

Plumas National Forest Over-snow Vehicle Use Designation Final Environmental Impact Statement

Volume I. Chapters 1 through 4 and References



Cover image: Snowmobiling at Round Valley Reservoir, Plumas National Forest, Plumas County, California. Photograph taken January 14, 2017, by Erika Brenzovich.

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Over-snow Vehicle Use Designation

Final Environmental Impact Statement

Plumas National Forest

Butte, Lassen, Plumas, Sierra, and Yuba Counties,
California

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

This final environmental impact statement (FEIS) discloses the comparative analysis of the options being considered in designating areas and trails of the Plumas National Forest for OSV use. We consider the environmental impacts of a proposed action, a no-action alternative, and three additional action alternatives developed in response to issues, public comments received during the scoping period; multiple interdisciplinary team discussions; coordination with project stakeholders; literature review; and application of the Minimization Criteria (36 CFR 212.55(b)(1-4)).

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Subject: Plumas OSV Objection

Objection period: The 45-day objection period starts the day after the Legal Notice to Object is published in the *Feather River Bulletin*.

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Summary of the Final Environmental Impact Statement

The Forest Service prepared this Final Environmental Impact Statement (FEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This FEIS discloses the environmental impacts that would result from the proposed action, a no-action alternative, and three additional action alternatives developed in response to the issues raised during scoping.

Purpose and Need

Based on the regulations for the management of over-snow vehicle (OSV) use on the National Forest System (NFS) lands (36 Code of Federal Regulations (CFR) Part 212, Subpart C and Part 261, Subpart A), the purposes of this project are to (1) provide a system of NFS snow trails and areas on NFS lands that are designated for over-snow vehicles use where snowfall is adequate for that use to occur and (2) comply with the Settlement Agreement between the Forest Service and *Snowlands Network et al.*, by designating NFS snow trails where grooming for public OSV use would occur.

The existing system of snow areas and trails open for public OSV use in the Plumas National Forest results from implementation of Plumas National Forest Land and Resource Management Plan (Forest Plan, USDA Forest Service 1988) management direction for OSV use. Current management is not consistent with the Travel Management Regulation – Subpart C.

Based on the stated purposes of this project, the interdisciplinary team identified the following needs for:

- Providing, designating, and effectively managing high-quality, public OSV access;
- Promoting the safety of all users;
- Minimizing impacts to natural and cultural resources;
- Minimizing conflicts between OSV use and other recreational uses on NFS and neighboring Federal lands;
- Minimizing conflicts between different vehicle classes on NFS and neighboring Federal lands; and
- Compatibility with the existing condition in populated areas, taking into account sound, emissions, and other factors.

Modified Proposed Action

The Forest Service proposes to designate NFS snow areas and trails on NFS land for public OSV use. These designations would occur on parts of administrative units or ranger districts of the Plumas 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 CFR Part 212. More details pertaining to the proposed action, described in alternative 2 - modified are provided below in Alternatives Considered in Detail and in chapters 1 and 2 of this document.

Significant Issues

Public participation and content analysis identified the significant issues listed in table S-1 and these issues were used to develop the action alternatives. The Issues section in chapter 1 provides additional

details regarding issue identification and how the information was used to inform other aspects of the planning process.

Table S-1. Significant issues

Issue Topic	Cause and Effect
1a. Availability of Motorized Over-snow Recreation Opportunities	<p>Designating areas and trails for OSV use has the potential to change recreation settings and opportunities by enhancing opportunities for motorized winter users in some areas and limiting those opportunities in other areas:</p> <ul style="list-style-type: none"> a) Eliminating popular, highly desirable areas that have been historically available for public, cross-country OSV use; b) Designating an insufficient quantity (miles and acres) of NFS trails and areas for public OSV use; and c) Providing an insufficient quantity (miles) of groomed public OSV opportunities.
1b. Availability of Non-motorized Over-snow Recreation Opportunities	<p>Public OSV use and grooming for public OSV use have the potential to impact the overall quality of the experience of users seeking solitude and a more quiet, non-motorized recreation experience:</p> <ul style="list-style-type: none"> a) Reducing the quantity of NFS land available for quiet, non-motorized recreation; b) Allowing OSV use within areas that currently emphasize non-motorized recreation including Semi-Primitive Areas, Proposed or Recommended Wild and Scenic Rivers, and Special Interest Areas; c) Increasing the area of overlap between non-motorized (e.g., snowshoeing, cross-country skiing, general snow play) and motorized (i.e., OSV) use; and d) Increasing the distance of travel required in order to access desirable quiet, non-motorized recreation areas (perhaps to distances further than an enthusiast is physically able to travel).
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences	<ul style="list-style-type: none"> a) Consuming untracked powder desired by non-motorized winter recreationists, particularly backcountry downhill skiers; b) Compacting, tracking, and rutting the snow, making the snow surface difficult and potentially unsafe for non-motorized users to cross-country ski, sled, snowshoe, or walk on; c) Creating a real or perceived risk of injury or mortality; d) Creating noise that may affect solitude and quiet recreational opportunities; and e) Impacting the scenery by reducing the amount of unaltered views.
2. Effects to Air Quality	<p>Designating areas and trails for public OSV use and grooming trails for public OSV use have the potential to generate exhaust and emit pollutants into the air. This has the potential to degrade the quality of the air. This potential degradation of air quality can impact recreational users, wildlife, and sensitive areas.</p>
3a. Effects to Terrestrial and Aquatic Wildlife	<p>The proposed OSV use designations and trail grooming have the potential to directly, indirectly, and cumulatively impact terrestrial and aquatic wildlife and plant species, including federally listed threatened and endangered species and their habitats by:</p> <ul style="list-style-type: none"> a) Causing injury or mortality to wildlife species through crushing (or other contact); b) Causing disturbance (e.g., increased noise and human presence resulting in interrupted or lost breeding or feeding opportunities, or movement patterns); c) Causing habitat destruction or modifications through rutting of the underlying habitat, road or trail, which could result in sediment delivery during the subsequent runoff season. d) Spilling or leaking of fuels or oils from OSVs could cause stream contamination at stream crossings; and e) Causing the zone of potential impacts to broaden by designating OSV-use areas rather than restricting OSV use to designated trails.

Issue Topic	Cause and Effect
3b. Effects to Botanical Resources	<p>The proposed OSV use designations and trail grooming have the potential to directly, indirectly, and cumulatively impact plant species, including federally listed threatened and endangered species and their habitats by:</p> <ul style="list-style-type: none"> a) Causing injury, loss of vigor or mortality to plant species through compacting snow and crushing of TES plants; b) In designated OSV-use areas, mid-story vegetation is vulnerable to damage caused by OSV use, and mid-story vegetation damage may impact TES plant habitat; c) Designating areas and trails for public OSV use and grooming trails for public OSV use could also adversely impact botanical resources within research natural areas (RNAs) and special interest areas (SIAs).

Alternatives Considered in Detail

The action alternatives (alternatives 2 - modified through 5) and the no-action alternative (alternative 1) are considered in detail. Complete details of the alternatives, including monitoring, are found in chapter 2 of this document. The four action alternatives and a no-action alternative considered are discussed in more detail in chapter 2 and laws, regulations, policies, and Forest Plan topics are provided in appendix B.

The proposed action (alternative 6) as it appeared in the Notice of Intent of 2015, was dropped from detailed analysis, and replaced by the modified proposed action (alternative 2 - modified). Alternative 6 was retained in the tables and descriptions within chapters 1 and 2 of this FEIS for comparison purposes, but was not analyzed in detail, and therefore, is not discussed in chapters 3 and 4.

