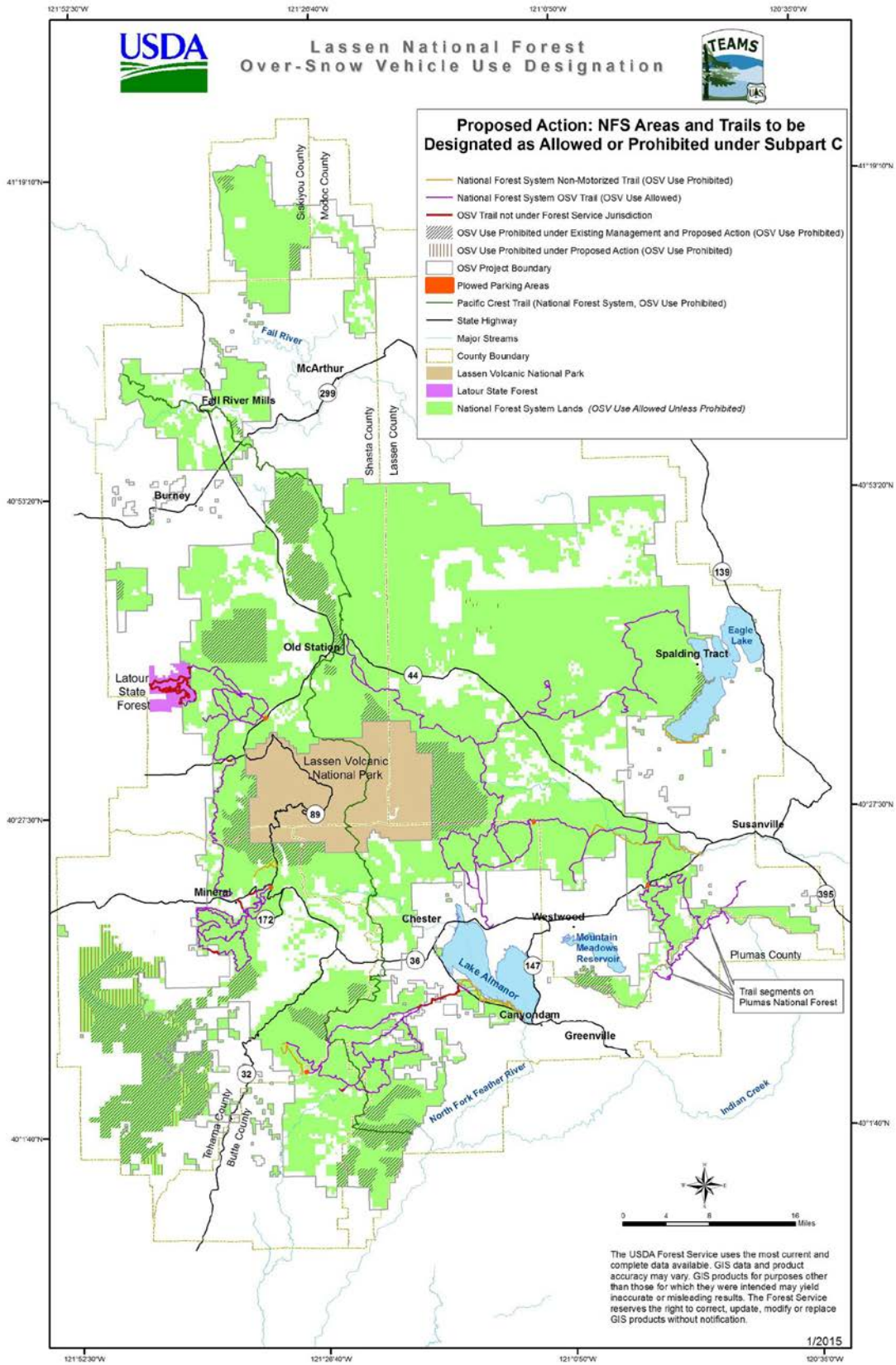

Figure 1. Map of proposed action – 36 CFR 212 Subpart C Designations

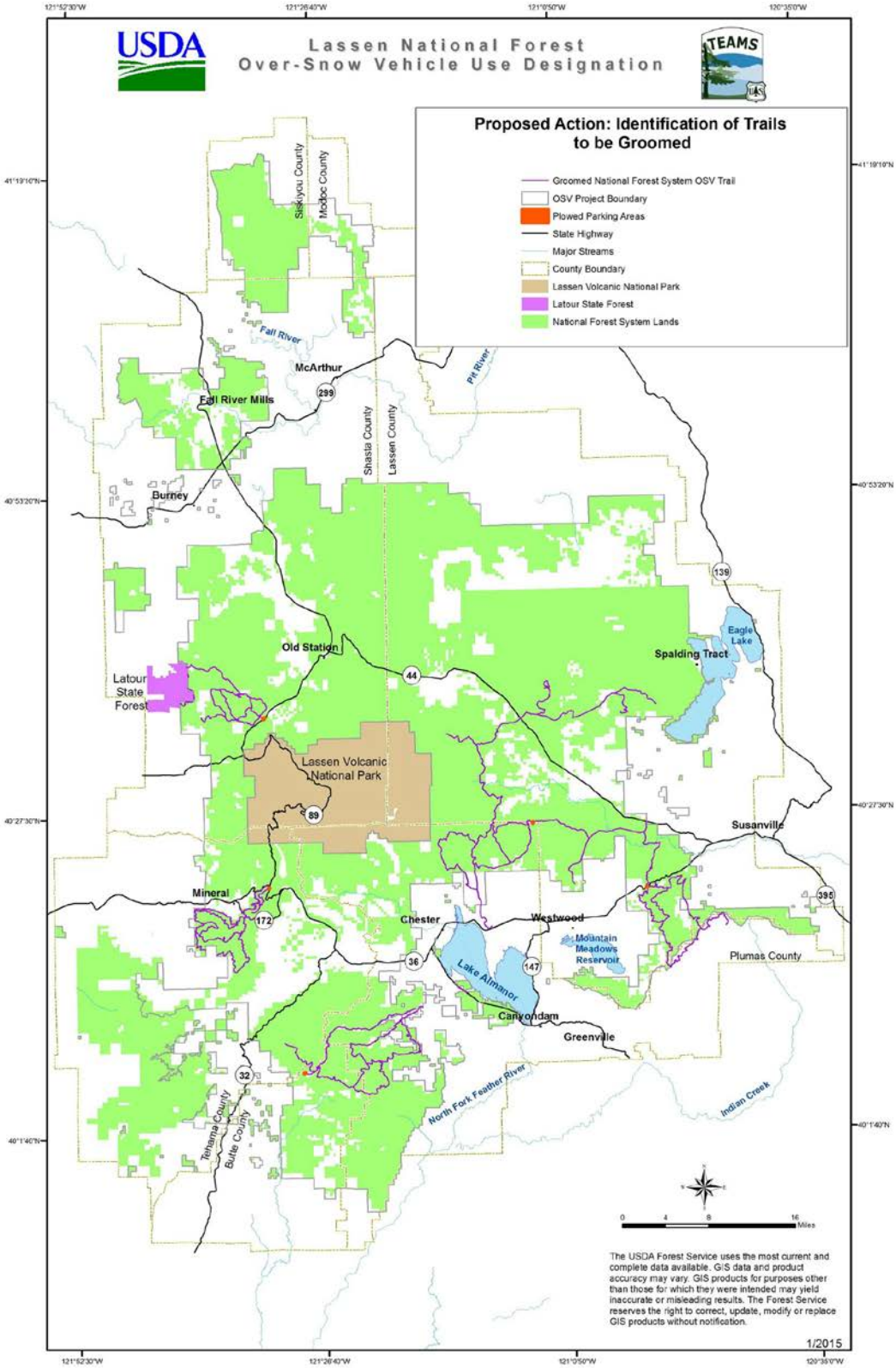

Figure 2. Map of proposed action – groomed OSV trails

Project Design Features

Minimizing Harassment of Wildlife and Significant Disruption of Wildlife Habitats (36 CFR §212.55(b)(2))

Minimizing Harassment of Wildlife

All Public OSV Use:

1. The objective of minimizing harassment of wildlife would be addressed by developing a public outreach program as part of this project to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funds allow.

Public, Cross-country OSV Use:

1. The objective of minimizing impacts to wildlife would be addressed by ensuring that public OSV use is not occurring in areas not designated for public, cross-country OSV use.

Minimizing Significant Disruption of Wildlife Habitats

Groomed Snow Trails:

1. To address the objective of minimizing significant disruption of wildlife habitats, 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, withstand expected flood flows, and allow for free movement of resident aquatic life.

Public, Cross-country OSV Use:

1. The objective of minimizing impacts to wildlife would be addressed by ensuring that public OSV use is not damaging sensitive resource locations, in consultation with forest biologists. In particular, we will monitor public OSV use in sensitive wildlife habitats, in consultation with the forest biologist, to determine if adverse impacts re occurring. If adverse impacts are observed, changes in management would be considered in consultation with the forest biologist.
2. To address the objective of minimizing significant disruption of wildlife habitats, if public OSV use is found to be causing damage to Threatened, Endangered, Proposed, or Sensitive species or habitats, corrective actions would be required, including, but not limited to, area closures and signage to protect the sensitive resources.
3. To address the objective of minimizing impacts to gray wolf and their prey species, public OSV use would not be designated on approximately 50 percent of mule deer winter range under all alternatives.
4. To address the objective of minimizing significant disruption of wildlife habitats, the low risk of modification of the prey/food base from oil, gas, or other vehicle fluids entering waterways, cross-country OSV use would occur only when there is adequate snow cover to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality.
5. The objective of minimizing impacts to aquatic habitats would be addressed by prohibiting public OSV use on unfrozen lakes, reservoirs, ponds and any other open surface water.
6. In alternative 2 only, the objective of minimizing impacts to wildlife would be addressed by not designating areas around the west side of Eagle Lake for OSV use. There are osprey and eagle

nests in that area. Under alternative 2 only, Eagle Lake would be completely buffered on National Forest System lands from OSV use.

Monitoring to Minimize Significant Disruption of Wildlife Habitats:

1. The objective of minimizing harassment of wildlife would 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.

2. To address the objective of minimizing 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 would be considered in consultation with the forest biologist.

Affected Environment and Environmental Consequences

Northern Spotted Owl

Species Account

On the Lassen, Northern Spotted Owls 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 9 shows observation data for Northern Spotted Owl on the Lassen NF. Northern spotted owls have been observed as single individuals until 2009. No reproduction has been observed. Observations have occurred over multiple years at three sites with close proximity to each other: Screwdriver Creek, Poison Creek and Underground Creek. These three 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 in the vicinity of this pair.

Table 9. Northern Spotted Owl Observations and status on the Lassen NF

Year	Number of	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 cross	No	No	No

Habitat Status

Approximately 26,240 acres of lands administered by the LNF occur within the range of the NSO. Query of existing vegetation information shows that about 13,432 acres currently consist of stands suitable for nesting, roosting, and foraging (CWHR size class 4M, 4D, 5M, 5D).

Designated Critical Habitat

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 FWS. 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).

Northern spotted owl critical habitat was originally designated in 1992, was revised in 2008, and most recently revised in 2012 (USDI Fish and Wildlife Service 2012a). Approximately 2,736 acres of designated critical habitat within the Interior California Coast, Subunit 8 (ICC-8) overlap lands administered by the LNF in the northwestern portion of the Hat Creek Ranger District and includes areas of Late Successional Reserve (LSR; 236 ac). 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 (Appendix B, map BA-1).

Environmental Consequences (Proposed Action/Preferred Alternative)

Forsman et al. (1984) indicate that NSO 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 2012a). The OSV 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. Inspections conducted of the Lassen NF snow parks on April 17 and May 1, 2010 indicated that OSV user activity extends beyond the March 31 termination date closing roads for exclusive OSV use. OSV use was assumed to be very low (< 10 riders per site/ per day on a weekend), varying 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 routes. For purposes of analysis, April 30 is used as a cut-off date for the maximum period of interaction (California Department of Parks and Recreation 2010).

Direct and Indirect Effects

NSO observation points and activity centers in Table 9 reflect a cumulative count of both observations and known nest sites over time for survey efforts since 1982. Under the proposed action there are no groomed routes, designated ungroomed routes, or plowed parking areas within ¼ mile of known NSO activity or past observations. The nearest such feature consists of a groomed route located approximately 17 miles from the NSO range delineation for lands administered by the LNF. Therefore, there would be no effect to NSO resulting from groomed routes, designated ungroomed routes, trail maintenance (including removal of obstacles such as down trees) or plowed parking activities.

Areas within NSO range are; however, open to use of existing routes (roads and trails) as well as open to 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 NSO 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 NSO locations vary in proximity to roads, with several observations occurring adjacent to existing roads designated as open to 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 FS 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 NSO 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 on a NSO 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 ft.) away and sound levels were less than 76 owl-weighted decibels (dBO) (Delaney and Grubb 2003). Noise levels of over-snow vehicles (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 through the analysis of fecal corticosterone (e.g., Wasser et al. 1997, Tempel and Gutierrez 2003, Tempel and Gutierrez 2004) and fecal glucocorticoid (Hayward et al. 2011). There is difficulty in the ability 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. 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. The 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).

A total of 13,432 acres of NSO suitable habitat occurs within the analysis area (Table 10). Of this, approximately 11,397 (85%) would be open to OSV use under the proposed action (Appendix B, map BA-1). However, 43% (5,798 acres) that is foraging habitat would be open to and conducive to (less than 70% canopy closure and less than 21% slope) to OSV use; less than 1% of the available nesting/roosting habitat would be open to and conducive to OSV use.

Table 10. Acres of suitable northern spotted owl habitat with potential to be impacted by OSV use and related activities

	Nesting/Roosting Habitat	Foraging Habitat
Open to OSV use	704 (5%)	11,397 (85%)
Closed to OSV use	46 (<1%)	1,285 (10%)
Total (13,432 acres)	750 (6%)	12,682 (94%)
Open to OSV use and Conducive to OSV use	44 (<1%)	5,798 (43%)
Closed to OSV use and Conducive to OSV use	6 (<1%)	460 (3%)
Total Conducive to OSV Use (6,308 acres)	50 (<1%)	6,258 (47%)

When considering the single northern spotted owl activity center within the analysis area, the entire activity center buffered by 0.7 miles would be open to OSV use under the proposed action. However, none of that open area is conducive to OSV (table 11; Appendix B, map BA-2).

Table 11. Acres of known northern spotted owl activity centers, buffered by 0.70 miles, with potential to be impacted by OSV use and related activities

	Acres of known northern spotted owl activity centers
Open to OSV use	642
Closed to OSV use	0
Total	642
Open to OSV use and Conducive to OSV use	2
Closed to OSV use and Conducive to OSV use	0
Total Conducive to OSV Use	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 NSO 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 NSO suitable is not in proximity to infrastructure that may facilitate OSV use of the area, including snowparks, and parking lots, as well as designated ungroomed and groomed trails. Therefore, OSV use in NSO habitats is expected to be low.

The proposed action does not propose to alter vegetation; therefore, would not remove, downgrade, or degrade habitat for the northern spotted owl. Northern spotted owl foraging behavior or their ability to locate prey is not expected to be significantly impacted by snowmobile use. 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/trail and because material removed from the trails for safety that could provide cover will be left on site. As stated previously, there is low potential for cross-country OSV travel in dense stands utilized by NSO and their prey. Prey may be temporarily startled by noise as a snowmobile passes by; however, the overall abundance and availability of prey will not change as a result of the proposed action.

Direct and Indirect Effects - Critical Habitat

Designated critical habitat for the northern spotted owl does occur within the action area; however, the primary constituent elements of the physical and biological features that are essential to the recovery of the species will not be affected by the proposed action (USDI Fish and Wildlife Service 2012). Similarly, the proposed action will not impede the recovery of the species, as it is not contrary to stated recovery criteria or recovery actions (USDI Fish and Wildlife Service 2011).

Cumulative Effects

Under the ESA, cumulative effects include "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 CFR 402.02). It should be noted that the definition of cumulative effects under ESA is different from cumulative effects as interpreted under the National Environmental Policy Act and the two should not be confounded or confused.

In accordance with the Council of Environmental Quality (2005), past actions and their effects are reflected in the existing condition and baseline habitat because those conditions reflect the aggregate impact of all prior human actions and natural events that have resulted in the current environmental conditions and might contribute to cumulative effects.

Non-federal lands, predominately private lands under various ownerships and a small amount of State-owned land, are interspersed with FS lands within the portion of the LNF administrative boundary overlapping the distribution of northern spotted owl. Review of satellite imagery indicates past or ongoing activities on these lands that include timber harvest, mining, and agriculture, as well as road and powerline occurrence. It is reasonable to assume that these activities would continue to occur on non-federal lands, although the extent and timing of timber harvest is not known. Timber harvest that coincides with suitable or dispersal habitat on non-federal lands may impact habitat availability and increase disturbance locally.

There are no cumulative effects to critical habitat because there are no activities proposed within critical habitat under the proposed action (or any alternative) that would modify its function, and critical habitat is not designated on private lands within the Action Area.

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 because suitable and dispersal habitat function will not be removed under the federal action.