Alternative 1: No Action (Continued Current Management)

Alternative 1 (no action) is required by the implementing regulations of the NEPA and serves as a baseline for comparing the alternatives. Under alternative 1, there would be no change to the way the Forest Service currently manages public OSV use in the Plumas National Forest. Therefore, if selected, 1,147,825 acres of NFS lands and 2,879 miles of unmarked, ungroomed, underlying roads and trails are within designated OSV-use areas. Approximately 227 miles of trails available for OSV use and 203 miles of trails are groomed. The Forest Plan does not establish a minimum snow depth for cross-country or trail use and no Pacific Crest Trail (PCT) crossings are designated. Seventy-nine miles of the Pacific Crest Trail cross the Plumas National Forest administrative boundary from the Lassen to the Tahoe National Forests. Almost 18 miles of the PCT overlie designated wilderness or special areas, leaving just over 61 miles of PCT to evaluate the purpose and nature of the trail and use of over-snow vehicles. Minimum snow depth for grooming occurs at 12 inches. Although public cross-country OSV travel would be available, alternative 1 does not (1) designate a system of OSV trails or areas as directed by Subpart C of the Final Travel Management Rule (36 CFR 212), and (2) identify the location of, or analyze the effects of, groomed trails.

Alternative 2 - Modified

Alternative 2 - modified is the preferred alternative. Alternative 2 – modified strives to balance the availability of motorized and non-motorized over-snow recreational opportunities and minimization of impacts to natural and cultural resources. Alternative 2 - modified includes the designation of seven cross-country OSV-use areas (858,436 acres) and 226 miles of trails for OSV use where 143 miles would be groomed and 83 miles would be ungroomed. There are 2,753 miles of undesignated, unmarked, ungroomed, underlying roads and trails within designated OSV use areas. Alternative 2 - modified proposes a minimum snow depth requirement of 12 inches within the designated cross-country OSV-use areas; 6 inches along designated OSV trails; and 12 to 18 inches along designated groomed trails

(consistent with California Snowmobile Grooming Standards). Specific to the PCT, Areas not designated for OSV use adjacent to the PCT occur when the PCT overlies undesignated NFS lands or when NFS roads and/or motorized trails intersect, crisscross, or parallel the PCT. Undesignated NFS lands do not authorize OSV use and an additional area not designated for OSV use is not necessary. NFS roads and/or motorized trails that intersect, crisscross, or parallel the PCT within the previous 500-foot area not designated for OSV use originally proposed in the proposed action affects the nature and purpose of the PCT in the non-winter months. An area not designated for OSV use is applied at Bucks Summit, a congested, high-use staging area; the eastern side of the Middle Fork Wild and Scenic River to provide a noise buffer; and from the general area of Onion Valley to McRae Ridge to include the preservation of historic ski trails. Alternative 2 – modified would designate 12 OSV trails where motorized routes on the Plumas Motorized Vehicle Use Map (MVUM) cross the PCT and 4 OSV trails along the shared Plumas and Tahoe National Forests administrative boundary that are not existing motorized routes and their width would range up to 0.25 mile.

Alternative 3

Alternative 3 is a detailed alternative submitted during the public scoping period. Components of this alternative would address significant issues and concerns relating to 1b) availability of non-motorized over-snow recreation opportunities; 1c) quality of motorized and non-motorized over-snow recreational experiences; and 2) effects to air quality. In response to this issue, this alternative proposes to preserve the non-motorized, semi-primitive setting of Inventoried Roadless Areas, NFS land adjacent to the Bucks Lake Wilderness, Wild Zone of the Middle Fork Feather River Wild and Scenic River, Semi-Primitive Areas, Special Interest Areas, and Research Natural Areas by not designating OSV-use areas or trails within these NFS lands. Alternative 3 proposes to designate approximately 257,804 fewer acres than alternative 2 - modified, less than any other action alternative, to maintain or preserve areas historically used by non-motorized winter users and wildlife habitat.

Alternative 3 proposes to designate approximately 600,542 acres of designated OSV-use areas and 220 miles of groomed trails for OSV use. There are 1,499 miles of undesignated, unmarked, ungroomed, underlying roads and trails within designated OSV-use areas. Alternative 3 proposes increasing the minimum snow depth for cross-country OSV-use trails to 18 inches and 12 inches for groomed OSV trails. Specific to the PCT, an area adjacent to the PCT would not be designated for cross-country OSV travel to minimize noise disturbance to non-motorized recreationists on the PCT, and to retain the non-motorized characteristics of this national scenic trail. Areas where the PCT is in close proximity to designated OSV trails available for grooming would be designated for OSV use. Alternative 3 proposes to designate nine OSV trails where motorized routes on the Plumas MVUM cross the PCT and where trail 12E39 joins the PCT (west of Gold Lake).

Alternative 4

Alternative 4 is a detailed alternative submitted by Blue Ribbon Coalition and Sierra Access Coalition in accordance with the settlement agreement in the case of *Snowlands Network et al. v. U.S. Forest Service* during the public scoping period. Components of this alternative would address one significant issue and concerns relating to the availability of motorized over-snow recreation opportunities. In response to this issue, this alternative proposes to designate approximately 350 additional miles of designated and groomed OSV trails than alternative 2 and approximately 302,449 more acres of designated cross-country OSV areas, more than any action alternative, to maintain areas historically used by motorized winter users and provide a quality OSV trail network.

Alternative 4 proposes to designate approximately 1,160,793 acres of OSV-use areas and 577 miles of groomed trails for OSV use. There are 2,610 miles of undesignated, unmarked, ungroomed, underlying roads and trails within designated OSV-use areas. Alternative 4 proposes a minimum snow depth requirement of 12 inches in designated cross-country OSV areas, and no minimum would be applied to designated OSV trails with or without grooming. Specific to the PCT, areas adjacent to the PCT would be designated for cross-country OSV travel and would not include an area not designated for OSV use. Alternative 4 would designate 31 OSV trails where motorized routes on the Plumas MVUM cross the PCT and 6 OSV trails along the shared Plumas and Tahoe National Forests' administrative boundary that are not existing motorized routes and their width would range up to 0.25 mile. This alternative includes designation of cross-country OSV use adjacent to the PCT.

Alternative 5

Alternative 5 is a detailed alternative submitted during public comments and further modified by the interdisciplinary team. This alternative addresses significant issues and concerns of 1b) availability of non-motorized recreation; 1c) quality of motorized and non-motorized recreation experiences; 2) effects to air quality; and 3a and 3b) effects to terrestrial and aquatic wildlife and botanical resources. In response to these issues, this alternative proposes to designate approximately 206,470 fewer acres of cross-country OSV areas and 17 fewer miles of designated and groomed OSV trails than alternative 2 - modified to preserve NFS lands in alternative 3 and maintain areas historically used by motorized and non-motorized winter users. Alternative 5 also includes enhanced restrictions to designated OSV trails and cross-country areas to protect bald eagle primary use areas and northern goshawk protected activity centers (PAC).

Alternative 5 proposes to designate approximately 651,876 acres of OSV-use areas and 210 miles of groomed trails for OSV use. There are 1,660 miles of undesignated, unmarked, ungroomed, underlying roads and trails within designated OSV-use areas. Alternative 5 proposes a minimum snow depth requirement of 24 inches within the designated cross-country OSV-use areas; 12 inches along designated OSV trails; and 12 to 18 inches along designated groomed trails. Specific to the PCT, an area within 500 feet of centerline of the PCT would not be designated for cross-country OSV travel to minimize noise disturbance to non-motorized uses on the PCT and to retain the non-motorized characteristics of this national scenic trail. OSV use across the PCT would be restricted to designated OSV trails only. Alternative 5 would designate 24 OSV trails where motorized routes on the Plumas MVUM cross the PCT and have a width of 14 feet.