Determinations – Northern Spotted Owl

Based on the above discussions, it is my determination that the proposed action/preferred alternative **may affect, but is not likely to adversely affect** the northern spotted owl, based on the following rationale:

- Although there is the potential for noise-based disturbance to NSO within roughly 43% of suitable NSO habitat that is foraging habitat, the percentage of suitable habitat impacted would actually be lower considering that the concentration of OSV use is not equal across the landscape. NSO habitats are not near infrastructure, including snowparks, and parking lots, as well as designated ungroomed and groomed trails, that may facilitate OSV use of the area. Although the whole of the single activity center within the analysis area is open to OSV use, none of it is conducive to OSV use Therefore, OSV use in NSO habitats is expected to be low.
- The OSV proposed actions will not modify any suitable (nesting, roosting or foraging), dispersal, or capable habitat within the OSV area.

- The level of noise disturbance by OSVs and non-OSVs has occurred over the past 30 or more years and potentially resulting in some level of acclimation by species.
- The noise would be intermittent and of short duration within and in proximity to unsurveyed suitable habitat, and would occur within the early part of the breeding season.
- OSV use is unlikely to influence NSO foraging or prey availability.

Determinations - NSO Critical Habitat

It is my determination that there will be **no effect** to northern spotted owl designated critical habitat from the proposed action/preferred alternative based on the following rationale:

- Designated critical habitat for the northern spotted owl does occur within the action area.
- Primary constituent elements of the physical and biological features that are essential to the recovery of the species will not be affected by the proposed action.
- The proposed action will not impede the recovery of the species, as it is not contrary to stated recovery criteria or recovery actions.

Gray Wolf

Species Account

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 >1.0 mi/mi^2 (Witmer et al. 1998).

Dens are usually located on moderately steep slopes with southerly aspects within close proximity to 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 75-150 mi^2, and home range size and location is determined primarily by abundance of prey. Wolves feed largely on ungulates and beavers, but will consume small mammals and fish to a lesser extent (Verts and Carraway 1998). 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.

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 this BA to predict whether OR7 will 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 deployed in the vicinity took multiple photos showing two adults, and five pups (CDFW 2015c). This group has been designated as the Shasta Pack by CDFW. Because a portion of the LNF lies within Siskiyou County and the pack's location has not been specified, it is possible that gray wolves could occur within the project at any given time in the future. There are currently no known dens or rendezvous sites within the project area.

Habitat Status

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 (Paquet and Carbyn 2003, 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 south southern portions of the Almanor Ranger District.

Environmental Consequences

Common Effects of Travel Management

Effects to gray wolves is described in terms of those parameters that threaten wolves through human contact and conflict (i.e., livestock/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, a lack of understanding of wolf ecology and habits, and the 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 are used in different years by wolves (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 used by wolves during the summer and early fall. Several rendezvous sites are used with the first one generally located between 1 – 6 miles from the natal den. Rendezvous sites are used by a pack 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).

Prey Base

Wolves primarily prey on ungulates (USDI Fish and Wildlife Service1987). 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 planning area. Due to seasonal overlap between the proposed activities (over snow vehicle use) and potential effects to wolf prey base, impacts considered in this analysis are confined primarily to mule deer occurrence on winter range.

Direct and Indirect Effects – Proposed Action/Preferred Alternative

There are no effects to den or rendezvous sites since these sites are not present in the project area, No impacts to structure and composition of habitats would occur under any alternative. Due to proximity to 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 existing potential for direct effects as a result of injury or mortality due to vehicle collisions is very low.

Incidental disturbance of individual wolves from OSV use of established routes 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 (NPS 1996 cited in Olliff 1999) have shown that wolves tended 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 received higher levels of human presence (Olliff et al. 1999, Whittington et al. 2005).

OSV use of groomed routes 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 (406-408 miles); therefore the effect of groomed trails is similar. Existing linear routes (i.e. roads and trails) in areas outside groomed routes open to OSV travel (including existing roads, trails) are expected to receive less human use resulting in a decreased degree of disturbance and potential displacement of wolves. Areas outside of existing linear routes and open to cross-country 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 routes may attract more use.

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 in NPS 2007).

No groomed or ungroomed designated OSV routes occur within mule deer winter range under any alternative. However, OSV use of existing linear routes and cross-country travel is allowed within winter range at some level. Approximately 119,757 acres of mule deer winter range occurs within the analysis area (Table 12; Appendix B, map BA-3). OSV use would be restricted on approximately 74,719 acres (62%) of winter range under the proposed action due to restrictions in the southwestern portion of the LNF below 3,500 feet elevation. Therefore, under the proposed action, mule deer would have the potential to be subject to disturbance, mortality, injury, or altered movement from low to no OSV use across approximately 38% of their winter range.

Table 12. OSV Area Restrictions under the Proposed Action

OSV Management	Acres
Total Winter Range	119,757
Winter Range Restricted (Designated)	74,719
Approximate Area OSV Restricted within Mule Deer Winter Range (%)	74,719 (62%)

Summary of Effects

Under the proposed action, OSV use has the potential to cause disturbance and potential temporary displacement to wolves during the winter season. 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. Because the proposed action excludes OSV use at elevations below 3,500 feet within deer winter range in the southwestern portion of the LNF, potential impacts to winter prey availability due to disturbance are reduced compared to the existing condition.

Cumulative Effects

Non-federal lands, predominately private lands under various ownerships as well as State-owned lands, are interspersed with FS lands within the analysis area. Review of satellite imagery indicates past or ongoing activities on these lands that include timber harvest, mining, and agriculture, as well as road and powerline occurrence and potential livestock grazing. It is reasonable to assume that these activities would continue to occur on non-federal lands, although the extent and timing of timber harvest is not known. All ongoing or foreseeable activities are likely to increase disturbance to wolves to some degree locally. There is also a low potential for wolf injury or mortality due to vehicle collisions as well as conflicts with livestock grazing.

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 because habitat function and increased vulnerability to mortality will not be altered under the federal action.

Determination

The proposed action would have a low level of risk to wolves. Therefore, it is my determination that the proposed action/preferred alternative **may affect, but is not likely to adversely affect** gray wolves based on the following rationale:

- There are currently no known established wolf packs within the project area.
- There are no known denning or rendezvous sites within the project area.
- The noise would be intermittent and of short duration within habitats suitable for wolves.
- Potential for direct impacts to wolves due to collisions with OSVs is low.
- Wolves are less likely to occur within most of the project area from December through April due to seasonal elevation shifts of prey species.
- Approximately 62% of mule deer winter range would be restricted from OSV use under the proposed action.

Wolverine

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 (USFWS 2013). Although incidental, unconfirmed sightings of wolverine have been reported throughout the Sierra Nevada, including Lassen National Forest (Lassen National Forest 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 (USFWS 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 (USFWS 2013).

Along the Pacific Coast, historical records show that wolverines occurred in two population centers in the North Cascades Range and the Sierra Nevada (USFWS 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 (USFWS 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 (USFWS 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, USFWS 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 (USFWS 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 (USFWS 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 (USFWS 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 (Lassen National Forest 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 (Appendix B, map BA-4).

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 USFWS (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 USFWS (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.

Environmental Consequences

Direct and Indirect Effects – Proposed Action/Preferred Alternative

California wolverine are considered sensitive to the presence of humans and human activities. The most common interactions between snowmobile routes 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 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 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 (USFWS 2013), there are no verified detections of wolverine within one-quarter mile of snowmobile routes 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 miles of OSV trails and staging areas receive the highest use and no new trails are proposed under any of the alternatives.

Table 13 shows the amount and percentage 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 under the proposed action. Eighty percent of suitable wolverine habitat would be open to OSV use, but 56% would be open to and conducive to OSV use (map BA-4). 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% of suitable habitat. In addition, of that 56% 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% of wolverine habitat.

Table 13. Acres of wolverine habitat with potential to be impacted by OSV use and related activities

	Acres of wolverine habitat
Open to OSV use	32,404 (80%)
Closed to OSV use	7,872 (20%)
Total	40,276 (100%)
Open to OSV use and Conducive to OSV use	22,572 (56%)
Closed to OSV use and Conducive to OSV use	5,419 (13%)
Total Conducive to OSV Use	27,991 (69%)

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. In addition, the objective of minimizing impacts to wildlife during the winter would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

Cumulative Effects

Non-federal lands, predominately private lands under various ownerships as well as State-owned lands, are interspersed with FS lands within the analysis area. Review of satellite imagery indicates past or ongoing activities on these lands that include timber harvest, mining, and agriculture, as well as road and powerline occurrence and potential livestock grazing. It is reasonable to assume that these activities would continue to occur on non-federal lands, although the extent and timing of timber harvest is not known. Noise-based disturbance from the proposed action, in combination with that of ongoing and reasonably foreseeable actions within the analysis area, could increase disturbance to wolverine, should they be present, to some degree locally. However, it would likely be incrementally small due to the highly nocturnal nature of wolverines.

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 because habitat function and increased vulnerability to mortality will not be altered under the federal action.

Determination

The Lassen National Forest Over-snow Vehicle Use Designation Project may affect, but is not likely to adversely affect 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 would be 56% of suitable habitat under the proposed action, 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.
- In addition, the objective of minimizing impacts to wildlife would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

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Appendix A

The U.S. Fish and Wildlife Service (FWS) list of Threatened, Endangered, and Proposed wildlife species for the Lassen National Forest was obtained through the FWS Information for Planning and Conservation website (https://ecos.fws.gov/ipac/) from the Klamath Falls, Sacramento, Yreka, and Nevada Fish and Wildlife Service offices, dated March 9, 2016. A compilation of those species and critical habitats identified for consideration in the effects analysis, as provided by four FWS offices (Klamath Falls, Nevada, Sacramento, and Yreka), are shown in the following table. Listed aquatic species as well as plants are addressed in separate Biological Assessment and Evaluation documents under this project.

Species list

Species	Status	Has Critical Habitat	Condition(s)	FWS Office[3]
Amphibians				
California red-legged frog *(Rana draytonii)* Population: Entire	Threatened	Final designated		Klamath Falls, Sacramento, Yreka
Oregon Spotted frog *(Rana pretiosa)*	Threatened	Proposed		Yreka
Sierra Nevada Yellow-legged Frog *(Rana sierrae)*	Endangered	Proposed		Sacramento
Birds				
Northern Spotted owl *(Strix occidentalis caurina)* Population: Entire	Threatened	Final designated		Sacramento, Yreka
Yellow-Billed Cuckoo *(Coccyzus americanus)* Population: Western U.S. DPS	Threatened	Proposed		Klamath Falls, Yreka
Conifers and Cycads				
Whitebark pine *(Pinus albicaulis)*	Candidate			Klamath Falls, Sacramento
Crustaceans				
Conservancy fairy shrimp *(Branchinecta conservatio)* Population: Entire	Endangered	Final designated		Sacramento, Yreka
Shasta crayfish *(Pacifastacus fortis)* Population: Entire	Endangered			Klamath Falls, Sacramento, Yreka
Vernal Pool fairy shrimp *(Branchinecta lynchi)* Population: Entire	Threatened	Final designated		Sacramento, Yreka
Vernal Pool tadpole shrimp *(Lepidurus packardi)* Population: Entire	Endangered	Final designated		Sacramento, Yreka

[3] No listed species or critical habitats were identified in the official list from the Nevada Fish and Wildlife Office

Species	Status	Has Critical Habitat	Condition(s)	FWS Office[3]
Fishes				
Coho salmon *(Oncorhynchus (=salmo) kisutch)* Population: Southern Oregon – Northern California Coast ESU	Threatened			Klamath Falls, Sacramento
Delta smelt *(Hypomesus transpacificus)* Population: Entire	Threatened	Final designated		Sacramento, Yreka
Longfin smelt *(Spirinchus thaleichthys)*	Candidate			Yreka
Steelhead *(Oncorhynchus (=salmo) mykiss)* Population: Northern California DPS	Threatened	Final designated		Sacramento
Flowering Plants				
Butte County meadowfoam *(Limnanthes floccosa ssp. californica)*	Endangered	Final designated		Sacramento
Gentner's Fritillary *(Fritillaria gentneri)*	Endangered			Yreka
Greene's tuctoria *(Tuctoria greenei)*	Endangered	Final designated		Klamath Falls, Sacramento
Hoover's spurge *(Chamaesyce hooveri)*	Threatened	Final designated		Yreka
Slender Orcutt grass *(Orcuttia tenuis)*	Threatened	Final designated		Klamath Falls, Sacramento, Yreka
Insects				
Valley Elderberry Longhorn beetle *(Desmocerus californicus dimorphus)* Population: Entire	Threatened	Final designated		Sacramento, Yreka
Mammals				
Fisher *(Martes pennanti)* Population: West coast DPS	Proposed Threatened			Klamath Falls, Yreka
Gray wolf *(Canis lupus)* Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico.	Endangered			Klamath Falls, Sacramento, Yreka

Species	Status	Has Critical Habitat	Condition(s)	FWS Office[3]
Reptiles				
Giant Garter snake *(Thamnophis gigas)* Population: Entire	Threatened			Sacramento

Critical habitats

The following critical habitats lie fully or partially within the project area.

Species	Critical Habitat Type	FWS Office
Amphibians		
Sierra Nevada Yellow-legged Frog *(Rana sierrae)*	Proposed	Sacramento
Birds		
Northern Spotted owl *(Strix occidentalis caurina)* Population: Entire	Final designated	Sacramento, Yreka
Flowering Plants		
Greene's tuctoria *(Tuctoria greenei)*	Final designated	Klamath Falls, Sacramento
Slender Orcutt grass *(Orcuttia tenuis)*	Final designated	Klamath Falls, Sacramento, Yreka

Appendix B: Maps

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Appendix G. Biological Evaluation

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Introduction

This Biological Evaluation (BE) 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 tables 1 and 2. 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.

Consultation to Date

We obtained official species lists for the Lassen National Forest Over-snow Vehicle Use Designation Project on March 9, 2016, 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 2016b, 2016c, 2016d, 2016e). The lists identify wildlife species to consider, because they may be present within the general area of the Lassen National Forest. Since that time, wolverine has been proposed as threatened throughout its range, although it has not been officially announced in the federal register as of July 22, 2016. A letter of concurrence was sent to the Service on XX.

Table 1. Terrestrial threatened, endangered, proposed, and candidate (TEPC) species and designated or proposed critical habitat considered within this analysis

Species Name	TEPC Status[4]	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*), Southern Cascades 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

[4] 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 March 9, 2016, 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, June 30, 2013.

Species Name	TEPC Status[4]	Project Area Within Species' Range	Detections in or Near the Project Area	Suitable Habitat Present	Species Addressed Further/Rationale
Northern spotted owl designated critical habitat	NA	NA	NA	NA	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
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 2. Terrestrial Forest Service Sensitive Species considered within 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

Species Name	Project Area Within Species' Range	Detections in or Near the Project Area	Suitable Habitat Present	Species Addressed Further/Rationale
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

Action Area and Alternatives

Refer to the FEIS for additional information.

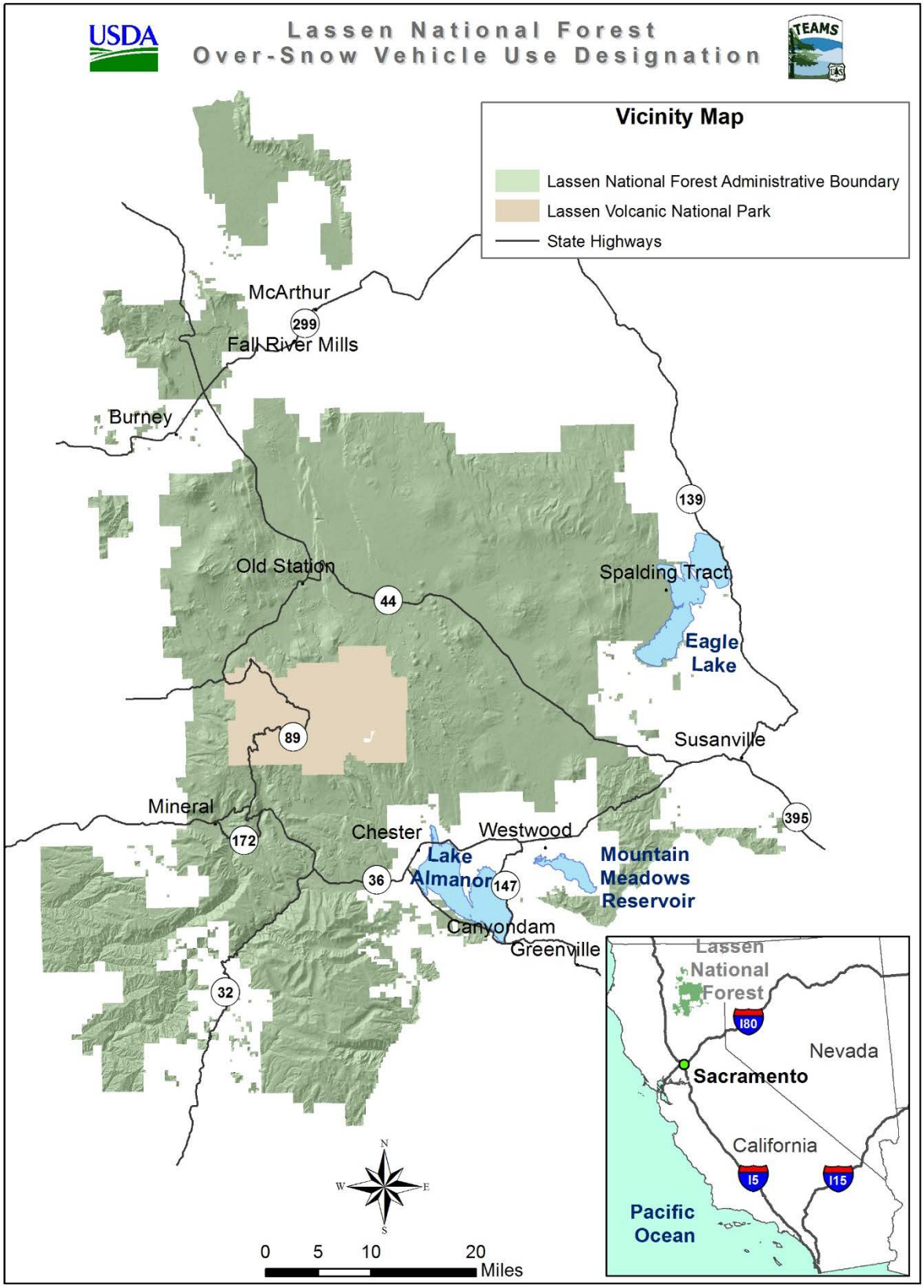

Figure 1. Vicinity Map

Table 1. Comparison of areas where OSV use would be allowed with total forest land area, by alternative

Area	Alternative 1 - Current Management*	Alternative 2 – OSV Designations	Alternative 3 – OSV Designations	Alternative 3 – OSV Designations
National Forest System Land Area within Administrative Boundary of Lassen National Forest (Acres)	1,150,020	1,150,020	1,150,020	1,150,020
Total Areas Open (Designated in Alternatives 2 - 4) for Cross-country OSV Use (Acres)	964,020	921,130	834,660	958,930
Percentage of NFS Land Area Open (Designated in Alternatives 2 - 4) for Cross-country OSV Use	83.8%	80.1%	72.6%	83.4%
Total Areas OSVs Not Allowed and Not Designated for OSV Use (Acres) (table 5)	186,000	228,890	315,360	191,090

*Because no Subpart C designations of areas and trails for OSV use have been made, areas and trails are not “designated,” but are either “open” or “closed” to OSV use under current management.