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Table S-2. Comparison of alternatives

	Alternative 1 No Action (Current Management)	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5	Alternative 6** Proposed Action (2015)
NFS lands within the Plumas National Forest - acres	1,204,750	1,204,750	1,204,750	1,204,750	1,204,750	1,204,750
OSV Use Designations						
Allowed OSV Use (% of total NFS lands):	95%	71%	50%	96%	54%	97%
* Designated Areas – acres*	1,147,825***	858,436	600,542	1,160,793	651,877	1,162,000
-- Miles of unmarked, non-designated trails available within designated OSV-use areas	2,879	2,753	1,499	2,610	1,660	
* Designated Trails – total miles	227	226	220	577	210	276
-- Available for Grooming – miles existing	203	143	200	141	209.6	203
-- Available for Grooming – miles newly proposed	0	0	73	436	0.45	73
-- Not Available for Grooming* - miles	24	83	0	0	5.2	0
Minimum Snow Depth for Off-Trail, Cross-Country OSV Use	None	12	18	12	24	12
Minimum Snow Depth for OSV Use on Designated Trails	None	6	18	None	12	None
Minimum snow Depth for Grooming of trails - inches	12-18	12-18	12	None	12-18	12-18
Areas Designated for OSV use – acres*						
Antelope	135,048	115,944	93,098	135,290	96,002	Did not specify
Bucks	243,237	136,876	65,607	243,964	65,373	Did not specify
Canyon	88,960	58,009	16,395	91,740	21,105	Did not specify
Davis	177,218	138,493	113,425	181,118	124,249	Did not specify
Frenchman	277,225	263,958	223,980	278,044	256,991	Did not specify
Lakes Basin	46,729	33,480	25,701	46,897	26,757	Did not specify
La Porte	179,407	111,676	62,336	183,742	61,399	Did not specify
Pacific Crest Trail Crossings						
Number of crossings	0	16	9	31	16	24
Crossings on roads/trails	-	12	9	25	16	-
Linear crossings not associated with a road/trail	-	4	0	6	0	-

*All area size estimates are approximate and are rounded to the nearest whole number.

**Alternative 6 (Proposed Action, 2015) is not carried forward for detailed analysis. It is replaced with alternative 2 - modified

***There are no areas “designated for OSV use.” OSV use is currently allowed on 1,147,825 acres.

Chapter 1. Purpose of and Need for Action

Document Structure

The Forest Service has prepared this final environmental impact statement (FEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This FEIS discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four chapters with appendices:

- **Chapter 1. Purpose and Need for Action:** This chapter briefly describes the modified proposed action, the need for that action, and other purposes to be achieved by the proposal. This section also details how the Forest Service informed the public of the proposed action and how the public responded.
- **Chapter 2. Alternatives:** This chapter provides a detailed description of the agency's modified proposed action as well as alternative actions that were developed in response to comments raised by the public during scoping. The end of the chapter includes a summary table comparing the modified proposed action and alternatives with respect to their environmental impacts.
- **Chapter 3. Affected Environment and Environmental Consequences:** This chapter describes the environmental impacts of the modified proposed action and alternatives.
- **Chapter 4. Consultation and Coordination:** This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement.
- **Appendices.** The appendices provide more detailed information to support the analyses presented in the environmental impact statement.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Plumas National Forest Supervisor's Office in Quincy, California.

This document incorporates by reference the 1988 Plumas National Forest Land and Resource Management Plan (Forest Plan, USDA Forest Service 1988), as amended by the 2004 Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement and Record of Decision; and the 2010 Over Snow Vehicle Program Final Environmental Impact Report, Program Years 2010 – 2020, by the State of California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation (OHMVR) Division (California Department of Parks and Recreation, Off Highway Motor Vehicle Recreation Division 2010).

Background

This analysis responds to requirements in the Federal regulations for the management of OSV use on national forests (36 CFR Part 212, Subpart C), as well as a settlement agreement in the case of *Snowlands Network et al. v. U.S. Forest Service* (Case No. 2:11-cv-02921-MCE-DAD, E.D. Cal.).

Travel Management Regulations – Subpart C: “Use by Over-snow Vehicles”

The Forest Service published its final rule for Subpart C of the Forest Service’s Travel Management Regulations (36 CFR Part 212) in the Federal Register on January 28, 2015 (80 FR 4500). The rule became effective on February 27, 2015. The final rule revised 36 CFR 212.80(a)(Purpose) reads as follows:

This subpart [Subpart C] provides for a system of National Forest System roads, National Forest System trails, and areas on National Forest System lands that are designated for over-snow vehicle use. After these roads, trails, and areas are designated, over-snow vehicle use not in accordance with these designations is prohibited by 36 CFR 261.14. Over-snow vehicle use off designated roads and trails and outside designated areas is prohibited by 36 CFR 261.14.

The final rule revised 36 CFR 212.81(a) reads as follows:

Over-snow vehicle use on National Forest System roads, on National Forest System trails, and in areas on National Forest System lands shall be designated by the Responsible Official on administrative units or Ranger Districts, or parts of administrative units or Ranger Districts, of the National Forest System where snowfall is adequate for that use to occur, and, if appropriate, shall be designated by class of vehicle and time of year...

Subpart C of the Travel Management Regulations require that, designated public OSV areas and trails shall be identified on a publicly available OSV-use map (OSVUM)[(36 CFR 212.81(c))]. Once issued, designations would be made enforceable under 36 CFR 261.14, which prohibits the possession or operation of an OSV on NFS lands other than in accordance with the Subpart designations, subject to the exceptions listed at 36 CFR 261.14(a-f).

Designation Criteria

The Travel Management Regulations set forth designation criteria that are to guide the responsible official’s designation of areas and trails for OSV use (see 36 CFR §212.55(a-e¹) and FEIS, appendix B). These criteria delineate certain elements and resources, the effects on which the responsible official must consider.

The Travel Management Regulations describe the general designation criteria (36 CFR 212.55(a)) as follows:

In designating National Forest System roads, National Forest System areas and trails 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.

¹ Subpart C of the Travel Management Regulations incorporates the designation criteria found at 36 CFR §212.55 along with certain other requirements found in Subpart B. Specifically, 36 CFR §212.81(d) provides that: “the requirements governing designation of National Forest System roads, National Forest System trails, and areas on National Forest System lands in §§212.52 (public involvement), 212.53 (coordination), 212.54 (revision), 212.55 (designation criteria (including minimization)), and 212.57 (monitoring), shall apply to decisions made under [Subpart C]”

The Travel Management Regulations describe the specific designation criteria (36 CFR 212.55(b)) as follows:

In addition to the criteria in paragraph (a) of this section, in designating National Forest System areas and trails 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.*

Additionally, 36 CFR 212.55(d) requires the responsible official to recognize:

- 1) Valid existing rights; and*
- 2) The rights of use of National Forest trails of access in designating trails and areas for OSV use.*

And 36 CFR 212.55(e) provides that:

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 ...unless, in the case of wilderness areas, motor vehicles use is authorized by the applicable enabling legislation for those areas.

Minimization Criteria

The term “minimization criteria,” as used throughout this document, refers to the subset of the specific criteria which the responsible official is to consider “with the objective of minimizing” the four categories of impacts set forth in 36 CFR §212.55(b)(1)-(4).