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Table 4. Areas not designated for OSV use, by alternative (acres)

Area	Alternative 1 - Current Management	Alternative 2 – OSV Use Not Designated	Alternative 3 – OSV Use Not Designated	Alternative 4 – OSV Use Not Designated
• Ishi Wilderness	40,910	40,910	40,910	40,910
• Caribou Wilderness	20,830	20,830	20,830	20,830
• Thousand Lakes Wilderness	16,570	16,570	16,570	16,570
• Proposed Wilderness Adjacent to SW Corner LVNP (Rocky Peak)	8,620	8,620	8,620	8,620
• Proposed Wilderness Southwest Corner of Forest	7,710	7,710	7,710	7,710
• Proposed Wilderness South Border of LVNP (Chummy Meadows)	4,890	4,890	4,890	4,890
• Proposed Wilderness East Side of Caribou Wilderness	890	890	890	890
• Pacific Crest Trail and Non-motorized Corridor	-	10,460	-	-
• Cub Creek RNA	4,090	4,090	4,090	4,090
• Blacks Mountain RNA	-	520	520	520

Area	Alternative 1 - Current Management	Alternative 2 – OSV Use Not Designated	Alternative 3 – OSV Use Not Designated	Alternative 4 – OSV Use Not Designated
• Semi-primitive Non-motorized and Primitive Near Ishi Wilderness	22,320	22,320	22,320	22,320
• Semi-primitive Non-motorized Near Old Station and East of Hwy. 89 (Cinder Butte)	13,700	13,700	13,700	13,700
• Semi-primitive Non-motorized Chips Creek Area	7,400	7,400	7,400	7,400
• Semi-primitive Non-motorized Soda Creek Area	4,210	4,210	4,210	4,210
• Semi-primitive Non-motorized South of Mountain Meadows Reservoir Including Homer Deer SIA	3,370	3,370	3,370	3,370
• Semi-primitive Non-motorized Snow Meadow Area	3,140	3,140	3,140	3,140
• Semi-primitive Non-motorized North of LVNP (East of West Prospect Peak)	2,610	2,610	2,610	2,610
• Semi-primitive Non-motorized Jackass Creek Area	1,800	1,800	1,800	1,800
• Semi-primitive Non-motorized Rock Creek Area	1,760	1,760	1,760	1,760
• Semi-primitive Non-motorized (East of Adobe Flat Reservoir - Shasta Trinity NF Managed by Lassen NF)	1,750	1,750	1,750	1,750
• Semi-primitive Non-motorized (West of Mayfield Ice Cave - Shasta Trinity NF Managed by Lassen NF)	1,070	1,070	1,070	1,070
• Semi-primitive Non-motorized Snow Mountain Area West of Old Station	700	700	700	700
• Semi-primitive Motorized Near Old Station East of Hwy. 89 (Hat Creek Valley)	12,110	12,110	12,110	12,110
• Semi-primitive Motorized Butt Mountain Area	1,660	1,660	1,660	1,660
• Semi-primitive Motorized SE of Old Station East of Hwy. 44 (Little Potato Butte)	630	630	630	630
• Roaded Natural Onion Springs Closure (West Border of LVNP)	1,080	1,080	1,080	1,080
• West Shore of Eagle Lake South of Spalding Tract Osprey Mgt Area	1,670	1,670	1,670	1,670
• Deer Creek Anadromous Fish Closure	-	1,520	-	-
• Butte Lake Closure (OSV prohibited except where restricted to trail only) North of LVNP	-	-	31,730	-

Area	Alternative 1 - Current Management	Alternative 2 – OSV Use Not Designated	Alternative 3 – OSV Use Not Designated	Alternative 4 – OSV Use Not Designated
• Limited OSV Access in Southwest Corner of Lassen NF	-	27,400	-	-
• Below 3,500-foot Elevation on the Lassen NF	-	-	59,130	-
• Fredonyer-Goumaz Closure (OSV prohibited except where restricted to trail only) Between Hwys 36 & 44	-	-	19,040	-
• McGowen Lake Non-Motorized Area (North of Mineral, East of Rd. 17)	-	-	10,300	4,570
• Colby Mountain Closure	-	-	4,490	-
• Southwest Shore Lake Almanor	-	1,840	1,840	-
• South Shore Eagle Lake	-	1,150	1,680	-
• Tippin Forest Order North of Hwy. 299	510	510	510	510
• Willard Hill Closure	-	-	630	-
Total Areas OSVs Not Allowed and Not Designated for OSV Use in Alternatives 2 - 4 (Acres)	186,000	228,890	315,360	191,090

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Table 5. Designated groomed and ungroomed trails for OSV use (miles)

Snow Trails for OSV Use	Alternative 1 - Current Management	Alternative 2 – OSV Designations	Alternative 3 – OSV Designations	Alternative 4 – OSV Designations
Groomed and Ungroomed Snow Trails on Lassen NF for OSV Use (miles) (Includes groomed designated OSV trails in **Table**)	2,760	323	316	398
Ungroomed Snow Trails where OSV Use would be Allowed (Designated in Alternatives 2 - 4) (miles)				
• PCT OSV Crossing Access Trails (Table)	-	7	-	-
• Road 29N10	5	5	5	5
• Road 30N16 from 31N17 To McGowan OSV Closure	2	-	-	2
• Road 27N11 Ungroomed Designated SE of Jonesville	1	-	-	1
• Road (3xN17) West of McGowan Designated Ungroomed to Ashpan Groomed System	28	-	-	28
• Forest Road 21 & County Road 105 from Hwy. 44 to Eagle Lake	25	-	-	25

Snow Trails for OSV Use	Alternative 1 - Current Management	Alternative 2 – OSV Designations	Alternative 3 – OSV Designations	Alternative 4 – OSV Designations
• Designated Ungroomed North of LVNP (Butte Lake)	22	-	-	22
• Road 32N46 in Ashpan Designated Ungroomed	4	-	-	4
• Ungroomed OSV Trail in OSV Prohibited Areas	12	-	-	-
• Other Ungroomed OSV Trail in Areas Open to Cross-country OSV Use (Marked and Unmarked)	2,350*	-**	-**	-
Total Trails Open for OSV Use but not Groomed	2,449	12	5	87

*Most of these OSV trails are mapped on the Lassen National Forest's 2005 Winter Recreation Guide.

**Alternatives 2 and 3 would not designate ungroomed OSV trails located within areas designated for public, cross-country OSV use.

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Table 6. Designated Pacific Crest Trail (PCT) OSV crossings

OSV/PCT Crossing	Alternative 1 - Current Management	Alternative 2 – OSV Designations	Alternative 3 – OSV Designations	Alternative 4 – OSV Designations
Designated Pacific Crest Trail Crossing Points (#)	No PCT Crossing Points or Corridor*	28	No PCT Crossing Points or Corridor Designated*	No PCT Crossing Points or Corridor Designated*
Designated OSV Access Trails Through Designated Pacific Crest Trail Crossing Points by Road Name (miles)	-	8	-	-
• Pit River Canyon Rd (St Dr 50) – Only a crossing point designated in Alternative 2. No PCT corridor or access trail designated due to lack of NFS jurisdiction on adjacent land.	-	Designated as Crossing Point Only	-	-
• St. Bernard So Rd. (Collins 1) - Only a crossing point designated in Alternative 2. No PCT corridor or access trail designated due to lack of NFS jurisdiction on adjacent land.	-	Designated as Crossing Point Only	-	-
• 37N05 and 37N052Y - Designated Ungroomed	-	0.4	-	-
• 37N05 - Designated Ungroomed	-	0.4	-	-
• 37N5C - Designated Ungroomed	-	0.3	-	-
• 37N05 - Designated Ungroomed	-	0.2	-	-
• 37N02 - Designated Ungroomed	-	0.1	-	-
• 36N10 - Designated Ungroomed	-	0.2	-	-

OSV/PCT Crossing	Alternative 1 - Current Management	Alternative 2 – OSV Designations	Alternative 3 – OSV Designations	Alternative 4 – OSV Designations
• 36N36Y - Designated Ungroomed	-	0.2	-	-
• 36N09 - Designated Ungroomed	-	0.2	-	-
• 36N33B - Designated Ungroomed	-	0.2	-	-
• 35N10 - Designated Ungroomed	-	0.3	-	-
• 34N94 and 34N34 - Designated Ungroomed	-	0.6	-	-
• 33N22 - Designated Ungroomed	-	0.2	-	-
• 32N99 - Designated Ungroomed	-	0.2	-	-
• 32N20 - Designated Ungroomed	-	0.2	-	-
• 32N12 - Designated Ungroomed	-	0.3	-	-
• 32N92 - Designated Ungroomed	-	0.2	-	-
• 32N42Y - Designated Ungroomed, 0.095 mile not on underlying route.	-	0.3	-	-
• 29N97 and 29N27 - Designated Ungroomed	-	0.3	-	-
• 28N61 - Designated Ungroomed	-	0.8	-	-
• 28N16 - Designated Ungroomed	-	0.4	-	-
• 28N16 , 29N17, and 29N17J - Designated Ungroomed	-	0.3	-	-
• 27N11G - Designated Ungroomed	-	0.6	-	-
• 26N74 - Designated Ungroomed	-	0.2	-	-
• Humboldt Rd./28N43 - Designated Groomed Included in Jonesville Groomed Total	-	0.3	-	-
• Humbug Rd./BU915 - Designated Groomed Included in Jonesville Groomed Total	-	0.2	-	-
• 26N02/Cirby Meadows - Designated Groomed Included in Jonesville Groomed Total	-	0.3	-	-
Designated OSV Access Trails Through Designated PCT Crossing Points (#)	-	26	-	-
Designated Groomed OSV Access Trails Through Designated PCT Crossing Points - Jonesville Groomed Trail System (#)	-	3	-	-
Designated Groomed OSV Access Trails Through Designated PCT Crossing Points - Jonesville Groomed Trail System (miles)	-	1	-	-

OSV/PCT Crossing	Alternative 1 - Current Management	Alternative 2 – OSV Designations	Alternative 3 – OSV Designations	Alternative 4 – OSV Designations
Designated Ungroomed OSV Access Trails Through Designated PCT Crossing Points (#)	-	23	-	-
Designated Ungroomed OSV Access Trails Through Designated PCT Crossing Points (miles)	-	7	-	-

*In alternatives 1, 3, and 4, OSV use would be allowed adjacent to and across the PCT. Motorized use would be prohibited on the tread of the PCT in all alternatives.

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Table 7. OSV trail systems groomed by the Lassen National Forest (miles)

Groomed OSV Trail System	Alternative 1	Alternative 2	Alternative 3	Alternative 4
La Tour State Forest Snowmobile Area				
• Groomed by FS; Trail Not Under NFS Jurisdiction	20	20	20	20
• Groomed by FS Under NFS Jurisdiction (Trail to be Designated in Alternatives 2 - 4)	3	3	3	3
• Subtotal	23	23	23	23
Ashpan Snowmobile Area				
• Groomed by FS; Trail Not Under NFS Jurisdiction	-	-	-	-
• Groomed by FS Under NFS Jurisdiction (Trail to be Designated in Alternative 2)	34	34	34	34
• Subtotal	34	34	34	34
Morgan Summit Snowmobile Area				
• Groomed by FS; Trail Not Under NFS Jurisdiction	2	2	2	2
• Groomed by FS Under NFS Jurisdiction (Trail to be Designated in Alternatives 2 - 4)	60	60	60	60
• Subtotal	62	62	62	62
Jonesville Snowmobile Area				
• Groomed by FS; Trail Not Under NFS Jurisdiction	5	5	5	5
• Groomed by FS Under NFS Jurisdiction (Trail to be Designated in Alternatives 2 - 4)	64	64	64	64
• Subtotal	69	69	69	69
Swain Mountain Snowmobile Area				

Groomed OSV Trail System	Alternative 1	Alternative 2	Alternative 3	Alternative 4
• Groomed by FS; Trail Not Under NFS Jurisdiction	-	-	-	-
• Groomed by FS Under NFS Jurisdiction (Trail to be Designated in Alternatives 2 - 4)	71	71	71	71
• Subtotal	71	71	71	71
Bogard Snowmobile Area				
• Groomed by FS; Trail Not Under NFS Jurisdiction	-	-	-	-
• Groomed by FS Under NFS Jurisdiction (Trail to be Designated in Alternatives 2 - 4)	47	47	47	47
• Subtotal	47	47	47	47
Fredonyer Snowmobile Area				
• Groomed by FS; Trail Not Under NFS Jurisdiction	-	-	-	-
• Groomed Lassen NF by FS Under NFS Jurisdiction (Trail to be Designated on Plumas NF)	11	11	11	11
• Groomed by Lassen NF FS Under NFS Jurisdiction (Trail to be Designated on Lassen NF in Alternatives 2 - 4)	32	32	32	32
• Subtotal	43	43	43	43
Total OSV Use Allowed (Designated on Lassen NF in Alternatives 2 - 4) and Groomed by Lassen NF	311	311	311	311
Total OSV Use Allowed (on Plumas NF) and Groomed by Lassen NF	11	11	11	11
Total Groomed but not Under NFS Jurisdiction	27	27	27	27
Grand Total Groomed	349	349	349	349

All area size and total trail distance estimates are approximate and are rounded to the nearest 10 acres or nearest mile.

Table 2. Summary comparing current OSV management with the modified proposed action for minimum snow depth and OSV trail grooming season on the Lassen National Forest

OSV Management	Alternative 1 – Current Management	Alternative 2	Alternative 3	Alternative 4
Minimum Snow Depth for Public OSV Use on Snow Trails (Inches)	12	6 on snow trails overlaying roads and trails 12 inches on 0.1 mile of trail not overlaying roads or trails	12 inches, generally. 6 inches only where site review determines there would be no damage to underlying resources	No restriction with 6 or more inches

OSV Management	Alternative 1 – Current Management	Alternative 2	Alternative 3	Alternative 4
Minimum Snow Depth for Public, Cross-country OSV Use (Inches)	12	12	12	12
Minimum Snow Depth for Snow Trail Grooming to Occur (Inches)	18	12*	18	12
OSV Trail Grooming Season	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” (OSV Program Draft EIR, Program Years 2010-2020 – October 2010, California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, page 2-12).

Project Design Features

Minimizing Harassment of Wildlife and Significant Disruption of Wildlife Habitats (36 CFR §212.55(b)(2))

Minimizing Harassment of Wildlife

All Public OSV Use:

2. The objective of minimizing harassment of wildlife would be addressed by developing a public outreach program as part of this project to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funds allow.

Public, Cross-country OSV Use:

2. The objective of minimizing impacts to wildlife would be addressed by ensuring that public OSV use is not occurring in areas not designated for public, cross-country OSV use.

Minimizing Significant Disruption of Wildlife Habitats

Groomed Snow Trails:

2. To address the objective of minimizing significant disruption of wildlife habitats, 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, withstand expected flood flows, and allow for free movement of resident aquatic life.

Public, Cross-country OSV Use:

7. The objective of minimizing impacts to wildlife would be addressed by ensuring that public OSV use is not damaging sensitive resource locations, in consultation with forest biologists. In particular, we will monitor public OSV use in sensitive wildlife habitats, in consultation with the forest biologist, to determine if adverse impacts re occurring. If adverse impacts are observed, changes in management would be considered in consultation with the forest biologist.

8. To address the objective of minimizing significant disruption of wildlife habitats, if public OSV use is found to be causing damage to Threatened, Endangered, Proposed, or Sensitive species or habitats, corrective actions would be required, including, but not limited to, area closures and signage to protect the sensitive resources.

9. To address the objective of minimizing impacts to gray wolf and their prey species, public OSV use would not be designated on approximately 50 percent of mule deer winter range under all alternatives.

10. To address the objective of minimizing significant disruption of wildlife habitats, the low risk of modification of the prey/food base from oil, gas, or other vehicle fluids entering waterways, cross-country OSV use would occur only when there is adequate snow cover to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality.