The process of considering the effects of designating trails and areas for OSV use with the objective of minimizing the four categories of impacts set forth at 36 CFR 212.55(b)(1-4) is referred to as “applying the minimization criteria” (see Applying the Minimization Criteria and Other Specific Criteria section in chapter 2).

The Travel Management Regulations implement Executive Order 11644 (E.O. 11644), as amended by Executive Order 11989 (1977), from which the minimization criteria originate. E.O. 11644 states that “each respective agency head shall develop and issue regulations and administrative instructions... to provide for administrative designation of the specific areas and trails on public lands on which the use of off-road vehicles may be permitted...” (emphasis added). This supports

the application of the minimization criteria to each specific area and trail. The Ninth Circuit Court of Appeals has further clarified this point:

[T]he TMR requires the Forest Service to apply the minimization criteria to each area it designated for snowmobile use.... [T]he Forest Service must apply the data it has compiled to show how it designed the areas open to snowmobile use ‘with the objective of minimizing’ [the impacts set forth in 36 CFR 212.55(b)(1-4)]....[T]he Forest Service cannot rely upon a forest-wide reduction in the total area open to snowmobiles as a basis for demonstrating compliance with the minimization criteria. The TMR is concerned with the effects of each particularized area and trail designation. The minimization criteria must be applied accordingly.” WildEarth Guardians v. USFS, No. 12-35434, D.C. No. 9:10-cv-00104-DWM, 9th Circuit Court of Appeals, 6/22/15, pp. 23 and 27 (emphasis in original).

However, the court clarified that the requirement to apply the minimization criteria to each area and trail designated for OSV use² does not require the agency to complete a separate environmental review for each area and trail designated for uses.

Our conclusion does not require the Forest Service to conduct an entirely separate environmental review for each area and trail it designates for snowmobile use. The TMR does not prevent the Forest Service from conducting an analysis of multiple areas and trails at once, nor from integrating NEPA and TMR compliance into a single process....What is required is that the Forest Service document how it evaluated and applied the data on an area-by-area basis with the objective of minimizing impacts as specified in the TMR. WildEarth Guardians v. USFS, No. 12-35434, D.C. No. 9:10-cv-00104-DWM, 9th Circuit Court of Appeals, 6/22/15, pp. 23 and 27

It is also important to note that applying the minimization criteria should not be interpreted as strictly requiring the prevention of all impacts. Instead, in applying the minimization criteria, the Forest Service maintains the flexibility to manage for reasonable reduction of impacts while still addressing the need to provide trails and areas for public OSV experiences. This point is clarified in the preamble to the Travel Management Regulations Final Rule published on November 9, 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 areas and trails 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).*

Consistent with these authorities, the Forest Service has applied the minimization criteria as documents in chapter 2 and in appendices D and E.

Applying the General Designation Criteria

The general designation criteria (36 CFR 212.55(a)) were applied in the development of the proposed action and discussed within the effects analysis. The effects of the action alternatives on NFS natural and cultural resources, public safety, provisions of recreational opportunities, conflicts among uses of NFS lands, access needs, and maintenance and administration of NFS lands, were

² The Court characterized this requirement as “a more granular minimization analysis” than what had been done in the Subpart C designations at issue in that case. 790 F.3d at 931.

each specifically considered during application of the minimization criteria (see chapter 2 and appendices D and E) and development of the action alternatives. The analysis contained in chapter 3 analyzes the effects on natural and cultural resources, public safety, provision of recreation opportunities, access needs, conflicts among uses of National Forest System lands, the need for maintenance and administration of areas and trails that would arise if the uses under consideration are designated, and the availability of resources for maintenance and administration of OSV designations. By including a range of activities in size, space, and proximity to other potentially effects resources, each action alternative provides a range designated OSV trails, areas, and grooming.

Applying the Minimization Criteria and Other Specific Designation Criteria

To apply the minimization criteria (36 CFR 212.55(b)(1-4)) and the other specific criteria for designating trails and areas for OSV use (“Specific Designation Criteria”)(36 CFR 212.55(b)(5); (d); and e)) the Forest Service conducted a minimization criteria screening exercise that included four steps. Chapter 2 provides a more detailed description of the minimization criteria screening exercise.

Results of this exercise helped identify potential impacts and conflicts that may occur as a result of designating OSV trails and areas. The exercise resulted with the OSV trails and areas proposed in one or more action alternatives.

Applying the Rights of Access Designation Criteria

As required by 36 CFR 212.55(d), the proposed OSV-use area and trail designations included in this FEIS would not violate any valid existing rights or the rights of use (entering and exiting) of NFS lands and trails by actual settlers and other persons residing within the national forests (or other areas administered by the Forest Service) in order to reach their homes and to utilize their property (36 CFR 212.6(b)).

Applying the Wilderness Areas and Primitive Areas Designation Criteria

As required by 36 CFR 212.55(e), no trails or areas are proposed to be designated for OSV use in Wilderness and Primitive Areas in this FEIS.

Consistency with Area Size Definition

An area as defined in the Travel Management Final Rule at 26 CFR 212.1 states that:

An area is a discrete, specifically delineated space that is smaller, and except for OSV use, in most cases much smaller than a Ranger District.

The seven OSV-use areas proposed for designation in one or more action alternatives are smaller than all ranger districts in the Plumas National Forest, ranging in size from 16,395 acres to 278,044 acres. Each OSV-use areas’ acres are summarized in Table S-2.

Terms of the Settlement Agreement

Terms of the Settlement Agreement require the Forest Service to:

- Analyze ancillary activities such as the plowing of related parking lots and trailheads as part of the effects analysis;
- Consider a range of alternative actions that would result in varying levels of OSV use; and

- Consider an alternative submitted by Plaintiffs and/or Interveners in the NEPA analysis, so long as the alternative meets the purpose and need, and is feasible and within the scope of the NEPA analysis, and Plaintiffs and/or Interveners provide the Forest Service with a detailed description of that alternative during the scoping period for the NEPA analysis.

Scope of this Action

This action would manage the use of OSVs on NFS lands. An OSV is defined in the Forest Service's Travel Management Regulations as "a motor vehicle that is designed for use over snow that runs on a track or tracks and/or ski or skis, while in use over snow" (36 CFR 212.1, see appendix K of this FEIS).

The Plumas National Forest Over-snow Vehicle Use Designation Project is not intended to be a comprehensive, holistic winter recreation planning effort. The decision resulting from this analysis would designate areas and trails for public OSV use in accordance with Subpart C in the Plumas National Forest.

As with the evaluation of areas, roads, and trails for other types of motorized vehicle use (i.e., Subpart B), the requirements governing designation of NFS roads and trails, and areas on NFS lands as described in Subpart B at 36 CFR 212.52 (public involvement); 36 CFR 212.53 (coordination with Federal, State, County, and other local government entities and tribal governments); 36 CFR 212.55 (designation criteria, including minimization criteria); 36 CFR 212.56 (OSVUM); and 36 CFR 212.57 (monitoring) shall apply to decisions made as a result of the Plumas National Forest Over-snow Vehicle Use Designation Project under Subpart C of the Final Travel Management Rule (36 CFR Part 212) pursuant to 36 CFR 212.81(d) of the final rule.

The following uses of OSVs would be exempt from these designations and the prohibition in 36 CFR 261.14(a-f):

- a. Limited administrative use by the Forest Service;
- b. Use of any fire, military, emergency, or law enforcement vehicle for emergency purposes;
- c. Authorized use of any combat or combat support vehicle for national defense purposes;
- d. Law enforcement response to violations of law, including pursuit;
- e. Over-snow vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations [such as for managing permitted livestock or for access under a special use permit (36 CFR 212.81(a))]; and
- f. Use of a road or trail that is authorized by a legally documented right-of-way held by a state, county, or other local public road authority (36 CFR 261.14).

Not all existing NFS OSV areas and trails on NFS lands would be designated for public OSV use. With certain limited exceptions, the agency recognizes no need to designate OSV trails, only identify them, in areas that would be designated for cross-country OSV use. It would not be necessary to designate an ungroomed OSV trail where OSV use would not be confined to the trail. However, to address requirements in the Settlement Agreement with *Snowlands Network et al.*, groomed OSV trails located in areas designated for cross-country OSV use would be analyzed.

With respect to the identification of groomed OSV trails, there are annual uncertainties and financial limitations on the miles and frequency of grooming within the Forest's OSV trail grooming program. This is because the Forest Service's current grooming program in the Plumas National Forest is

funded by the State of California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation (OHMVR) Division. Current funding allows the Forest Service to mechanically groom approximately 203 miles of trails in its OSV trail grooming program for the Plumas National Forest. This funding is not likely to substantially increase in future years. Therefore any additional miles of groomed trails identified in this analysis would be groomed if funding were available.

Grooming of trails, for which the Forest Service has no legal jurisdiction (e.g., State or county roads), does occur, and is included in all alternatives. The Forest Service grooms these trails under authorizations from the governing, non-Federal entity of those trails. Although the Forest Service has authorization to groom these trails for public OSV use, the Forest Service has no authority to designate these trails as NFS OSV use trails in the record of decision for this project. Despite not being designated, the groomed non-jurisdiction trails located within the administrative boundary of the Plumas National Forest will be displayed on the OSVUM produced as a product of the decision for public convenience.

Managing the use of wheeled, motorized vehicles or bicycles is not within the scope of this action. Other types of motor vehicles that may operate over snow, but that do not meeting the definition of an OSV, are managed under Subpart B of the Travel Management Regulations. Routes and areas for these types of vehicles were previously designated and these designations have been published on a motor vehicle use map as the result of a separate environmental analysis and decision (USDA Forest Service 2010).

The decision resulting from this analysis would not designate NFS roads for public OSV use. Public OSV trails that would exist on snow overlying existing NFS roads would be designated as NFS trails where public OSV use is designated.

Non-motorized winter recreation opportunities and uses will be considered in this analysis in terms of the effects that designating snow trails and areas for public OSV use may have on non-motorized recreation opportunities.

The decision will be implemented immediately upon the issuance of the signed record of decision (ROD), which is expected March 2020. Creating and publishing the OSVUM is the first part of implementing the ROD. The OSVUM will be formatted similar to the existing MVUM for wheeled vehicles in the Plumas National Forest. Once the ROD is signed and OSV use designations have been identified on the OSVUM, it is prohibited to possess or operate an OSV on NFS lands in that administrative unit or ranger district other than in accordance with those designations. Enforcement of the ROD is reliant on the creation and availability of the OSVUM.

Project Location

The Plumas National Forest Over-snow Vehicle Use Designation Project includes all of the NFS lands within the Plumas National Forest (figure 1), in Butte, Lassen, Plumas, Sierra, and Yuba Counties, California. Not all NFS lands would be designated for public OSV use, and this project does not include wilderness areas or private, State, or other Federal land ownership.

Land status (i.e., ownership and administrative boundary) is correct as of June 2017. Subsequently, land may be acquired or exchanged. Any acquired lands would be managed in accordance with the management prescriptions for the area within which they occur.

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Chapter 1. Purpose of and Need for Action

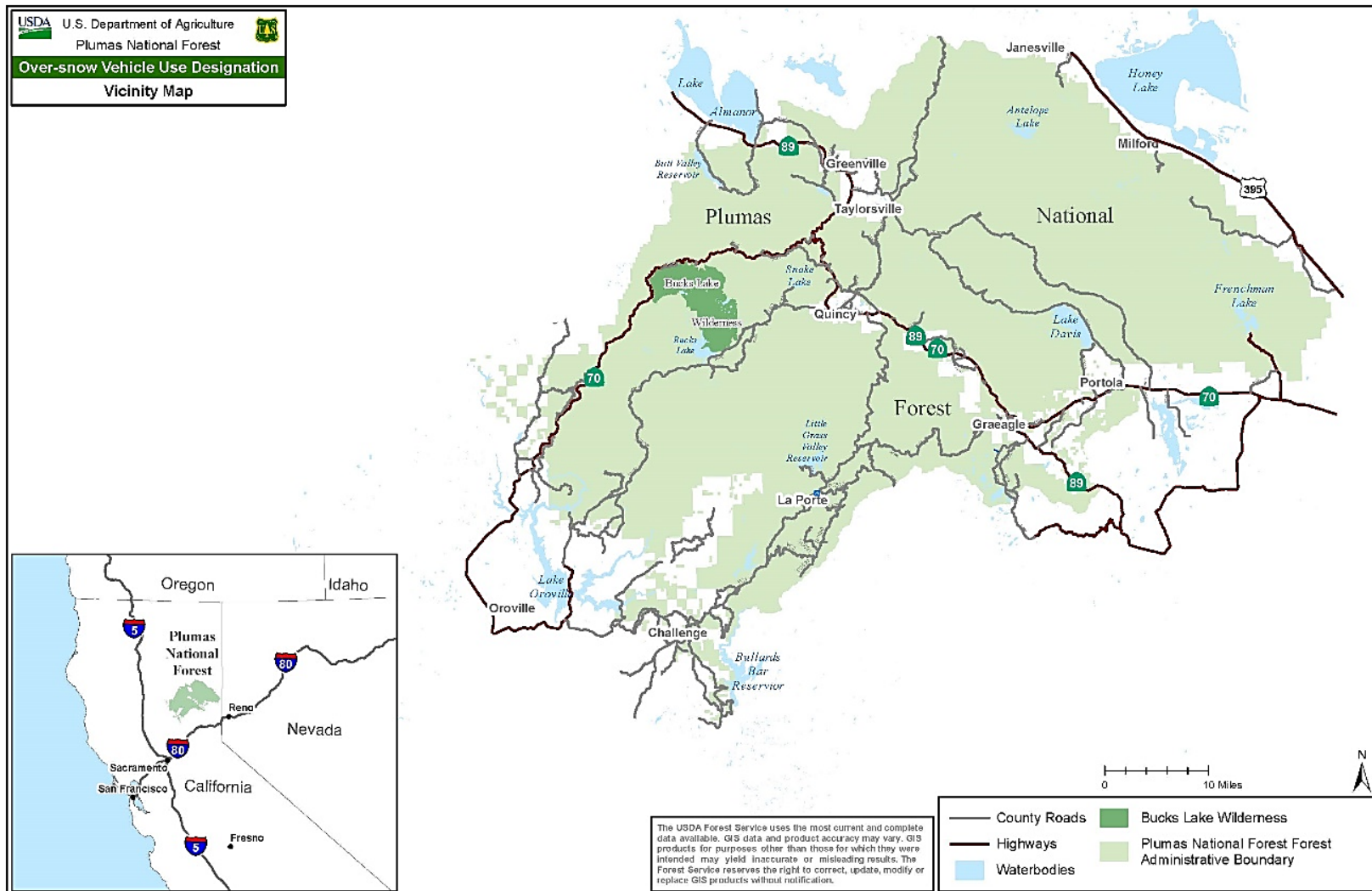


Figure 1. Vicinity map

Purpose of and Need for Action

Based on the regulations for the management of over-snow vehicle (OSV) use on the National Forest System (NFS) lands (36 CFR Part 212, Subpart C and Part 261, Subpart A), the purposes of this project are to (1) provide a system of NFS snow trails and areas on NFS lands that are designated for over-snow vehicles use where snowfall is adequate for that use to occur, and (2) comply with the Settlement Agreement between the Forest Service and *Snowlands Network et al.*, by designating NFS snow trails where grooming for public OSV use would occur.