11. The objective of minimizing impacts to aquatic habitats would be addressed by prohibiting public OSV use on unfrozen lakes, reservoirs, ponds and any other open surface water.

12. In alternative 2 only, the objective of minimizing impacts to wildlife would be addressed by not designating areas around the west side of Eagle Lake for OSV use. There are osprey and eagle

nests in that area. Under alternative 2 only, Eagle Lake would be completely buffered on National Forest System lands from OSV use.

Monitoring to Minimize Significant Disruption of Wildlife Habitats:

3. The objective of minimizing harassment of wildlife would 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. To address the objective of minimizing 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 would be considered in consultation with the forest biologist.

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 does not contain any management area direction specific to over-snow vehicles. 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 (HMAs) 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 HMAs; 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 (Forest Plan 1993): The Lassen Forest Plan, as amended by the Northwest Forest Plan (USDA Forest Service and USDI BLM 1994; as amended 2004, 2007), Herger-Feinstein Quincy Library Group Recovery Act (HFQLG ROD; USDA Forest Service 1999), and Sierra Nevada Forest Plan Amendment (USDA Forest Service PSW Region 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 protected activity centers (PACs) are delineated surrounding each territorial owl activity center detected on National Forest System 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 or 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. Any part of the area that lies on National Forest System 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 protected activity centers (PACs) are delineated surrounding all known and newly discovered breeding territories detected on National Forest System 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 National Forest System 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

Protected activity centers (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 National Forest System 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 National Forest System 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.

Forest-wide 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 mitigation measures 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[5]), 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 a limited operating period (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 protected activity center (PAC) is unknown, either apply the LOP to a ¼-mile area surrounding the PAC, or survey to determine the 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).

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

The Limited Operating Period (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 a limited operating period (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 a limited operating period (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 U.S. Fish and Wildlife Service (USFWS) 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.

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

Purpose and Need

One purpose of this project is to effectively manage OSV use on the Lassen National Forest to provide access; ensure that OSV use occurs when there is adequate snow; promote the safety of all users; enhance public enjoyment; minimize impacts to natural and cultural resources, including terrestrial wildlife; and minimize conflicts among the various uses.

Issues

The public identified several non-significant issues during scoping. Designating roads, trails and areas for OSV use and grooming trails for OSV use has the potential to 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 (table 9) resource indicators and measures were used in the analysis to measure and disclose effects to TEPCS species and other species of public interest:

Table 3. 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[6]	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

[6] 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 conducive to OSV use assumptions criteria (canopy cover less than 70%, slopes less than 21%; 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 DEIS 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 State Environmental Impact Report (EIR)). Generally, groomed routes 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).
- Ungroomed routes receive 50 percent less use than groomed routes (only 25,000 registered OSVs in California per State EIR, 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 route access points, OSV use was documented until the end of April, at which point snow levels no longer allow continued use of designated OSV routes (California Department of Parks and Recreation 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 Conducive to OSV Use (Moderate to High Use):

- Canopy cover less than 70%: 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 Not Conducive to OSV Use (Low-to-No 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 elevation
- Canopy cover greater than 70%: 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

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 conducive to 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 (DEIR and FEIR 2010)
- Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement (U.S. Forest Service 2001) and Record of Decision for Sierra Nevada Forest Plan Amendment (U.S. 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 Region 5 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 will 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 most conducive to OSV use and in high-use areas (see assumptions).

It is also unknown whether or not compacted trails resulting from snowmobile use are facilitating predator or competitor incursion into deep snow areas; if it 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 C of the FEIS 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 DEIS 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 C of the FEIS 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 1st and October 31st, annually, although grazing occurs between April 16th and May 31st on a handful of 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% of NFS lands), 1,174 acres of roadside hazard trees (8% of NFS lands), 4,480 acres of fuels treatments (30% of NFS lands), reforesting 5,645 acres (38% 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 will 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 will 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 will 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 will 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 will 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 will 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 will 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 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 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/restoration projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and ungroomed OSV routes 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 2014). 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 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 southwest 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 (USFWS 2014b) shows that lands administered by the LNF (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 for additional information). However, the minimum cross-country snow depth of 12 inches under all of the alternatives, including the existing condition, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). Due to the project area being outside the range of the species, and due to a lack of downstream effects from project activities,

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 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 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 for additional information). However, the minimum cross-country snow depth of 12 inches under all of the alternatives, including the existing condition, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016). 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 will 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. Potential 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, or the lack of suitable habitat or habitat components in the project area, 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 routes 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 routes and wildlife that Gaines et al. (2003) documented from the literature included trapping as facilitated by winter human access, disturbance-based displacement and avoidance[7], and disturbance at a specific site[8], usually wintering areas. To a lesser degree, hunting, trapping, poaching, collection, and habitat loss and fragmentation[9] were other interactions identified. Specific types of habitat modification that occurred on winter recreation routes include the effect of snow compaction[10] on the subnivean sites used by small mammals and alteration of competitor/predator communities[11]. The same types of responses would be expected off of designated routes (i.e., cross country). Other interactions facilitated by linear recreation routes in general, but not specific to OSV use include vehicle collision and physiological response[12].

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. 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.

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

Winter Range and/or Home Range Use

This type of impact could impact 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 at all. However, 29 percent of snowmobilers report some nighttime riding (California Department of Parks and Recreation 2010) and resulting human disturbance could disrupt home range use by nocturnal species. Trail grooming activities occur at night, are infrequent, and move slowly enough that grooming is not expected to have a substantial negative effect on wildlife home range. For nocturnal and crepuscular species, trail grooming and OSV use may also result in animals avoiding areas frequented by snowmobilers 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. Snowmobile 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). Whether or not 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, is unknown.

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.

Avoidance

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

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 10 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 10. 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 cross)	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 (Lassen National Forest 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 USFWS (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, USFWS 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, Carey et al. 1992, Zabel et al. 1995, White 1996, Ward et al. 1998 and Forsman et al. 2004).

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 NSO diet, while dusky-footed woodrats constitute 70.9 percent of the biomass of NSO 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 NSO and 13,432 acres of NSO 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 (USFWS 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 11.

Table 11. 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
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
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%)

Northern spotted owl is associated with late-successional forests that can be impacted by activities associated with routes. 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 direct effects to individuals or their habitat (Gaines et al. 2003): Disturbance and potential for injury or mortality to individuals from vehicle collisions.

Disturbance:

1. Displacement of populations or individual animals from a route, related to human activities.
2. Disturbance and displacement of individuals from breeding or rearing habitats.

3. 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 routes 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 northern spotted owl.

Forsman et al. (1984) indicate that NSO 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 (USFWS 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 user 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 routes. For purposes of analysis, April 30 is used as a cut-off date for the maximum period of interaction (California Department of Parks and Recreation 2010).

NSO observation points and activity centers in table 10 reflect a cumulative count of both observations and known nest sites over time for survey efforts since 1982. Under all alternatives (1, 2, 3, and 4) there are no groomed routes, designated ungroomed routes, or plowed parking areas within one-quarter mile of known NSO activity or past observations. The nearest such feature consists of a groomed route located approximately 17 miles from the NSO range delineation for lands administered by the Lassen National Forest. Therefore, there would be no effect to NSO resulting from groomed routes, designated ungroomed routes, trail maintenance (including removal of obstacles such as down trees), or plowed parking activities.

Areas within NSO range are; however, open to use of existing routes (roads and trails) as well as open to 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 NSO 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 NSO locations vary in proximity to roads, with several observations occurring adjacent to existing roads designated as open to 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 (USFWS 1998).

There is some potential for direct effects due to collisions with vehicles. However, because NSO 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 an NSO 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 NSO suitable habitat occurs within the analysis area. Of this, 13,146 acres (98%) is currently open to OSV use (table 12). However, 46% is open to and conducive (less than 70% canopy closure and less than 21% slope; see assumptions section) to OSV use (map BE-1); 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% of suitable habitat that would be open to OSV use would be conducive to OSV use (map BE-2). Under alternative 3, only 6% of suitable habitat would be open to and conducive to OSV use (map BE-3).

Table 12. 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	
	Nest/ Roost	Forage	Nest/ Roost	Forage	Nest/ Roost	Forage	Nest/ Roost	Forage
Open to OSV use	744	12,402	704	11,397	245	3,916	744	12,402
Closed to OSV use	6	280	46	1,285	505	8,766	6	280
OSV use restricted to trails	NA		NA		0	0	NA	
Total	13,432 acres (750 acres nest/roost habitat; 12,682 acres forage habitat)							

	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	Nest/ Roost	Forage	Nest/ Roost	Forage	Nest/ Roost	Forage	Nest/ Roost	Forage
Open to OSV use and conducive to OSV use	49	6,176	44	5,798	9	747	49	6,176
Closed to OSV use and conducive to OSV use	1	82	6	460	41	5,511	1	82
Conducive to OSV use and OSV use restricted to trails	NA		NA		0	0	NA	
Total	6,308 acres (50 acres nest/roost; 6,258 acres forage)							

When considering the single northern spotted owl activity center within the analysis area, the entire activity center buffered by 0.7 mile is open to OSV use. However, none of that open area is conducive to OSV use under any of the alternatives (table 13; maps, BE-5, BE-6, BE-7, and BE-8).

Table 13. 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
Open to OSV use	642	642	639	642
Closed to OSV use	0	0	3	0
Conducive to OSV use and OSV use restricted to trails	NA	NA	0	NA
Total	642			
Open to OSV use and conducive to OSV use	2	2	2	2
Closed to OSV use and conducive to OSV use	0	0	0	0
OSV use restricted to trails	NA	NA	0	NA
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 NSO 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 NSO suitable habitat is not near infrastructure that may facilitate OSV use of the area, including snowparks, and parking lots, as well as designated ungroomed and groomed trails. Therefore, OSV use in NSO habitats is expected to be low.

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 will be left on site. As stated previously, there is low potential for cross-country OSV travel in dense stands used by NSO 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 NSO habitats on lands administered by the Lassen National Forest and adjacent National Forest System lands. Both firewood cutting and Christmas tree cutting are restricted from areas with known NSO 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 NSO 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. Use of roads within NSO habitats for hunting access contributes a level of disturbance during the end of the NSO breeding season. This is incorporated into the environmental baseline for disturbance. Timber harvest and State and private lands within one-quarter mile of NSO habitats may impact habitat availability outside National Forest System lands and may increase disturbance locally. However, existing availability of suitable NSO 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 **all alternatives**, 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 percent, under alternative 3, to 43 – 46 percent under alternatives 1, 2, and 4, the percentage of habitats impacted would actually be lower considering that the concentration of OSV use is not equal across the landscape. NSO habitats are not near infrastructure, including snowparks, and parking lots, as well as designated ungroomed and groomed trails, that may facilitate OSV use of the area. Although the whole of the single activity center within the analysis area is open to OSV use, none of it is conducive to OSV use Therefore, OSV use in NSO 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 NSO 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 NSOs is very low.

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 (USFWS 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 NSO identifies the physical and biological features essential to the conservation of the NSO as forested lands that can be used for nesting, roosting, foraging, or dispersal (USFWS 2012). The primary constituent elements (PCEs) of the physical or biological features that are essential to the conservation of the NSO 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 NSO 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 this biological assessment to predict whether OR7 will 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 five pups (CDFW 2015c). The CDFW designated this group as the Shasta Pack. Because a portion of the Lassen National Forest lies within Siskiyou County, and the pack's location has not been specified, it is possible that gray wolves could occur within the project area any time in the future. There are currently no known dens or rendezvous sites within the project area.

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 (USFWS 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 14.

Table 14. 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 Sierra Nevada red fox 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 (USFWS 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 (USFWS 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 (USFWS 1987).

Prey Base

Wolves prey primarily on ungulates (USFWS 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.

There would be no effects to den or rendezvous sites, because these sites are not present in the project area. 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 existing 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 routes 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 routes 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 routes open to 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 routes and open to 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 routes may attract more use. The amount of area open to OSV travel varies by alternative. Alternative 1 is the least restrictive, prohibiting OSV use within 186,000 acres. Alternative 4 restricts travel within 191,090 acres, while the proposed action provides restrictions on 228,890 acres. Alternative 3 is the most restrictive, prohibiting OSV travel on 315,360 acres. Alternative 3 restricts travel in areas below 3,500 feet elevation that includes 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 ungroomed designated OSV routes occur within mule deer winter range under any alternative. However, OSV use of existing linear routes and cross-country travel is allowed within winter range at some level under all alternatives. 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 to OSV use under alternatives 1 and 4 (table 15; maps BE-9 and BE12, respectively). Roughly 59,453 acres (50 percent) are open, but only 19,980 acres (17%) is open to and conducive to 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 be restricted on additional winter range under both the proposed action and alternative 3 (maps BE-10 and BE-11), respectively. Therefore, 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.

Table 15. OSV area restrictions by alternative

OSV Management	Current OSV Management	Proposed Action Designations	Alternative 3 Designations	Alternative 4 Designations
Total Area (Acres)	186,000	228,890	315,360	191,090
Below 3,500 Feet in Elevation Included in Above Total (Acres)	0	0	59,130	0
OSV Use Restricted within Mule Deer Winter Range (Acres)	59,453	78,116	90,552	59,453
Open to OSV Use and Conducive to OSV Use (acres)	19,980	15,871	9,959	19,980

Summary of Effects

Public OSV use would not be designated on at least 50% of mule deer winter range under all alternatives. By comparison, alternative 3 provides the largest amount of area where OSVs would be excluded, thereby potentially producing the lowest amount of disturbance spatially. 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 3 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 ungroomed OSV routes 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, alternatives 1, 2, 3, and 4 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:

- There are no known established wolf packs within the project area.
- There are no known denning or rendezvous sites within the project area.
- 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% to 17% of winter range conducive to OSV use.
- 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 (USFWS 2013). Although incidental, unconfirmed sightings of wolverine have been reported throughout the Sierra Nevada, including Lassen National Forest (Lassen National Forest 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 (USFWS 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 (USFWS 2013).

Along the Pacific Coast, historical records show that wolverines occurred in two population centers in the North Cascades Range and the Sierra Nevada (USFWS 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 (USFWS 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 (USFWS 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, USFWS 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 (USFWS 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 (USFWS 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 (USFWS 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 (Lassen National Forest 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-13).

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 USFWS (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 USFWS (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 16.

Table 16. 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
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%)	20,841 (52%)	22,693 (56%)

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 routes and wildlife that Gaines et al. (2003) documented from the literature included trapping as facilitated by winter human access, disturbance-based displacement and avoidance,[13] and disturbance at a specific site,[14] 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

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

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 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 (USFWS 2013), there are no verified detections of wolverine within one-quarter mile of snowmobile routes 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 miles 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 17 shows the amounts and percentages 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% is open to OSV use and conducive to OSV use (map BE-13). 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% of suitable habitat. In addition, of that 56% 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% of wolverine habitat. Similarly, under alternatives 2 and 4, 56% of wolverine habitat would be open and conducive to OSV use (maps BE-14 and BE-16, respectively). Under alternative 3 52% of wolverine habitat would be open to and conducive to OSV use (map BE-15). 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. In addition, the objective of minimizing impacts to wildlife during the winter would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

Table 17. 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
Open to OSV use	32,632	32,404	29,510	32,568
Closed to OSV use	7,644	7,872	10,760	7,708
OSV use restricted to trails	NA	NA	6	NA
Total	40,276			
Open to OSV use and conducive to OSV use	22,725	22,572	20,841	22,693
Closed to OSV use and conducive to OSV use	5,266	5,419	7,145	5,298
Conducive to OSV use and OSV use restricted to trails	NA	NA	5	NA
Total	27,991			

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 or 4, 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 ungroomed OSV routes 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 National Forest System 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 National Forest System 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, and 4 of the Lassen National Forest Over-snow Vehicle Use Designation Project may affect, but are not likely to adversely affect 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 52-56% 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.
- In addition, the objective of minimizing impacts to wildlife would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

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 (USFWS 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 (USFWS 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, two recent confirmed fisher detections have been made, one in Malinda Gulch on Chalk Mountain (Shasta-Trinity National Forest) approximately 5 miles southwest of the administrative boundary and 10 miles west of Lake Britton, and the other north of Goose Mountain within the 2009 Goose Fire perimeter 2 miles southeast of the administrative boundary. 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 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).

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 18

Table 18. 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
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[15] impacted by OSV use	40,474 (26%)	43,517 (28%)	39,586 (25%)	45,452 (29%)

Fisher is associated with late-successional forests that can be impacted by activities associated with routes. 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:

1. Displacement of populations or individual animals from a route, related to human activities.
2. Disturbance and displacement of individuals from breeding or rearing habitats.
3. 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. 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.

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

In addition, Gaines et al. (2003) found an interaction that occurred on winter recreation routes 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. A study in Utah found that 90 percent of coyote movement was made within 1,150 feet of packed trails (Bunnell et al. 2006). Whether or not 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, 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 routes to fisher, but they identify increased vulnerability to trapping mortality as the single risk factor associated with winter recreation/snowmobiling routes. 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 due to grooming or from 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 (i.e., most active at sunrise and sunset). 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; Johnson 1984; 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 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 routes would affect 9,423 acres or 5.9 percent of existing high-value habitat acres (table 19), which, at 5.9 percent, is a very low human influence rating. Designated ungroomed routes under all alternatives would influence 2,160 acres (1.3 percent), which again is very low disturbance. In addition, route 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. The Lassen National Forest Land and Resource Management Plan (LRMP) has recommended a 0 - < 0.5 mi/m^2 (preferred) route densities for fisher. Therefore, all of the action alternatives would be consistent with preferred LRMP road density recommendations and improve route densities with respect to the existing condition for fisher. And because the majority of OSV use occurs on or within 0.5 miles of groomed trails and staging areas, or within meadows within 0.5 miles 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 route densities under alternatives 2, 3 and 4.