The existing system of snow areas and trails open for public OSV use in the Plumas National Forest results from implementation of Forest Plan management direction for OSV use. Current management is not consistent with the Travel Management Regulation – Subpart C.

Based on the stated purposes of this project, the interdisciplinary team identified the following needs for:

- Providing, designating, and effectively managing high-quality, public OSV access;
- Promoting the safety of all users;
- Minimizing impacts to natural and cultural resources;
- Minimizing conflicts between OSV use and other recreational uses on NFS and neighboring Federal lands;
- Minimizing conflicts between different vehicle classes on NFS and neighboring Federal lands; and
- Compatibility with the existing condition in populated areas, taking into account sound, emissions, and other factors.

Modified Proposed Action

Based on internal review, public scoping comments, public comments on the DEIS, and consideration of minimization criteria, the Forest Service modified its original proposed action (2015, alternative 6). The Forest Service proposes to designate NFS snow areas and trails on NFS land for public OSV use. These designations would occur on parts of administrative units or ranger districts of the Plumas 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 CFR Part 212. More details pertaining to the proposed action, described in alternative 2 - modified are provided below in Alternatives Considered in Detail and in chapters 1 and 2 of this document.

Decision Framework

The Plumas National Forest Supervisor is the responsible, deciding official who may decide to: (1) select the proposed action; (2) select one of the alternatives; (3) select one of the alternatives with further modifications and/or mitigation measures; (4) select a combination of actions proposed in any alternative analyzed; or (5) select the no-action alternative, choosing not to authorize the Plumas National Forest Over-snow Use Designation Project.

Public Involvement

Public participation is important throughout the planning process and critical at numerous points during the analysis. The Forest Service seeks information, comments, participation from Federal,

State, and local agencies and individuals or organizations that may be interested or affected by the proposed action.

A pre-scoping meeting was held on November 6, 2014, in Quincy, California, which was attended by interested and affected stakeholders. Those in attendance included individuals, agencies, and winter recreation groups. The meeting's objectives were to share information about the project and the NEPA process, gather input on public engagement and confirm and collect public input on a preliminary purpose and need for action through shared concerns and solutions with current OSV management on each forest. The meeting was attended by 72 people. A more detailed description of this meeting and outcomes are included in the December 2014 Pre-NEPA meeting summary report, available in the project record.

The project first appeared in the Plumas National Forest Schedule of Proposed Actions (SOPA) in July 2015. The SOPA is available on the Internet at <https://www.fs.fed.us/sopa/forest-level.php?110511>.

Public Scoping Period (60 days) and the Notice of Intent

The Forest Service conducts scoping according to the Council on Environmental Quality regulations (40 CFR 1501.7). In addition to other public involvement, scoping initiates an early and open process for determining the scope of issues to be addressed in the EIS and for identifying the significant issues related to a proposed action. This scoping process allows the Forest Service not only to identify significant environmental issues deserving study, but also deemphasizes insignificant issues, narrowing the scope of the EIS process accordingly (40 CFR 1500.4(g)).

A scoping letter describing the proposed action and seeking public comments was sent via regular mail or email to approximately 278 interested groups, individuals and agencies on September 28, 2015, with comments requested to be returned by October 29, 2015. A notice of intent to prepare an environmental impact statement was published in the Federal Register on September 29, 2015. Two additional notices were sent, extending the scoping comment deadline, and making minor corrections to the scoping notice, with the final comment period deadline of November 30, 2015. Several press releases were sent to local news media outlets announcing the opportunity to comment, and extensions of the comment period. In addition, five public scoping meetings were held in local affected communities. All letters, notices, and press releases included a web address for the project's website where comments could also be submitted.

During October and November 2015, alternative 6, the first iteration of the proposed action was presented in a series of public meetings in communities surrounding the Plumas including Quincy, Portola/Graeagle, Oroville, and Sierra Ci. The meetings were held to inform members of the public about the Plumas National Forest Over-snow Vehicle Use Designation Project and for the Forest to hear from the public about their interests and concerns regarding OSV use. This information was used to help refine the initial proposed action (alternative 6). Information gathered included:

- Areas and trails identified as desirable by OSV enthusiasts;
- Areas and trails identified as desirable by quiet, non-motorized recreation enthusiasts;
- Concerns related to impacts to non-motorized recreation;
- Concerns related to OSV access and connectivity; and
- Concerns related to forest resources (e.g., wildlife, soil, water, vegetation)

Based on the concerns expressed during the public meetings, the proposed action was further refined prior to scoping. The proposed action advertised (scoped) in September 2015, was a compilation of the Forest Service's efforts, as well as, public input.

We received and considered responses from 190 interested groups, individuals, and agencies in the form of letters, emails, and website submissions (appendix H). We appreciate the time and perspectives shared by each commenter, and the willingness of all to engage in the environmental analysis process.

Forest staff met with the Plumas County Coordinating Council OSV subcommittee on 14 occasions between March 5, 2015, and June 9, 2016, to brief them on the purpose and need and the overall analysis process. The subcommittee met with the local recreation groups on three occasions in 2016 (May 13, May 20, and May 26) to understand the various positions and bring together any common recommendations related to the proposed action or alternatives. These meetings ended with agreement regarding the definition of OSV crossings for the Pacific Crest National Scenic Trail (PCT): "adequate crossings along the PCT wide enough for changing conditions for motorized uses, as long as motorized access is designated on each side of PCT, while maintaining historic routes."

Letters dated November 10, 2015, were received from the plaintiffs and intervenors from the *Snowlands* lawsuit, describing their preferred alternatives. Follow-up letters were sent to both the plaintiffs and intervenors on May 31, 2016, requesting clarification of the alternative components that had been submitted and informing them of the components of their requests that were believed to be outside of the scope of this project. The plaintiffs and intervenors sent letters of response to the Forest Service dated June 28, 2016, and June 20, 2016, respectively.

We met with representatives of the plaintiffs (April 27, 2016) and local recreation groups (Friends of Plumas Wilderness, May 13, 2016, and Sierra Access Coalition, May 19, 2016) to clarify their alternative submissions and discuss overall project status.

In July 2018, we contacted the plaintiffs to disclose that the National Bald Eagle Guidelines were inconsistent with the Forest Plan, which contains a bald eagle habitat prescription that applies to occupied and potential bald eagle habitat. The prescription includes area of (1) historical nesting territories, (2) suitable habitat for population expansion, and (3) foraging and roosting habitat. The National Bald Eagle Guidelines prescribe a 660-foot buffer around nest sites only. The plaintiffs were amenable to implementing the bald eagle habitat prescription from the Forest Plan into their alternative.

Also, in July 2018, we contacted Sierra Access Coalition to discuss that the National Bald Eagle Guidelines and cross-country OSV use were inconsistent with the Forest Plan. The inconsistencies relating to bald eagles are identical to that of the plaintiff's alternative as described in the previous paragraph. The Challenge Experimental Forest was designated in 1942 by the Chief of the Forest Service. A prescription for the experimental forest was incorporated into the Forest Plan. The experimental forest prescription generally allows activities that are compatible with research projects and specifically prohibits off-road vehicle use. Sierra Access Coalition declined any additional changes to alternative 4 and requested that the Plumas National Forest pursue a Forest Plan amendment to adopt the National Bald Eagle Guideline nest buffers and to allow cross-country OSV use or to designate all NFS roads as OSV trails within the Challenge Experimental Forest designated boundary.