Table 19. Acres of fisher high-value suitable habitat within 200 meters of designated groomed and designated ungroomed routes

Habitat	Alt 1	Alt 2	Alt 3	Alt 4
Groomed Route	9,423	9,423	9,423	9,423
Ungroomed Route	2,160	2,160	2,160	2,160

Source: GIS query, 10/10/2015

Areas open to cross-country OSV use vary among the alternatives.

Using a suitable fisher habitat model developed by the U.S. Fish and Wildlife Service (2016f), 156,606 acres of fisher habitat occur within Lassen National Forest System lands (table 20; map BE-17). Of those, 132,677 acres (85%) of habitat are currently open to OSV use (table 20). Intersecting suitable fisher habitat with areas most conducive to OSV use (slopes less than or equal to 21% and canopy cover less than 70%) results in 40,474 acres of fisher habitat (26%) conducive to 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 26% of suitable habitat). However, of that 36% 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 actually occurs within less than that 26% of fisher habitat and the majority of areas proposed as open to OSVs are not known to currently support fishers. Under alternative 2, 28% of suitable fisher habitat would be open and conducive to OSV use (map BE-18). Similarly, 25% of suitable habitat would be open and conductive to OSV under alternative 3 (map BE-19) and 29% under alternative 4 (map BE-20). Ongoing inventory and monitoring would be used to evaluate habitat conditions and mitigation measures to retain suitable habitat would be implemented, where necessary. Similarly, as fisher den sites are found within the portion of the action area open to 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 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, and 3, and may extend through the first half of the breeding season under alternative 4.

Table 20 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
Open to OSV use	132,677	122,236	114,648	132,208
Closed to OSV use	23,929	34,370	41,954	24,398
OSV use restricted to trails	NA	NA	4	NA
Total	156,606			
Open to OSV use and conducive to OSV use	40,474	43,517	39,583	45,452
Closed to OSV use and conducive to OSV use	7,602	4,559	8,490	2,624
Conducive to OSV use and OSV use restricted to trails	NA	NA	3	NA
Total	48,076			

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

As stated above, fishers currently use only a small portion of the project area as a result of movements from the population introduced onto Sierra Pacific Industries lands. These occurrences are concentrated within a total of 8 watersheds which 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 open to OSVs (table 21). Additional restricted areas proposed under alternative 2 decrease OSV open areas to about 58 percent of the watershed area. Alternative 3 proposes the most restricted area within the watersheds, leaving 56 percent of the area open to OSVs. Alternative 4 would increase restricted area slightly (by 119 acres) in comparison to alternative 1. Additional areas, located in dense stands (≥70% canopy closure) and on steeper terrain (>20% slope) where conditions are likely to be less conducive to OSV use, would further decrease fisher exposure to potential impacts.

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 21. OSV open area within fisher concentration areas

Habitat	Alt 1	Alt 2	Alt 3	Alt 4
OSV Open Area (acres)	157,705	141,922	137,451	157,586
OSV Open Area (percent of existing)	64.3	57.9	56.0	64.3

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 ungroomed OSV routes 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 fisher habitat. In addition, seasonal limited operating periods required for fisher 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 National Forest System 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, and 4 would have a low level of risk to existing and future introduced fisher. Therefore, Alternatives 1, 2, 3, and 4 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 Forest Plan 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 25 – 29% 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 or not 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) route densities, under alternatives 2, 3, and 4, that would be consistent with LRMP preferred route 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*) and of the subspecies *sierrae* (Dawson and Cook 2012).

Females give birth in March or April (Zielinski, pers. comm.). Home ranges of Pacific martens in the Sierra Nevada average 300 to 500 ha (740 to 1235 ac) for males and 300 to 400 ha (740 to 990 ac) 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 National Forest System 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 currently no known marten dens on the Lassen National Forest. However, 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.). 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. 1994, 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 such that 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/possible dens were discovered opportunistically in 2009 and 2012, and are predominantly on the west 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 located at an elevation of approximately 6,560 feet 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 has been 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. 2008).

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 Spencer and Rustigian-Romsos (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 NF 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 that were 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 NF 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 similar distribution of marten occupancy as the summer model, but with significantly more area predicted to have high probability of occupancy (nearly four times as much suitable habitat using 50% 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 National Forest System lands within the Lassen National Forest boundary (table 23; map BE-21).

Functional habitat connectivity for martens on the Lassen NF 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% corridors model was used to assess the potential for impact to marten functional habitat connectivity. There are 187,240 acres of 25% corridors on National Forest System lands within the Lassen National Forest boundary (table 24; map BE-25).

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).

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 22.

Table 22. 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
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	29,291 (24%)	28,555 (23%)	25,999 (21%)	27,838 (23%)
Potential for loss of habitat connectivity	Acres and percentage of connectivity corridors impacted by OSV use	71,494 (38%)	70,308 (38%)	64,500 (34%)	71,039 (40%)

Marten associated with late-successional forests that can be impacted by activities associated with routes. 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 routes and wildlife that Gaines et al. (2003) documented from the literature included trapping as facilitated by winter human access, disturbance-based displacement and avoidance,[16] and disturbance at a specific site,[17] 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:

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

[16] Spatial shifts in populations or individual animals away from human activities on or near roads, trails, or networks
[17] 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 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 the OSV Program 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.

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%) martens generally avoid habitats that lack overhead cover (canopy cover less than 30%), 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 into 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 (USFWS 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 marten whelping (March/April) season with 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.). Although there currently are no documented marten den sites on the Lassen National Forest, as they are located, Sierra Nevada Forest Plan Amendment standards and guidelines designed to protect marten den sites[18] 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 or burying of 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 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).

Comparison of the Alternatives:

Although we don't know where, specifically, impacts will 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 conducive to OSV use (high OSV-use areas). As described in the assumptions section, flatter areas with slopes less than 21% and canopy cover less than 70%, including the routes and staging areas, themselves, are more conducive to OSV 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 23, 81% of marten winter habitat is currently open to OSV use (alternative 1). However, only 24% is open to OSV use and conducive to OSV use (map BE-21). 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% of winter habitat. The amount of marten under the remaining alternatives is similar to alternative 1: alternative 2, 23% (map BE-22); alternative 3, 21% (map BE-23), and alternative 4, 23% (map BE-24).

[18] "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."

Table 23. Acres of marten winter habitat[19] with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Open to OSV use	99,740	69,515	64,893	69,364
Closed to OSV use	22,733	52,958	57,578	53,109
OSV use restricted to trails	NA	NA	2	NA
Total	122,473			
Open to OSV use and conducive to OSV use	29,291	28,555	25,999	27,838
Closed to OSV use and conducive to OSV use	22,733	23,469	26,024	24,186
Conducive to OSV use and OSV use restricted to trails	NA	NA	1	NA
Total	52,024			

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 or not 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% are currently open to OSV use (Table 24). However, 38 percent is open to OSV use and conducive to OSV use (map BE-25). 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 the same under alternative 2 (map BE-26). There is little difference in the amount of marten connectivity habitat that would be open to and conducive to OSV use under the other two alternatives [34% under alternative 3 (map BE-27) and 40% under alternative 4 (map BE-28), but alternative 3 would have the least impact on marten connectivity habitat overall.

Table 24. Acres of marten habitat connectivity corridors[20] with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Open to OSV use	156,995	152,303	143,292	156,381
Closed to OSV use	30,245	34,937	43,949	30,859
OSV use restricted to trails	NA	NA	0	NA
Total	187,240			
Open to OSV use and conducive to OSV use	71,494	70,308	64,500	71,039
Closed to OSV use and conducive to OSV use	10,402	11,588	17,395	10,857
Conducive to OSV use and OSV use restricted to trails	NA	NA	0	NA
Total	81,896			

[19] Rustigian-Romsos and Spencer (2010) Conservation Biology Institute Marten Habitat Suitability Model
[20] Least Cost 25% Corridor Modeling (Kirk and Zielinski 2010)

Several marten observations that were concentrated in a 200-acre area fell outside of either the CBI Marten Habitat Suitability Model or the Least Cost 25% 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 conducive to OSV use; 54 percent of the polygon area is conducive to OSV use under all of the alternatives (maps BE-21, BE-22, BE-23, BE-24). 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.

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. 2008). 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 and moderate use occurs within 0.5 miles 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 21-24% of marten winter habitat or 34 – 40% 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 or not disturbance is occurring and if changes in management are necessary. In addition, the objective of minimizing impacts to wildlife during the winter would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

Under all of the action alternatives (i.e., alternatives 2, 3, and 4), route 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 miles of groomed trails and staging areas, or within meadows within 0.5 miles of designated trails, the potential for impacts to subnivean prey species, would be expected to decline with reduced route densities under alternatives 2, 3 and 4.

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 or 4, 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 ungroomed OSV routes 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 marten for vegetation projects prevent disturbance to breeding individuals.

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 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 this activity would occur outside of the marten breeding season under

alternatives 1, 2, and 3. 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 National Forest System 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 have been identified.

Determination Statement

Alternatives 1, 2, 3, and 4 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 Forest Plan 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 21 – 24 percent under all of the alternatives, and connectivity habitat ranges from 34 percent under alternative 3 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.
- 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 within 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 or not 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 route densities under alternatives 2, 3, and 4, are likely to reduce the potential for predation because most OSV use on the Lassen National Forest occurs on groomed routes.
- Reduced route densities, under alternatives 2, 3, and 4, are likely to reduce the potential for impacts to subnivean prey species.

- In addition, the objective of minimizing impacts to wildlife would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

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 (MIS) 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-29 and BE-33 show known California spotted owl activity centers and California spotted owl important habitat[21] occurring within the action area. There are 120,312 acres of known activity sites, when buffered by 0.7 miles (table 26), and 330,312 acres of California spotted owl important habitat (table 27), 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 (CDFW 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

[21] 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 elevational limit was included based upon species elevational range (CDFW 2015).

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 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 and Blakesley et al. 2005b) 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 (Barrows and Barrows 1978, Forsman 1980, Barrows 1981, and 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 (USFWS 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 National Forest System lands) in September 2007. Based on fire severity assessment methods and severity maps (Miller and Thode 2007), a total of approximately 43,938 acres (National Forest System 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 USFWS (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, DFPZ (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 (SOI) 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, alth13ough 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 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 (CDFW 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 (2013) 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 5 to 800 meters of roost or nest locations for an hour. Conditions such as these would only be expected on OSV routes 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 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 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) 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 25.

Table 25. 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
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%)	108,305 (33%)	99,309 (30%)	111,459 (34%)
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%)	38,197 (32%)	33,054 (27%)	37,631 (31%)

California spotted owl is associated with late-successional forests that can be impacted by activities associated with routes. 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:

1. Displacement of populations or individual animals from a route, related to human activities.
2. Disturbance and displacement of individuals from breeding or rearing habitats.
3. 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 routes 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 (USFWS 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 ungroomed routes and staging areas occur within 0.25 miles 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 will 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 conducive to OSV use (high OSV-use areas). As described in the assumptions section, flatter areas with slopes less than 21% and canopy cover less than 70%, including the routes and staging areas, themselves, are more conducive to OSV 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 Department of Parks and Recreation 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 miles 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, and 3, 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 has the potential to 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[22] and duration of trail grooming at any trail segment

[22] 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

location, as well as grooming activity being an ongoing operation for many years on the same trail routes, 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

Tables 26 and 27 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% is open to OSV use and conducive to OSV use (map BE-29). Similarly, eighty-eight percent of important California spotted owl habitat is currently open to OSV use, but only 34% is open to OSV use and conducive to 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 conducive to OSV use. In addition, of the 32% of buffered activity centers and the 34% of important habitat open to and conducive to OSV use, 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 in an even smaller percentage of each of those habitats. This would be similar under the other three alternatives.

Table 26. Acres of known California 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
Open to OSV use	114,001	112,796	99,140	111,669
Closed to OSV use	6,311	7,516	21,159	8,643
Conducive to OSV use and OSV use restricted to trails	NA	NA	13	NA
Total	120,312			
Open to OSV use and conducive to OSV use	38,416	38,197	33,054	37,631
Closed to OSV use and conducive to OSV use	1,341	1,560	5,697	2,126
OSV use restricted to trails	NA	NA	6	NA
Total	39,757			

Under alternative 2, 33% of important California spotted owl habitat (map BE-34) and 33% of buffered PACs (map BE-30) would be open and conducive to OSV use. Similarly, 30% of important habitat (map BE-35) and 27% of buffered PACs would be open and conductive to OSV under alternative 3 (map BE-31) and 34% of important habitat (map BE-36) and 31 percent of buffered PACs under alternative 4 (map BE-32). 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

the OSV Program trail systems, occurs several times during storm events as necessary dependent upon weather conditions (California Department of Parks and Recreation 2010).

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, and 3, and may extend up through the first 1/3 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, and 4) route 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 miles of groomed trails and staging areas, or within meadows within 0.5 miles of designated trails, the potential for impacts to subnivean prey species, would be expected to decline with reduced route densities under alternatives 2, 3 and 4.

Table 27. 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
Open to OSV use	289,906	275,386	250,671	288,372
Closed to OSV use	40,406	54,926	79,589	40,940
OSV use restricted to trails	NA	NA	52	NA
Total	330,312			
Open to OSV use and conducive to OSV use	112,300	108,305	99,280	111,459
Closed to OSV use and conducive to OSV use	9,346	13,341	22,337	10,187
Conducive to OSV use and OSV use restricted to trails	NA	NA	29	NA
Total	121,646			

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 or 4, 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 ungroomed OSV routes or staging areas where the highest OSV use occurs. For example, the Castle DFPZ 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 breeding individuals. 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. These projects are usually excluded from spotted owl reproductive habitat. 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.

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, and 3. 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 National Forest System 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 30 – 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 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 route densities, under alternatives 2, 3, and 4, 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 2004a). 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 (Lassen National Forest 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 (Lassen National Forest 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 when the young fledge until the young 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).

It is important to note that goshawk PACs and territories do not correlate on a one-to-one basis. The territories currently recognized are based on retrospective examination of approximately 34 years (1977 to 2010) of surveys whereas goshawk PACs are delineated prospectively as nesting and/or occupancy are discovered. The prospective delineation of PACs is a conservative management approach. The Forest also follows a conservative approach in eliminating goshawk PACs, which in some cases results in multiple PACs within a single territory.

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, has the potential to 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,[23] and noise generated by snowplows and snowcats used for OSV program operations ranges from 80 to 85

[23] 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).

dBA[24] (California Department of Parks and Recreation 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 (ca. 16 kilometers per hour) and faster driving (ca. 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 total (round-trip) transect length was 800 meters. 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).

[24] 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.

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 28.

Table 28. 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
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 (35%)	113,595 (35%)	105,804 (33%)	116,471 (36%)
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%)	49,539 (44%)	45,672 (40%)	49,344 (40%)

Northern goshawk is associated with late-successional forests that can be impacted by activities associated with routes. 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:

1. Displacement of populations or individual animals from a route, related to human activities.
2. Disturbance and displacement of individuals from breeding or rearing habitats.
3. 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 routes 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 miles (map BE-37), and 325,070 acres of goshawk important habitat[25] (map BE-41), including high-reproductive habitat, on the Lassen National Forest.

Activities greater than one-quarter mile (400 meters) from a goshawk nest site to have little potential to affect nesting goshawks[26]. The OSV season overlaps with the courtship through incubation phases of the goshawk breeding season (Woodbridge and Hargis 2006; Lassen National Forest 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 goshawk PACs, at the time, of which 33 (19 percent) were within 400 meters of designated OSV routes. 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

Tables 29 and 30 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 miles are currently open to OSV use (alternative 1). However 44% is open to OSV use and conducive to

[25] 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.

[26] 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

OSV use (table 29; map BE-37). Similarly, 87 percent of important goshawk habitat is currently open to OSV use, but 35% is open to OSV use and conducive to OSV use (table 30; map BE-41). 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 conducive to OSV use. In addition, of the 44% of buffered activity centers and the 35% of important habitat open to and conducive to OSV use, 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 in an even smaller percentage of each of those habitats; 52 goshawk PACs buffered by 0.25 miles (30%) fall within 0.5 miles of a groomed trail or OSV staging area. This would be similar under the other three alternatives.

Table 29. Acres of goshawk PACs, buffered by 0.25 miles, with potential to be impacted by OSV use and related activities, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Open to OSV use	109,087	107,105	97,547	107,723
Closed to OSV use	4,463	6,444	15,986	5,827
OSV use restricted to trails	NA	NA	17	NA
Total	113,550			
Open to OSV use and conducive to OSV use	49,860	49,539	45,664	49,344
Closed to OSV use and conducive to OSV use	1,487	1,808	5,674	2,003
Conducive to OSV use and OSV use restricted to trails	NA	NA	8	NA
Total	51,347			

Under alternative 2, 35% of important northern goshawk habitat (map BE-42) and 44% of buffered PACs would be open and conducive to OSV use (map BE-38). Similarly, 33% of important habitat (map BE-43) and 40% of buffered PACs (map BE-39) would be open and conductive to OSV under alternative 3 and 36% of important habitat (map BE-44) and 40 percent of buffered PACs (map BE-40) under alternative 4. 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 15th northern goshawk breeding season under alternatives 1, 2, and 3, and may extend up through the first 1/3 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. In addition, the objective of minimizing impacts to wildlife during the winter would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

Under all of the action alternatives (i.e., alternatives 2, 3, and 4) route 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 miles of groomed trails and staging areas, or within meadows within 0.5 miles of designated trails, the potential for impacts to subnivean prey species, would be expected to decline with reduced route densities under alternatives 2, 3 and 4.

Table 30. 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
Open to OSV use	283,076	270,055	248,077	281,570
Closed to OSV use	41,994	55,015	76,953	43,500
OSV use restricted to trails	NA	NA	40	NA
Total	325,070			
Open to OSV use and conducive to OSV use	117,272	113,595	105,804	116,471
Closed to OSV use and conducive to OSV use	10,551	14,228	21,997	11,352
Conducive to OSV use and OSV use restricted to trails	NA	NA	22	NA
Total	127,823			

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 or 4, 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 ungroomed OSV routes or staging areas where the highest OSV use occurs. For example, the Castle DFPZ 2 is proposed on 39 acres within 0.25 mile of the Little Grizzly PAC that is also within 0.25 mile of groomed OSV trail 27N11. However, seasonal limited operating periods required for vegetation projects would prevent disturbance to breeding individuals. As 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 northern goshawk reproductive habitat, in the northwestern portion of the analysis area. However, the area does not overlap with any known ngoPACs. 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 goshawk reproductive habitat. Management prescriptions have emphasized recruitment 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 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 this activity would occur outside of the NGO breeding season under alternatives 1, 2, and 3. 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 one-quarter mile of goshawk habitats may impact habitat availability outside of National Forest System 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, and 4 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 Forest Plan 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 33 - 36 percent, and individuals within buffered PACs ranges from 40 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% of buffered goshawk PACs fall within 0.5 miles 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 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.
- 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.
- In addition, the objective of minimizing impacts to wildlife would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

Wide-ranging Carnivores

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

Candidate Species; Regional Foresters Sensitive Species

The U.S. Fish and Wildlife Service recently released its 12-month finding on a petition to list Sierra Nevada red fox as threatened or endangered (USFWS 2015c). In addition, the Service released a Sierra Nevada red fox species report (USFWS 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 from this that Sierra Nevada red fox likely occur at low population densities even within areas of high relative abundance. Following publication of the U.S. 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 USFWS 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 USFWS 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 (USFWS 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 (CDFW 2015a, p. 1). 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 (CDFW 2015a, p. 1), thereby tending to support the low effective population size estimate (i.e., 21 breeding individuals) of Sacks et al. (2010a, 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 (CDFW 2015a, p. 2). 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 (CDFW 2015a, p. 2).

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 (USDA) 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 104,797 acres of suitable Sierra Nevada red fox habitat[27] is found within the project area (table 32; map BE-45).

Based upon Sierra Nevada red fox monitoring conducted on the Lassen National Forest in 2012, interaction between Sierra Nevada red fox and OSV users 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 potentially 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 size and isolation, specifically for the Lassen and Sonora Pass sighting areas. Potential 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

[27] 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.

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 SNRF 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 SNRF sighting area to the Lassen population is at Sonora Pass, but the distance between them (100 km (62 mi) straight-line distance) is greater than 95 percent of dispersal distances recorded for lowland North American red foxes (80 km (50 mi)) (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 SNRF.

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 SNRF. 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 female SNRF from the Lassen population, captured in 2000 for a radio telemetry study, showed they had not reproduced, either prior to the study or during its 2-year duration, 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 SNRF populations, it appears likely to remain small and isolated for at least the next 50 years.

Based on the best available information, the 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 SNRF.

Vehicles

Potential stressors related to vehicles (including cars, trucks, snowmobiles, and other off highway vehicle (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 SNRF by providing roads and compacted snow trails for travel, and occasional roadkilled animals for scavenging.

The only known incidents of vehicle impacts with SNRF are relatively recent. Since 2010, five SNRF 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 km (50 mi) west of the Crater Lake sighting area.

SNRF 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 SNRF are most active (Perrine 2005, p. 110).

All of the SNRF 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 SNRF sightings in these areas suggests that the SNRF are able to adjust to the noise involved, and that sufficient SNRF prey remain in such areas.

Since vehicles occasionally kill or injure individual SNRF, without rising to the level of affecting entire populations or the subspecies as a whole (now or in the future), the Service considers vehicles to constitute a stressor with a low-level impact on SNRF.

Competition and Predation from Coyotes

Both coyote and SNRF are opportunistic predators with considerable overlap in food consumed (Perrine 2005, pp. 36–37). Although no direct documentation of coyote predation on SNRF 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 SNRF 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 SNRF population (Id. at 192).

During the winter season, Perrine (2005, pp. 30, 78) found that both SNRF and coyotes descended to lower elevations, where mule deer (*Odocoileus hemionus*), (and more specifically in the case of SNRF, mule deer carrion) became important components of their diets. However, SNRF 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 snow packs at higher elevations. SNRF 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. SNRF may also potentially 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 SNRF 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 SNRF 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 SNRF 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 SNRF.

Although, as discussed above, competition and predation from coyotes may be an important factor restricting the lower elevational range of the SNRF, 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 SNRF 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 SNRF 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. SNRF 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 SNRF 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 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. SNRF 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 SNRF 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 SNRF.

Climate Change

Potential climate change impacts to SNRF 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. SNRF have been sighted in the area at elevations ranging from 1,410 m (4,626 ft.) to 3,130 m (10,269 ft.) (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 m (10,463 ft.). Accordingly, as climate change causes losses to snowpacks and forested ecosystems, the preferred habitat for SNRF will tend to shrink. SNRF 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 SNRF 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 31.

Table 31. 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
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[28] impacted by OSV use	32,986 (32%)	31,434 (30%)	28,986 (28%)	28,902 (28%)

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 routes 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 route or human activities on or near a route and, secondarily, creation of a vector pathway for competitors or predators.

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

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 (USFWS 2015c), the USFWS analyzed 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 (USFWS 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: (USFWS 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 (USFWS 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.

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. 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 (USFWS 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); 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 USFWS 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 the OSV Program 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 will 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 conducive to OSV use (high OSV-use areas). As described in the assumptions section, flatter areas with slopes less than 21% and canopy cover less than 70%, including the routes and staging areas, themselves, are more conducive to OSV 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 National Forest System lands (map BE-45). Based upon the information displayed in table 32, 83% of suitable Sierra Nevada red fox habitat is currently open to OSV use (alternative 1). However, only 32% is open to OSV use and conducive to 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% of suitable 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 32% of Sierra Nevada red fox habitat. Under alternative 2, 30% of habitat is open to and conducive to OSV use (map BE-46). Under alternative 3, 28% of habitat is open to and conducive to OSV use (map BE-47[29]) and under alternative 4, 28% (map BE-48).

Table 32. 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
Open to OSV use	85,956	82,910	76,345	81,756
Closed to OSV use	17,847	20,893	27,456	22,047
OSV use restricted to trails	NA	NA	2	NA
Total	103,803			
Open to OSV use and conducive to OSV use	32,986	31,434	28,986	28,902
Closed to OSV use and conducive to OSV use	7,602	9,154	11,601	11,686
Conducive to OSV use and OSV use restricted to trails	NA	NA	1	NA
Total	40,588			

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

Based upon Sierra Nevada red fox monitoring conducted on the Lassen National Forest in 2012, interaction between Sierra Nevada red fox and OSV users 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 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 open to 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. In addition, the objective of minimizing impacts to wildlife during the winter would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

Under all of the action alternatives (i.e., alternatives 2, 3, and 4) route 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 miles of groomed trails and staging areas, or within meadows within 0.5 miles of designated trails, the potential for impacts to subnivean prey species, would be expected to decline with reduced route densities under alternatives 2, 3 and 4.

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 or 4, 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 ungroomed OSV routes or staging areas where the highest OSV use occurs. For example, the Castle DFPZ 2 is proposed on 39 acres and 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 some suitable Sierra Nevada red fox reproductive habitat. Limited operating periods are required for Sierra Nevada red fox for vegetation management projects to prevent potential impacts to breeding individuals. 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 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 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 this activity would occur outside of the Sierra Nevada red fox breeding season under alternatives 1, 2, and 3. 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 National Forest System 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, and 4 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 Forest Plan 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 28 – 32% 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 users 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.
- 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 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 open to 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.
- In addition, the objective of minimizing impacts to wildlife would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.
- Reduced route densities, under alternatives 2, 3, and 4, 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. Forty 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 which 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. Sixteen 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 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, 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 (ca. 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 for additional information). However, the minimum cross-country snow depth of 12 inches for all of the alternatives, including the existing condition, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016).

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 or 4, 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 identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and ungroomed OSV routes or staging areas where the highest OSV use occurs. For example, the Castle DFPZ 2 is proposed on 39 acres. However, seasonal limited operating periods required for raptor and other sensitive species for vegetation projects to prevent disturbance to breeding individuals could also prevent disturbance to breeding bats. As 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 in the northwestern portion of the analysis area. 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 areas with larger, mature trees that serve as roosts for bats. In addition, management prescriptions have emphasized recruitment of large snags and logs and retention of large conifer.

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 National Forest System 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 CaliforniaPallid 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, Ball 2002, 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, but ranged from 40 to 1,850 meters.

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 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 prior to 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 36º 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), 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 that 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 for additional information). However, the minimum cross-country snow depth of 12 inches under all of the alternatives, including the existing condition, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016).

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 or 4, 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 ungroomed OSV routes or staging areas where the highest OSV use occurs. For example, the Castle DFPZ 2 is proposed on 39 acres. However, seasonal limited operating periods required for raptor species for vegetation projects to prevent disturbance to breeding individuals could also prevent disturbance to breeding bats. As 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 in the northwestern portion of the analysis area. 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 areas with larger, mature trees that serve as reproductive habitat and roosts for bats. In addition, management prescriptions have emphasized recruitment of large snags and logs and retention of large conifer.

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 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 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 National Forest System 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 Forest Plan area based on the following:

- Proposed actions will not physically modify pallid bat habitat.
- Proposed actions will 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, Jones and Suttkus 1972) 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, Twente 1955). *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 U.S. 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, Twente 1955). 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, Twente 1955), 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, although mine shafts. 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 highly 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 not be able to find suitable replacement habitat.

The resurgence of gold mining in the West potentially threatens cave-dwelling bat species (Brown and Berry 1991, Brown et al. 1993, Brown 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 for additional information). However, the minimum cross-country snow depth of 12 inches under all of the alternatives, including the existing condition, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016).

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 or 4, 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 ungroomed OSV routes or staging areas where the highest OSV use occurs. For example, the Castle DFPZ 2 is proposed on 39 acres. However, seasonal limited operating periods required for raptor species for vegetation projects to prevent disturbance to breeding individuals could also prevent disturbance to breeding bats. As 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 in the northwestern portion of the analysis area. 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 areas with larger, mature trees that serve as roosts for bats. In addition, management prescriptions have emphasized recruitment of large snags and logs and retention of large conifer.

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 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 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 National Forest System 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 Forest Plan 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 (Lassen National Forest 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 (U.S. 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 (Lassen National Forest 2010).

Bald eagles require open water with juxtaposed mature trees or steep cliffs for nesting, perching, foraging, and roosting (Bent 1961 in Murphy and Knopp 2000). 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[30] (map BE-49) and 26,668 acres of bald eagle reproductive habitat[31] (map BE-53) on forest system lands within the Lassen National Forest boundary.

Threats

The Recovery Plan for the Pacific Bald Eagle (USFWS 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 (USFWS 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 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 (USFWS 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[32] 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

[30] 660 foot nest site buffers based on USFWS (2007)
[31] 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.
[32] 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.

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 (USFWS 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 33.

Table 33. 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
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%)	7,374 (28%)	7,096 (27%)	7,962 (30%)
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 (60%)	663 (54%)	454 (37%)	741 (60%)

The Lassen National Forest currently has 26,668 total acres of high-value reproductive habitat (map BE-49) and 1,239 acres of bald eagle nest trees on National Forest System Lands buffered by 660 feet (map BE-53).

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

Tables 34 and 35 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, 60 percent are open to OSV use and conducive to OSV use (map BE-49). Similarly, 83 percent of reproductive habitat is currently open to OSV use, but 30% is open to OSV use and conducive to OSV use (map BE-53). 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 conducive to OSV use. In addition, of the 60% of buffered activity centers and the 30% of reproductive habitat open to and conducive to OSV use, 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 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 U.S. 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. In addition, the objective of minimizing impacts to wildlife during the winter would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.

Table 34. 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
Open to OSV use	1,175	1,076	695	1,175
Closed to OSV use	64	163	544	64
OSV use restricted to trails	NA	NA	0	NA
Total	1,239			
Open to OSV use and conducive to OSV use	741	663	454	741
Closed to OSV use and conducive to OSV use	48	126	335	48
Conducive to OSV use and OSV use restricted to trails	NA	NA	0	NA
Total	789			

Under alternative 4, the same amounts of buffered eagle nest sites (map BE-52) and reproductive habitat (map BE-56) as alternative 1 have the potential to be impacted by OSV use and 2 additional nest sites would be located within 1.5 miles of designated OSV use trails. 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 at 28% (map BE-50) and 54% (map BE-54), respectively. Under alternative 3, the percentage of reproductive habitat with the potential to be impacted by OSV use is similar to the other alternatives (28%; map BE-55), but the percentage of buffered nest sites with the potential to be impacted by OSV use under alternative 3 (37%; map BE-51) would be substantially less than the other alternatives because areas under 3,500 feet would not be designated for OSV use. Under both 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, or 4 and, therefore, no disturbance impacts to breeding bald eagles are expected under any of the alternatives.

Table 35. 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
Open to OSV use	22,049	21,044	20,015	21,806
Closed to OSV use	4,619	5,624	6,651	4,862
OSV use restricted to trails	NA	NA	1	NA
Total	26,668			
Open to OSV use and conducive to OSV use	7,962	7,374	7,095	7,926
Closed to OSV use and conducive to OSV use	1,588	2,176	2,454	1,624
Conducive to OSV use and OSV use restricted to trails	NA	NA	1	NA
Total	9,550			

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 or 4, 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 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 this activity would occur outside of the bald eagle breeding season under alternatives 1, 2, and 3. 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 National Forest System 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, and 4 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 Forest Plan 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 27 – 30% 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 37 percent of buffered bald eagle nests under alternative 3 and 54 to 60 percent of buffered bald eagle nests under alternatives 1, 2, and 4, 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.
- In addition, the objective of minimizing impacts to wildlife would be addressed by developing a public outreach program to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funding allow.
- 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[33] on National Forest System lands within the project area (table 37; map BE-57).

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 36.

Table 36. 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
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%)	31,496 (36%)	29,900 (34%)	31,858 (37%)

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 routes 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 great gray owl, should it be present.

Although great gray owls have not been confirmed on the Lassen National Forest, they have been observed in the nearby vicinity and, over time, could have the potential to be affected by Forest OSV activities. Snowplay in meadows may prevent great gray owl use of 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 area present on the Lassen National Forest, the

[33] 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.

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[34] 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 37 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% is open to OSV use and conducive to OSV use (map BE-57). The potential for OSV-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 conducive to OSV use. In addition, of the 37% of habitat open to and conducive to OSV use, 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 in an even smaller percentage of each of those habitats. This would be true under the other three alternatives.

[34] 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).

Under alternative 2, 36% of great gray owl reproductive habitat would be open and conducive to OSV use (map BE-58). Similarly, 34% would be open and conducive to OSV use under alternative 3 (map BE-59), and 37% under alternative 4 (map BE-60). 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 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.

Table 37. 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
Open to OSV use	77,460	75,255	70,736	76,868
Closed to OSV use	9,285	11,490	15,993	9,877
OSV use restricted to trails	NA	NA	16	NA
Total	86,745			
Open to OSV use and conducive to OSV use	32,228	31,496	29,892	31,858
Closed to OSV use and conducive to OSV use	3,669	4,401	5,997	4,039
Conducive to OSV use and OSV use restricted to trails	NA	NA	8	NA
Total	35,897			

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 or 4, 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 ungroomed OSV routes or staging areas where the highest OSV use occurs. For 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 some within or adjacent to suitable great gray owl reproductive habitat. However, limited operating periods required for vegetation management and road construction prevent impacts to breeding great gray owls. 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 that benefit great gray owl. These projects are usually excluded from larger CWHR types.

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 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 this activity would occur outside of the great gray owl breeding season under alternatives 1, 2, and 3. 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 National Forest System 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, and 4 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 Forest Plan 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 34 – 37% 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.
- 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 2000 and 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) restore meadows currently occupied by willow flycatchers, and (2) restore 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 (Lassen National Forest 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 acres (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 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 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 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. The minimum cross-country snow depth of 12 inches 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 for additional information). However, the minimum cross-country snow depth of 12 inches under all of the action alternatives, including the existing condition, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to water quality (McNamara 2016).

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 Forest Plan 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 all of the alternatives, including the existing condition, 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 (Lassen National Forest 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 (Lassen National Forest 2010); predation; human disturbance of crane pairs during the nesting season; and the spread of invasive plants into greater sandhill crane habitats (USFWS 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 for additional information). However, the minimum cross-country snow depth of 12 inches under all of the alternatives, including the existing condition, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016).

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 Forest Plan 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 all of the alternatives, including the existing condition, is expected to be adequate to protect wet meadow and fresh emergent wetland habitats utilized by this species from measurable impacts to vegetation or water quality.