The interdisciplinary team relied on public involvement to ensure that a reasonable range of alternatives, representing a broad array of perspectives, would be analyzed in this draft environmental impact statement.

Public Comment Period and Notice of Availability

A letter notifying the public that the DEIS was available for review and comment for 45 days was sent via regular mail (211) or email (531) to interested groups, individuals, tribes, and agencies. The Notice of Availability notifying the public that the DEIS was available for review and comment for 45 days was published in the Federal Register on October 26, 2018 (83 FR 208, page 54105). On October 24, 2018, we also published a notice of the opportunity to comment in the *Feather River Bulletin* (newspaper of record) and sent a press release to local news media outlets.

On Friday, December 7, 2018 we published an amended notice in the Federal Register (83 FR 235, page 63162) extending the comment period from December 10, 2018 to January 24, 2019, to accommodate requests for an extension due to the nearby Camp Fire; which impacted the ability of some potentially interested stakeholders to submit comments by December 10, 2018. On December 3, 2019, we also sent a press release to local news media outlets confirming the comment period extension.

On Friday, February 8, 2019, we published a second amended notice in the Federal Register (84 FR 27, page 2860) extending the comment period from January 24, 2019 to March 1, 2019, as a result of the government shutdown. On February 8 and 11, 2019, we also sent a press release to local news media outlets.

During the DEIS 127-day opportunity to comment period, two public open house meetings were held to discuss the DEIS: February 26, 2019 in Blairsden-Graeagle, CA, at the Graeagle Fire Hall; and February 27, 2019 in Oroville, CA, at the Southside Oroville Community Center. The meetings were attended by 38 individuals.

We received 211 comment letters postmarked or received prior to the end of the 127-day comment period. We considered all comments and responded by modifying alternatives, supplementing, improving, or modifying the analysis, making factual corrections, or explaining why the comments would not warrant further response. These comments and our responses are available in Volume III, appendix I of this FEIS.

Site-specific changes made between the DEIS and FEIS included adding four NFS roads for OSV trail designation and three proposed for grooming; modifications to open areas to reflect site specific information included in comment letters ranging from connectivity to open areas and designated trails; motorized and non-motorized uses; and safety (includes additions, deletions, and modifications of open areas); changes to the areas not designated for OSV use adjacent to the Pacific Crest Trail; removing County roads from NFS OSV designations, but retaining these County roads for grooming, if originally proposed for grooming; and changing the definition of vehicle class from width to pounds per square inch (PSI). A comprehensive list of changes made between the DEIS and FEIS is displayed in volume III, appendix M.

Tribal Consultation

Informal tribal consultations were initiated in November 2014. Scoping letters were sent to all tribal organizations, and in January and February 2015, follow-up telephone calls or face-to-face meetings were held to inform the Tribes of the proposal and respond to questions.

Letters were sent to all tribal organizations providing information about the 45-day comment period, project, and Forest contacts.

Future Administrative Review Opportunities

The Plumas National Forest Over-snow Vehicle Use Designation Project is an activity implementing a land management plan. It is not an activity authorized under the Healthy Forests Restoration Act of 2003 (Pub. L. 108-148). Therefore, this activity is subject to pre-decisional administrative review consistent with the Consolidated Appropriations Act of 2012 (Pub. L. 112-74) as implemented by subparts A and B of 36 CFR part 218.

Issues

Comments that express concerns about cause-effect relationships between the proposed action and its effects are called “issues.” The Forest Service reviewed the purpose and need, proposed action, and scoping comments to identify issues.

Significant issues serve to highlight effects or unintended consequences on a physical, biological, social, or economic resource, not activities, which may result from the proposed action. Significant issues cannot be resolved through routine or standard project design features or management requirements. A significant issue is most often addressed by development and analysis of an alternative to the proposed action. Issues are significant because of the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflicts.

Non-significant issues are: (1) outside the scope of the action; (2) already decided by law, regulation, Forest Plan, or other higher level decision; (3) irrelevant to the decision to be made; (4) conjectural and not supported by scientific or factual evidence; (5) a comment, opinion, or statement of position; or (6) a question for clarification or information. The Council on Environmental Quality NEPA regulations explain this delineation in Section 1501.7, “...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3).”

Significant Issues

Based on public comments, we used content analysis, reading each letter, email, or website submission, and identified approximately 1,322 individual comments and concerns from the 190 commenters. We identified six significant issues to formulate and compare additional action alternatives and environmental effects of each alternative. The six significant issues are

- 1a)** availability of motorized over-snow recreation opportunities;
- 1b)** availability of non-motorized over-snow recreation opportunities;
- 1c)** quality of motorized and non-motorized over-snow recreational experiences;
- 2)** effects to air quality;
- 3a)** effects to terrestrial and aquatic wildlife; and
- 3b)** effects to botanical resources.

Measurement indicators for determining effects to the availability and quality of motorized and non-motorized over-snow recreation opportunities are described in table 1, table 2, and table 3.

Table 1. Cause and effect, measures, and source information for the availability of motorized over-snow recreation opportunities

Issue Topic	Cause and Effect	Measure	Source
1a. Availability of Motorized Over-snow Recreation Opportunities	Designating areas and trails for OSV use has the potential to change recreation settings and opportunities by enhancing opportunities for motorized winter users in some areas and limiting those opportunities in other areas: a) Eliminating popular, highly desirable areas that have been historically available for public, cross-country OSV use; b) Designating an insufficient quantity (miles and acres) of NFS trails and areas for public OSV use; and c) Providing an insufficient quantity (miles) of groomed public OSV opportunities.	Acreage of designated public OSV cross-country use; percent change as compared to current management Length of designated OSV trails (miles), percent change from current management Length of groomed OSV trails (miles), percent change from current management	Travel Management Rule (36 CFR 212), subpart C (applies to three measures)

Table 2. Cause and effect, measures, and source information for the availability of non-motorized winter recreation opportunities

Issue Topic	Cause and Effect	Measure	Source
1b. Availability of Non-motorized Winter Recreation Opportunities	Public OSV use and grooming for public OSV use have the potential to impact the overall quality of the experience of users seeking solitude and a more quiet, non-motorized recreation experience:	Acreage and length of trails (miles) designated for non-motorized recreation enthusiasts within 5 miles of plowed trailheads	Public comments
	<p>a) Reducing the quantity of NFS land available for quiet, non-motorized recreation;</p> <p>b) Allowing OSV use within areas that currently emphasize non-motorized recreation including Semi-Primitive Areas and Proposed or Recommended Wild and Scenic Rivers and Special Interest Areas;</p> <p>c) Increasing the area of overlap between non-motorized (e.g., snowshoeing, cross-country skiing, general snow play) and motorized (i.e., OSV) use; and</p> <p>d) Increasing the distance of travel required in order to access desirable quiet, non-motorized recreation areas (perhaps to distances further than an enthusiast is physically able to travel).</p>	<p>Percent acres available for quiet, non-motorized use that are considered high-quality non-motorized opportunities based on proximity to plowed trailheads (areas within 5 miles of plowed trailheads) and absence of motorized use</p> <p>Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.).</p> <p>Size of areas (acres) affected and duration of impact. Qualitative description for wilderness attributes</p> <p>Size of area (acres) affected and duration of impact. Qualitative description for roadless characteristics</p> <p>Number of crossings; area (acres) where OSV use is allowed within 500 feet of centerline of the PCT</p> <p>Size of areas (acres) affected and duration of impact. Qualitative description for Wild and Scenic attributes</p> <p>Size of areas (acres) affected and duration of impact. Qualitative description for eligible Wild and Scenic attributes</p>	<p>Minimization Criteria: 36 CFR 212.55(b)(3) FSH 1909.12 (72.1)</p> <p>(P.L. 90-543, as amended through P.L. 111-11)</p> <p>Comprehensive Management Plan for the PCT</p> <p>Wild and Scenic Rivers Act</p> <p>The Plumas National Forest LRMP contains direction specific to management of eligible W&S Rivers and streams.</p>