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 all of the alternatives, including the existing condition, 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 Forest Plan 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 of 12 inches under all of the alternatives, including the existing condition, 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 National Forest System 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 of water; however some females nest upwards of 400 meters 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-caused 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 open to 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 for additional information). However, the minimum cross-country snow depth of 12 inches under all of the action alternatives, including the existing condition, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016).

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 or 4, include the Castle DFPZ 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 DFPZ 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, and 4 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 Forest Plan 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 of 12 inches 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 (Bureau of Land Management 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 (Bureau of Land Management 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 all of the alternatives, including the existing condition, is expected to be adequate to protect moist bottomland habitats utilized by this species from measurable impacts to vegetation or water quality (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 for additional information). However, the minimum cross-country snow depth of 12 inches under all of the alternatives, including the existing condition, is expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016).

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 Forest Plan area because it 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 of 12 inches under all of the alternatives, including the existing condition, 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 of the alternatives, including the existing condition, is expected to be adequate to protect vegetation from measurable impacts (McNamara 2016).

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 Forest Plan 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 of 12 inches to be maintained under all of the alternatives.

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Appendix H. Management Indicator Species and Migratory Landbird Report

Management Indicator Species

Management Indicator Species (MIS) are animal species identified in the SNF MIS Amendment Record of Decision (ROD) signed December 14, 2007, which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). Guidance regarding MIS set forth in the Lassen NF's 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 Lassen NF LRMP as amended.

Selection of Project-level MIS

MIS for the Lassen NF are listed in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007). The habitats and ecosystem components and associated MIS analyzed for the project were selected from this list, as indicated in the table below. The table discloses the habitat or ecosystem components (1st column), the California Wildlife Habitat Relationships (CWHR) type(s) defining each habitat/ecosystem component (2nd column), the associated MIS (3rd column), and whether or not the habitat of the MIS is potentially affected by the Lassen OSV Project (4th column). The MIS whose habitat would be either directly or indirectly affected by the Lassen OSV Project, identified as Category 3 in the table, are carried forward in this analysis, which will evaluate the effects of the proposed action and alternatives on the habitat of these MIS. The MIS selected for project-level MIS analysis for the Lassen OSV Project are: mule deer, mountain quail, sooty (blue) grouse, California spotted owl, Pacific marten, and northern flying squirrel.

Table 1 - Selection of MIS for the Lassen OSV Project

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component[35]	Sierra Nevada Forests Management Indicator Species *Scientific Name*	Category for Project Analysis[36]
Riverine & Lacustrine	lacustrine (LAC) and riverine (RIV)	aquatic macroinvertebrates	2. Won't exceed any critical thresholds. See aquatics and hydrology report.
Shrubland (west-slope chaparral types)	montane chaparral (MCP), mixed chaparral (MCH), chamise-redshank chaparral (CRC)	fox sparrow *Passerella iliaca*	2

[35] 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).

[36] **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.

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component[35]	Sierra Nevada Forests Management Indicator Species *Scientific Name*	Category for Project Analysis[36]
Oak-associated Hardwood & Hardwood/conifer	montane hardwood (MHW), montane hardwood-conifer (MHC)	mule deer *Odocoileus hemionus*	3
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. Won't exceed any critical thresholds. See Aquatics and hydrology report.
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*	3
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*	3
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*	3
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*	3
		Pacific marten[3] *Martes caurina*	
		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

[3]Pacific marten (*Martes caurina*) was formally known as American marten (*Martes americana*)

Species and habitat components not discussed further:

Fox sparrow (Shrubland component) will not be discussed in further detail because the Lassen OSV Project alternatives would not change acres of shrub habitat, ground shrub cover class, or shrub size class. The project alternatives focus on designation of trails in where deep snow is persistent and during the winter months when Fox sparrow are generally not present or breeding.

Yellow warbler (Riparian component) will not be discussed in further detail because the Lassen OSV Project alternatives would not change riparian habitat acres, deciduous canopy cover, total canopy cover, or CWHR size class within montane riparian habitats.

Hairy woodpecker and Black-backed woodpecker (Snags in Green Forest component and Snags in Burned Forest component) will not be discussed in further detail because under the Lassen OSV Project alternatives there would be no vegetation management associated with this project. Snags in green forest or burned forest will not be modified by the project design. Occasional trees that fall across trails or pose

an immediate safety risk may be felled, bucked and left in place, but these operations are part of routine forest maintenance and public safety.

Species and habitat components discussed further:

Mule deer (Oak-associated Hardwood and Hardwood/conifer component) will be discussed in further detail because Oak-associated Hardwoods and Hardwood/conifer stands are lower elevation and are important to mule deer as winter range foraging and cover habitat. Effects to these habitats will be analyzed in particular where mule deer winter range is present in designated over-snow use areas.

Mountain quail or Sooty grouse (Mid seral coniferous forest or Late seral open canopy coniferous forest habitat component) will be discussed in further detail because the Lassen NF contains acres of early, mid seral, and late seral open canopy coniferous forest habitat which exists widespread across the Forest. The Lassen OSV Project would designate over-snow use in these areas which could affect habitat for these species.

California spotted owl, Pacific marten, and northern flying squirrel (Late Seral Closed Canopy Coniferous Forest component) will be discussed in further detail because Late Seral Closed Canopy Coniferous Forest exists in certain locales across the Forest. The Lassen OSV Project would designate over-snow use in these areas which could affect habitat for these three species.

Comparison Table of OSV use between Alternatives

The proposed activities and their variation between alternatives can be summarized by examining the different categories listed below in the following table. A couple of activity comparisons are the same for all four alternatives such as the minimum snow depth for cross-country OSV use is 12 inches and the grooming season for all alternatives is 12/26 to 3/31.

Table 2 - OSV Activity Comparison for each Alternative

Alternative	Total OSV Use (acres)	OSVs Not Allowed and Not Designated for OSV Use (acres)	Snow[1] Depth for grooming	Total mileage of groomed trails
1 – Current condition	964,020 ac	186,000 ac	18 Inches	349 miles
2 – Modified Proposed Action	921,130 ac	228,890 ac	12 inches	349 miles
3 – Non Motorized Emphasis	834,660 ac	315,360 ac	18 Inches	349 miles
4 – Motorized Emphasis	958,930 ac	191,090 ac	12 inches	349 miles

In this MIS analysis, the best measure to evaluate and compare the potential effects for each MIS species is the activity displayed in the category “Total OSV Prohibitions, including elevation limits” where the activity overlaps the Habitat Component (CWHR Types) for the given MIS. For the other categories, their figures are either a) already reflected in the category being displayed (i.e., Total OSV Use Acres, or OSV Use Restriction to Designated Trails) or b) the activity does not correlate to any meaningful differences between alternatives considering that base resources and available habitat is not expected to be modified in alternatives.

Species and habitat component analysis

Effects on Oak associated Hardwood and Hardwood/Conifer (Mule Deer)

Mule deer was selected as the MIS for the ecosystem component oak associated hardwood and hardwood/conifer. Mule deer range and habitat includes coniferous forest, foothill woodland, shrubland, grassland, agricultural fields, and suburban environments. Suitable habitat is composed of four distinctly different elements: fawning, foraging, cover, and winter range. Hiding and thermal cover is typically close to the ground and thick enough to camouflage the outline of the deer, without being so dense as to obscure the approach of potential predators. Thermal cover is similar and generally thought to be denser, with the additional property of sheltering deer from the elements. Winter range tends to be in lower elevation habitats that meet the requirements for forage, hiding, and thermal cover described above. Mule deer migrate seasonally between higher elevation summer range and low elevation winter range.

Habitat Factor(s) for the Analysis:

(1) Oak associated hardwood (code MHW - all sizes) and (2) montane hardwood-conifer (MHC – all sizes).

Figure 1. OSV use within mule deer habitat on the Lassen NF under Alternative 1

Figure 2. OSV use within mule deer habitat on the Lassen NF under Alternative 2

Figure 3. OSV use within mule deer habitat on the Lassen NF under Alternative 3

Figure 4. OSV use within mule deer habitat on the Lassen NF under Alternative 4

Direct and Indirect Effects

In the current condition (Alternative 1), the amount of the montane hardwood/conifer ecosystem component that represents mule deer as an MIS species is approximately 54,653 acres. MIS habitat in the project area is estimated to be stable, and adequate to continue to support a stable population. OSV use is already prohibited in approximately 50% of this habitat. Alternative 3 would prohibit OSV use in an additional 78.9% of the habitat, with most of these benefits a result that off-trail OSV use would no longer occur below 3,500 feet in elevation. Alternative 4 is nearly identical to the current condition regarding effects to mule deer and associated habitat.

Table 3 - Effects to MIS Habitat for Mule Deer

Existing MIS Habitat	Alt 1 - MIS Habitat in OSV Prohibited areas	Alt 2- MIS Habitat in OSV Prohibited areas	Alt 3- MIS Habitat in OSV Prohibited areas	Alt 4- MIS Habitat in OSV Prohibited areas	Comment
Mule Deer Oak montane hardwood (MHW), montane hardwood-conifer (MHC) Total Available 54,653 acres	27,550 ac (50.4%)	37,517 ac (68.6%)	43,139 ac (78.9%)	27,593 ac (50.4%)	Closing OSV use in low elevation areas results in an approximate 29% improvement for Alt. 3 compared to alternatives 1 and 4.

Summary of Mule Deer Status and Trend at the Bioregional Scale

This section summarize the habitat and distribution population status and trend data for the mule deer as of 2015. This information is drawn from the California Department of Fish and Wildlife (CDFW) assessment of herd condition as described in the CDFW Deer Management Program 2015.

The deer herds at the Sierra Nevada bioregional scale include California Zones X3b, X3a, X1, X2, C4, D3, X7a, X7b, X9a, D4, D5, and D6. Deer populations in these zones are considered stable to slightly declining, yet considerably below levels seen in the late 1960's and 1970's.

As with most deer herds in California and other western states, the long-term population trend of mule deer is currently steady, but declined from the 1960’s and 1970’s. These long-term declines have been due to land management practices that have precluded fire, resulting in changes toward more mature and less diverse habitats, and reduced quality and quantity of deer habitats. Short-term fluctuations in deer populations are usually attributed to weather events that affect forage production.

Relationship of Project-level Effects to Bioregional-Scale Trend

The project alternatives would cause minimal change in mule deer populations, trends, or the montane hardwood/conifer habitat associated with mule deer. The proposed project amounts to a maximum of nearly 29% improvement within the Lassen OSV Project Area (Alternative 3) by prohibiting off-trail OSV use in areas below 3,500 feet. Given the ubiquity of mule deer MIS habitat across the bioregion, this small change at the project level would not alter the bioregional trend in the habitat, nor would it lead to a change in the population or distribution of mule deer across the Sierra Nevada bioregion.

Effects on Early Seral and Mid-Seral Coniferous Forest (Mountain Quail)

The mountain quail (*Oreortyx pictus*) is the MIS for early and mid-seral coniferous forest habitat on the ten Sierra Nevada National Forests (Eldorado, Inyo, Lassen, Modoc, Plumas, Sequoia, Sierra, Stanislaus,

and Tahoe National Forests and the Lake Tahoe Basin Management Unit). In California, mountain quail is a common to uncommon resident, found typically in most major montane habitats of the state (CDFG 2005). It is a hunted species in California. Typical causes of mortality include predation by accipiters, great horned owl, coyote, bobcat, gray fox, long-tailed weasel, and rattlesnake; accidents, including nests disturbed or trampled by cattle, sheep, and deer, and nests lost to logging activities, and drowning in livestock watering devices without escape ramps and reservoirs too large for quail to fly across; fire; drought; snow and cold; and competition with other species (Gutierrez and Delehanty 1999).

Habitat Factor(s) for the Analysis

The following parameters were used to estimate the amount of early seral and mid-seral conifer MIS habitat component:

Early Seral = 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.

Mid-seral = ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 4, all canopy closures.

Figure 5. OSV use within Mountain quail habitat on the Lassen NF under Alternative 1

Figure 6. OSV use within Mountain quail habitat on the Lassen NF under Alternative 2

Figure 7. OSV use within Mountain quail habitat on the Lassen NF under Alternative 3

Figure 8. OSV use within Mountain quail habitat on the Lassen NF under Alternative 4

Direct and Indirect Effects

The total available habitat within this ecosystem component is 73,184 acres of early seral coniferous forest and 535,040 acres of mid-seral coniferous forest equaling 608,224 acres. Mountain quail populations on the Lassen National Forest are considered to be stable with habitat common and well distributed across the Forest. Direct effects to mountain quail are temporary disturbances where motorized use overlaps an area in place and time occupied by quail. However, that disturbance is not expected to modify the availability of habitat or occupancy by the birds. Current OSV use has maintained stable population trends and occupancy. Considering that motorized disturbances are the primary effect, the measure best able to compare the effects to this species and ecosystem component between alternatives is the change in the amount of habitat where OSV use is prohibited. In the current condition (Alternative 1), OSV use is prohibited on approximately 3,329 acres (4.5%) of the early seral habitat component and 38,154 acres (5.2%) of the mid-seral habitat component. All alternatives are similar in that OSV use is prohibited in a relatively small portion of the habitat which is abundant across the landscape. Alternative 3 represents the alternative with the most positive effect on quail because OSV use is prohibited in approximately 12% of early seral habitat (7.5% improvement over the existing condition) and approximately 18% of mid-seral habitat (12.8% improvement) over the existing condition.

Table 4 - Effects to MIS Habitat for Mountain Quail

Existing MIS Habitat	Alt 1 - MIS Habitat in OSV Prohibited areas	Alt 2- MIS Habitat in OSV Prohibited areas	Alt 3- MIS Habitat in OSV Prohibited areas	Alt 4- MIS Habitat in OSV Prohibited areas	Comment
Mountain Quail - Early Seral Coniferous Forest (Total acres = 73,184)	3,329 ac (4.5%)	4,687 ac (6.4%)	8,786 ac (12%)	3,603 ac (4.9%)	All alternatives are similar in that OSV use is prohibited in a relatively small portion of the habitat across the landscape. Alternative 3 represents the alternative with the most positive effect on quail because OSV use is prohibited in approximately 12% of early seral habitat compared to 4.5% in the existing condition.
Quail - Mid Seral Coniferous Forest (Total acres = 535,040)	38,154 ac (5.2%)	49,069 ac (9.2%)	96,547 ac (18%)	41,886 ac (7.8%)	All alternatives are similar in that OSV use is prohibited in a relatively small portion of the habitat across the landscape. Alternative 3 represents the alternative with the most positive effect on quail because OSV use is prohibited in approximately 18% of mid- seral habitat compared to 5.2 % in the existing condition.

Summary of Mountain Quail Status and Trend at the Bioregional Scale

Current data indicates that the distribution of mountain quail populations in the Sierra Nevada is stable (Roberts et al. 2015).

Relationship of Project-level Effects to Bioregional-Scale Trend

As a result of the action alternatives, there would minimal expected change in trends for mountain quail or the early seral and mid-seral conifer habitat component. The project level changes between alternatives represent an improvement by increasing the areas where OSV use is prohibited within the ecosystem component. However, those improvements are small (up to 7.5% improvement within early seral habitat and up to 12.8% improvement within mid-seral habitat) when compared to the existing

condition (Alternative 1) with alternative 3 being the most improved. Given the ubiquity of this ecosystem component across the bioregion, this small change at the project level would not alter the stable bioregional trend in the habitat component, nor would it lead to a change in the population or distribution of mountain quail across the Sierra Nevada bioregion.

Effects on Late Seral Open Canopy Coniferous Forest (Sooty (blue) Grouse)

The sooty grouse, which used to be known as the blue grouse, is the MIS for late seral open canopy coniferous forest habitat on the ten Sierra Nevada National Forests. It is a hunted species. In California, the sooty grouse is an uncommon to common permanent resident at middle to high elevations within the North Coast Ranges in northwestern California, and the Klamath, Sierra Nevada, and portions of the Warner, White, and Tehachapi Mountains (CDFG 2005). Sooty grouse occurs in open, medium to mature-aged stands of fir, Douglas-fir, and other conifer habitats, interspersed with medium-to-large openings and available water. Sooty grouse pluck on shrubs, grasses and plants for seeds and insects from the ground and in the tree canopy; their winter diet largely includes needles, buds, cones, and twigs in conifer stands, and their summer diet also includes insects, land snails, grasshoppers, and spiders. Sooty grouse breed from early April to late August, with 6-8 eggs hatching from a ground nest (built under logs, stumps, and snags) in late May to mid-June. Primary risks and management concerns discussed by the California Department of Fish and Wildlife include heavy grazing, newly cut forests for timber, stands being treated for fuels reduction, and repeated long term burning (CDFG 2005).

Habitat Factor(s) for the Analysis

The following parameters were used to estimate the amount of late seral open canopy habitat component:

Ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 5, canopy closures S and P.

Figure 9. OSV use within Sooty (Blue) grouse habitat on the Lassen NF under Alternative 1

Figure 10. OSV use of Sooty (Blue) grouse habitat on the Lassen NF under Alternative 2

Figure 11. OSV use within Sooty (Blue) grouse habitat on the Lassen NF under Alternative 3

Figure 12. OSV use of Sooty (Blue) grouse habitat on the Lassen NF under Alternative 4

Direct and Indirect Effects

The total available habitat within this ecosystem component is 16,020 acres of late seral open coniferous forest. Sooty grouse populations on the Lassen National Forest are considered to be stable with habitat widely distributed in small parcels across the Forest. Direct effects to sooty grouse are temporary disturbances where motorized use overlaps an area in place and time occupied by grouse. However, that disturbance is not expected to modify the availability of habitat or occupancy by the birds. Current use has maintained stable population trends and occupancy. Considering that motorized disturbances are the primary effect, the measure best able to compare the effects to this species and ecosystem component between alternatives is the change in the amount of habitat where OSV use is prohibited. Alternative 4 is closest to the current condition which includes approximately 3,666 acres (22.8% of late seral open ecosystem component) where OSV use is prohibited. Alternative 3 shows a moderate increase over current condition in areas where prohibited OSV use overlaps grouse habitat totaling 5,361 acres (33.4%) which is a 10% improvement over current condition.

Table 5 - Effects to MIS Habitat for Sooty Grouse

Existing MIS Habitat	Alt 1 - MIS Habitat in OSV Prohibited areas	Alt 2- MIS Habitat in OSV Prohibited areas	Alt 3- MIS Habitat in OSV Prohibited areas	Alt 4- MIS Habitat in OSV Prohibited areas	Comment
Sooty Grouse - Late Seral Open Canopy Coniferous Forest (Total acres = 16,020)	3,666 ac (22.8%)	3,911 ac (24.4%)	5,361 ac (33.4%)	3,716 ac (23.2%)	Blue Grouse - Alts. 1,2, 4 protect 22% to 24% while Alt. 3 protects 33%

Summary of Status and Trend at the Bioregional Scale

The sooty grouse has been monitored in the Sierra Nevada at various sample locations by hunter survey, modeling, point counts, breeding bird survey protocols:

- California Department of Fish and Wildlife Blue (Sooty) Grouse Surveys (Bland 1993, 1997, 2002, 2006, 2013).
- California Department of Fish and Wildlife hunter survey, modeling, and hunting regulations assessment (CDFG 2004a, CDFG 2004b, 2015)
- Multi-species inventory and monitoring on the Lake Tahoe Basin Management Unit (USDA Forest Service 2007b).
- 1968 to present – BBS routes throughout the Sierra Nevada (Sauer et al. 2014).

Sooty grouse continue to be detected and bagged through hunting across the Sierra Nevada (CDFW 2015). In addition, modeling based on game take survey and habitat acres indicates that the spring breeding population can more than sustain the total annual mortality, including hunting mortality (CDFW 2004a). Sooty grouse have continued to be detected on BBS routes in the Sierra Nevada showing a stable trend over time (Sauer et al. 2014).

Relationship of Project-Level Effects to Bioregional-Scale Trend

As a result of the action alternatives, there would minimal expected change in populations or population trends for sooty grouse, nor to the late-seral open canopy ecosystem component with which they are associated. The current condition in the project area indicates that OSV use may be occurring in approximately 77% of the ecosystem component. In comparison to the current condition (Alt. 1),

Alternatives 2 and 4 represents no change in OSV use as it relates to this MIS. Alternative 3 indicates a small improvement over the current condition by increasing the acreage where OSV use is prohibited. Given the ubiquity of this ecosystem component across the bioregion, the small effects at the project level would not alter the bioregional trend in the ecosystem component, nor would it lead to a change in the distribution or population of sooty grouse across the project area or the Sierra Nevada bioregion.

Late Seral Closed Canopy Coniferous Forest (California spotted owl, Pacific marten, northern flying squirrel)

There are three species associated with this habitat component. They include the California spotted owl, Pacific marten, and the northern flying squirrel. The spotted owl and the marten are analyzed in more depth in the Biological Evaluation (BE) for the Lassen OSV project, and those results have been considered in this MIS report. The primary goal of this MIS report differs from the BE in that this report evaluates how, if at all, project effects will contribute to any changes in the MIS species trends in the Sierra Nevada Bioregion.

The California spotted owl occurs only in California, on the western side of the Sierra Nevada (and very locally on the eastern slope). The California spotted owl is strongly associated with forests that have a complex multi-layered structure, large-diameter trees, and high canopy closure (CDFG 2005, USFWS 2006). It uses dense, multi-layered canopy cover for roost seclusion; roost selection appears to be related closely to thermoregulatory needs, and the species appears to be intolerant of high temperatures (CDFG 2005). Mature, multi-layered forest stands are required for breeding (Ibid). The mixed-conifer forest type is the predominant type used by spotted owls in the Sierra Nevada: about 80 percent of known sites are found in mixed-conifer forest, with 10 percent in red fir forest (USDA Forest Service 2001). The following factors are the primary types of activities that negatively affect the California spotted owl (USFWS 2006): destruction or modification of habitat by wildfire, fuels-reduction activities, timber harvest, tree mortality, and land development.

The Pacific marten (formerly American marten) occurs from the southern Rockies in New Mexico northward to the tree-line in Canada and Alaska, and from the southern Sierra Nevada eastward to Newfoundland in Canada; in Canada and Alaska, martens have a vast and continuous distribution, but in the contiguous western United States, martens are limited to mountain ranges within a narrow band of coniferous forest habitats. Optimal habitats in California are various mixed evergreen forests with more than 40% crown closure, with large trees and snags, especially within red fir, lodgepole pine, subalpine conifer, mixed conifer, Jeffrey pine, and eastside pine (CDFG 2005). Martens prefer coniferous forest habitat with large diameter trees and snags, large down logs, moderate-to-high canopy closure, 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. Marten are trapped easily (CDFG 2005). Decreases in habitat quality and quantity can occur from activities that cause the removal of overhead forest cover, removal of large diameter trees and coarse woody debris, and the conversion of mesic to xeric sites with associated changes in prey communities (CDFG 2005). Three factors make martens vulnerable to local extirpation and extinction: (1) low reproductive potential; (2) an affinity for overhead cover and avoidance of extensive open areas, especially in winter; and (3) very large home ranges (USDA Forest Service 2001).

The northern flying squirrel, in California, is a locally common, yearlong resident of coniferous forests from 1,500-2,450 m elevation (5,000-8,000 ft) of the North Coast, Klamath, Cascade, Sierra Nevada Ranges, and the Warner Mountains (CDFG 2005). The northern flying squirrel occurs primarily in mature, dense conifer habitats intermixed with various riparian habitats, using cavities in mature trees, snags, or logs for cover (CDFG 2005). Management concerns include loss of habitat, including snags, and

predation by large owls, especially spotted owls, domestic cats, martens, fishers, bobcats, and long tailed weasels (CDFG 2005).

Habitat Factor(s) for the Analysis

The following parameters were used to estimate the amount of late seral closed canopy ecosystem component:

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.

Figure 13. Late seral closed canopy MIS habitat on the Lassen National Forest

Figure 14. OSV use within Late seral closed canopy habitat on the Lassen NF under Alternative 2

Figure 15. OSV use within Late seral closed canopy habitat on the Lassen NF under Alternative 3

Figure 16. OSV use within Late seral closed canopy habitat on the Lassen NF under Alternative 4

Direct and Indirect Effects

The total available habitat within this ecosystem component is 80,938 acres of late seral closed canopy coniferous forest. Populations of all three MIS species are considered to be stable on the Forest considering that distribution population monitoring indicates the species remains present in all previously known locations and the complex structure of this habitat type would not be modified in the project proposal. Direct effects are temporary disturbances where motorized use overlaps occupied habitat and could cause local and temporary changes in behavior of individuals in an effort to avoid encountering motorized over-snow vehicles. A more detailed description and analysis of effects for California Spotted Owl and Pacific marten is included in the Biological Evaluation which determined that all alternatives of the Lassen OSV Project "may affect individuals, but are not likely to lead to a loss of viability or a trend toward federal listing." Effects to northern flying squirrels are the same as analyzed for the other MIS species which depend on this habitat type. Considering that motorized disturbances are the primary effect from this project to individuals of all three species, the measure best able to compare the effects to these species and habitat component between alternatives is the change in the amount of habitat where OSV use is prohibited. The current condition (Alternative 1), Alternative 2, and Alternative 4 are similar to each other in that the areas closed to OSV use make up 11,257 acres (14%), to 14,459 acre (17.8%), of the total available habitat component. Alternative 3 shows a moderate increase in areas where prohibited OSV use overlaps the habitat component totaling 18,381 acres (22.7%) which is a 8.7% improvement over the current condition.

Table 4 - Effects to MIS Habitat for California Spotted Owl, Pacific Marten, and Northern Flying Squirrel

Existing MIS Habitat	Alt 1 - MIS Habitat in OSV Prohibited areas	Alt 2- MIS Habitat in OSV Prohibited areas	Alt 3- MIS Habitat in OSV Prohibited areas	Alt 4- MIS Habitat in OSV Prohibited areas	Comment
Late Seral Closed Canopy Coniferous Forest (Ca. Spotted Owl, Marten, flying squirrel) (Total acres = 80,938)	11,257 ac (14%)	14,459 ac (17.8%)	18,381 ac (22.7%)	11,801 ac (14.5%)	Late Seral Dense Canopy varies between 14 to 17% for alts 1, 2, and 4, with 22% for alt. 3.

Summary of Status and Trend at the Bioregional Scale

California Spotted Owls

California spotted owl has been monitored in California and throughout the Sierra Nevada through general surveys, monitoring of nests and territorial birds, and on-going demography studies. Four demographic studies of California spotted owl (CSO) have been ongoing for a number of years within the Sierra Nevada: (1) Eldorado National Forest (since 1986); (2) Lassen National Forest (since 1990); (3) Sierra National Forest (since 1990); and (4) Sequoia-Kings Canyon National Park (since 1990). Managers typically view a population as stable if the 95% confidence interval of λ (the number of owls present in a given year divided by the number of owls present the year before) overlaps a value of 1. A value less than one indicates the population is decreasing and greater than 1 indicates an increasing population. For the California spotted owl demographic studies, recent analysis (Blakesley et al. 2010), using data collected between 1990 and 2005, provided the following estimate of mean λ for the Lassen study area: 0.973, with a 95% CI ranging from 0.946 to 1.001, which indicates a stable population. Additional clarification can be found in the Biological Evaluation for this project which contains more detailed information regarding California Spotted Owls.

Pacific Marten

Pacific marten has been monitored throughout the Sierra Nevada as part of general surveys and studies from 1996-2002 (Zielinski et al. 2005). Since 2002, the marten has been monitored on the Sierra Nevada forests as part of the Sierra Nevada Forest Plan Amendment (SNFPA) monitoring plan. Data at the rangewide, California, and Sierra Nevada scales indicates that marten appear to be distributed throughout their historic range, and their distribution has become fragmented in some areas of the southern Cascades and northern Sierra Nevada, particularly in Plumas County (USDA Forest Service, 2010). The primary concern regarding marten is maintaining the continuity and character of complex forests (dense canopy, multi-storied, snags, coarse woody debris). Moriarty (2014) found that marten concentrated use in complex patches of forest for foraging and acquisition of resources, while less complex patches were used infrequently for foraging bouts, and openings were used infrequently or avoided. Distribution appears to be continuous across high-elevation forests from Placer County south through the southern end of the Sierra Nevada although detection rates have decreased in some localized areas (e.g., Sagehen basin area of Nevada County) (USDA Forest Service, 2010).

Northern Flying Squirrel

The northern flying squirrel has been monitored and surveyed in the Sierra Nevada at various sample locations by live-trapping, ear-tagging, radio-telemetry, camera surveys, and snap-trapping:

- 2002 to present - Plumas and Lassen National Forests (Sierra Nevada Research Center 2007, 2008, 2009, 2010).
- 1958 to 2004 - Monitoring and study efforts throughout the Sierra Nevada.

These data indicate that northern flying squirrels continue to be present at these samples sites and that the distribution of northern flying squirrel populations in the Sierra Nevada is stable (USDA Forest Service, 2010).

Relationship of Project-level Effects to Bioregional-Scale Trend

As a result of the action alternatives, there would minimal expected change in populations or population trends for California spotted owls, Pacific marten, or northern flying squirrels, nor to the late-seral closed canopy habitat component with which they are associated. The current condition in the project area indicates that OSV use may be occurring in approximately 87.8% of the habitat component. However, due to the dense forested stands that make up this habitat component, most areas are expected to experience low OSV use except along existing roads and trails. Considering that vegetation management (tree removal or forest management) is not a part of the proposal, the complex nature of this habitat type is expected to remain intact and unaffected. Alternatives 2, 3 and 4 indicate an improvement over the current condition ranging between 0.5% (alt. 4) to 8.7% (alt. 3) by increasing the acreage where OSV use is prohibited. Given the small effects at the project level, the project would not alter the bioregional trend in the habitat component, nor would it lead to a change in the distribution of California spotted owls, Pacific marten, or northern flying squirrels across the Sierra Nevada bioregion.

Migratory Landbird Conservation

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. 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.

Likely impacts to habitats the migratory birds depend on have been assessed in further detail within the Biological Assessment (BA), Biological Evaluation (BE) and the Management Indicator Species (MIS) reports for the Lassen OSV Project. All reports found that effects to various habitats would be minimal to none considering that forested cover is not modified. Similarly, OSV use is concentrated between 12/26 and 3/31, which predominately avoids overlap with the active breeding season for most migratory bird species. The BA, BE, and MIS reports found that the Lassen OSV project would not cause adverse effects (BA), would not cause a trend toward a loss of viability (BE), nor would it degrade various MIS habitats to a level that affects trends in the Sierra Nevada bioregion. Also, potential impacts to migratory species are minimized through the adherence of LRMP Standards and Guidelines for snags/down woody debris, avoidance of streamside management zones, and no degradation in riparian areas and wetlands.

It is my professional finding that the Lassen OSV Project would have minimal impacts to individual migratory birds and would not adversely affect migratory landbird conservation. This finding is based on the results of analysis conducted in the BA, BE, and MIS reports, and that adherence to LRMP standards are incorporated into project design which in turn will maintain habitat diversity. The project meets the intent of the Migratory Landbird MOU.

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Appendix I. Wildlife Survey and Manage Species Analysis

Introduction

Forest-wide standards and guidelines for "Survey & 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 FS 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 northwest portion of the Hat Creek Ranger District. This report 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.

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/USDI 2001).

Project Description

The Forest Service proposes to designate National Forest System snow trails and areas on National Forest System land for public over-snow vehicle (OSV) use. These designations would occur on administrative units, or parts of administrative units or Ranger Districts of the Lassen National Forest where snowfall is adequate for that use to occur. These designations would be consistent with the requirements of Subpart C of the Forest Service's Travel Management Regulation at 36 Code of Federal Regulations (CFR) Part 212. The Forest Service would also identify snow trails to be groomed for public OSV use under the Lassen National Forest OSV trail grooming program. Refer to the Chapter 2 of the FEIS for alternative descriptions, comparisons, and maps.

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[1].

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.

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 1). According to NRIS, CNDDB, and Forest staff, there are no verified sighting of great gray owl on the Lassen National Forest.

[1] Based on information in USDA Forest Service and USDI Bureau of Land Management (2001), Bureau of Land Management (1999), and NatureServe (2014).

Table 1. Survey and Manage terrestrial wildlife species, categories A, C, and E

Scientific Name Common 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[2].	No	Yes

The 2001 ROD requires specific mitigation measures 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 1/4-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

Project Design Features

Minimizing Harassment of Wildlife

All Public OSV Use:

1. The objective of minimizing harassment of wildlife would be addressed by developing a public outreach program as part of this project to raise public awareness of winter wildlife habitat, wildlife behavior, and ways to minimize user impacts, as time and funds allow.

Public, Cross-country OSV Use:

1. The objective of minimizing impacts to wildlife would be addressed by ensuring that public OSV use is not occurring in areas not designated for public, cross-country OSV use.

Minimizing Significant Disruption of Wildlife Habitats

Groomed Snow Trails:

1. To address the objective of minimizing significant disruption of wildlife habitats, 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, withstand expected flood flows, and allow for free movement of resident aquatic life.

Public, Cross-country OSV Use:

1. The objective of minimizing impacts to wildlife would be addressed by ensuring that public OSV use is not damaging sensitive resource locations, in consultation with forest biologists. In particular, we will monitor public OSV use in sensitive wildlife habitats, in consultation with the forest biologist, to

[2] Assessed in the project Biological Evaluation

determine if adverse impacts re occurring. If adverse impacts are observed, changes in management would be considered in consultation with the forest biologist.

2. To address the objective of minimizing significant disruption of wildlife habitats, if public OSV use is found to be causing damage to Threatened, Endangered, Proposed, or Sensitive species or habitats, corrective actions would be required, including, but not limited to, area closures and signage to protect the sensitive resources.

3. To address the objective of minimizing impacts to gray wolf and their prey species, public OSV use would not be designated on approximately 50 percent of mule deer winter range under all alternatives.

4. To address the objective of minimizing significant disruption of wildlife habitats, the low risk of modification of the prey/food base from oil, gas, or other vehicle fluids entering waterways, cross-country OSV use would occur only when there is adequate snow cover to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality.

5. The objective of minimizing impacts to aquatic habitats would be addressed by prohibiting public OSV use on unfrozen lakes, reservoirs, ponds and any other open surface water.

6. In alternative 2 only, the objective of minimizing impacts to wildlife would be addressed by not designating areas around the west side of Eagle Lake for OSV use. There are osprey and eagle nests in that area. Under alternative 2 only, Eagle Lake would be completely buffered on National Forest System lands from OSV use.

Monitoring to Minimize Significant Disruption of Wildlife Habitats:

1. The objective of minimizing harassment of wildlife would 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.

2. To address the objective of minimizing 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 would be considered in consultation with the forest biologist.

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 mitigation measures[3] 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 34 – 37% 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

[3] Provide a no-harvest buffer of 300 feet around meadows and natural openings and establish 1/4-mile protection zones around known nest sites.

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.

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