Table 3. Cause and effect, measures, and source information for the quality of winter recreational experiences

Issue Topic	Cause and Effect	Measure	Source
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences	a) Consuming untracked powder desired by non-motorized winter recreationists, particularly backcountry downhill skiers; b) Compacting, tracking, and rutting the snow, making the snow surface difficult and potentially unsafe for non-motorized users to cross-country ski, sled, snowshoe, or walk on;	Percent of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV use assumption categories	OSV-use assumptions for analysis
	c) Creating a real or perceived risk of injury or mortality; d) Creating noise which may affect solitude and quiet recreational opportunities; and e) Impacting the scenery by reducing the amount of unaltered views.	Acreage not designated for public cross-country OSV use; percent change as compared to current management	Minimization Criteria 36 CFR 212.55(b)(3): Consider effects on the following with the objective of minimizing: 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
		Distance of groomed public OSV trails from non-motorized areas Acres and percent of designated acres that are anticipated to have high to moderate OSV-use levels and the associated potential for noise impacts Qualitative/narrative description of potential visual impacts	Wilderness Act of 1964 Wild and Scenic Rivers Act of 1968 National Trails System Act of 1968 Pacific Crest National Scenic Trail Comprehensive Plan Values or features that often characterize Inventoried Roadless Areas (66 FR 3245, January 12, 2001) Minimization Criteria 36 CFR 212.55(b)(5) Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors LRMP Management Area Standards and Guidelines Specific Visual Quality Objectives standards and guidelines pertain to each management area. Visual quality objectives (VQO) include: Preservation (P), Retention (R), Partial Retention (PR), Modification (M), and Maximum Modification (MM)

Table 4. Cause and effect, measures, and source information for the effects to air quality

Issue Topic	Cause and Effect	Measure	Source
2. Effects to Air Quality	Designating areas and trails for public OSV use and grooming trails for public OSV use have the potential to generate exhaust and emit pollutants into the air. This has the potential to degrade the quality of the air. This potential degradation of air quality can impact recreational users, wildlife, and sensitive areas.	Potential contribution of OSV emissions (%)	Federal Clean Air Act Regional Haze Rule (1990 Clean Air Act Amendments, 40 CFR Part 5) LRMP Management Area Standards and Guidelines

Table 5. Cause and effect, measures, and source information for the effects to terrestrial and aquatic wildlife

Issue Topic	Cause and Effect	Measure	Source
3a. Effects to Terrestrial and Aquatic Wildlife	The proposed OSV use designations and trail grooming have the potential to directly, indirectly, and cumulatively impact terrestrial and aquatic wildlife and plant species, including federally listed threatened and endangered species and their habitats by: a) Causing injury or mortality to wildlife and plant species through crushing (or other contact); b) Causing disturbance (e.g., increased noise and human presence resulting in interrupted or lost breeding or feeding opportunities, or movement patterns); c) Causing habitat destruction or modifications through rutting of the underlying road or OHV trail, which could result in sediment delivery during the subsequent runoff season. Spilling or leaking of fuels or oils from OSVs could cause stream contamination at stream crossings;	Terrestrial Wildlife Acres of suitable marten habitat impacted by OSV use	FSM 2670 2004 SNFPA ROD, Standard and Guideline 89, p. 62
		Acres of connectivity habitat with potential to be impacted by OSV use	
		Acres of suitable CSO habitat impacted by OSV use	FSM 2670 Minimization Criteria: 36 CFR 212.55(b)(2)
		Acres of CSO PAC impacted by OSV use Acres of CSO PAC within 100 feet of OSV trail	2004 SNFPA ROD, Standard and Guideline 82, p. 61
		Acres of suitable NOGO habitat impacted by OSV use Acres of NOGO PACs impacted by OSV use Acres of NOGO PAC within 100 feet of OSV trail	FSM 2670 Minimization Criteria: 36 CFR 212.55(b)(2) 2004 SNFPA ROD, Standard and Guideline 82, p. 61

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Issue Topic	Cause and Effect	Measure	Source
3a. Effects to Terrestrial and Aquatic Wildlife (continued)	d) Causing the zone of potential impacts to broaden by designating OSV-use areas rather than restricting OSV use to designated trails; and e) Causing potential increases in OSV use in open areas by designating trails and thereby facilitating access	Acres of bald eagle primary use areas overlapping designated OSV areas	Bald and Golden Eagle Protection Act
		Acres of bald eagle primary use areas within 500 feet of designated OSV trails	Migratory Bird Treaty Act
		Acres of bald eagle nest territories within 660 feet of OSV trails	Minimization Criteria: 36 CFR 212.55(b)(2)
			FSM 2670
			1988 Plumas National Forest LRMP, Bald Eagle Habitat Prescription (Rx-11)
		Acres of mule deer winter range affected by OSV use	Minimization Criteria: 36 CFR 212.55(b)(2)
			CDF&W California Deer Conservation and Management Plan; GOAL 3: Habitat Conservation
		Acres of gray wolf range affected by OSV use	Endangered Species Act
			Conservation Plan for Gray Wolves in CA (2016)
			Minimization Criteria: 36 CFR 212.55(b)(2)
		Acres of willow flycatcher habitat impacted by OSV use	FSM 2670
			2004 SNFPA ROD, Riparian Conservation Objectives 2 and 5

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Issue Topic	Cause and Effect	Measure	Source
3a. Effects to Terrestrial and Aquatic Wildlife (continued)		Qualitative discussion on impact to western bumble bee and bats Aquatic Wildlife Potential Suitable Habitat (PSH) within cross-country OSV-use areas (acres) - amphibians and reptiles PSH within cross-country OSV-use areas (miles) – fish PSH in proximity to designated OSV routes (acres) - amphibians and reptiles PSH in proximity to designated OSV routes (miles) – fish OSV stream crossings within PSH Designated Critical Habitat (DCH) within cross-country OSV-use areas (acres) - California red-legged frog and Sierra Nevada yellow-legged frog DCH in proximity to designated OSV routes (acres) - California red-legged frog and Sierra Nevada yellow-legged frog OSV stream crossings within DCH Critical Aquatic Refuge (CAR) within cross-country OSV-use areas (acres) CAR in proximity to designated OSV routes (acres)	FSM 2670

Table 6. Cause and effect issue statements, measures, and source information for the effects to botanical resources

Issue Topic	Cause and Effect	Measure	Source
3b. Effects to Botanical Resources	<p>The proposed OSV use designations and trail grooming have the potential to directly, indirectly, and cumulatively impact plant species, including federally listed threatened and endangered species and their habitats by:</p> <p>a) Causing injury, loss of vigor or mortality to plant species through compacting snow and crushing of TES plants;</p> <p>b) Compacting snow, crushing of TES plants, possibly causing direct mortality and/or loss of vigor and productivity;</p> <p>c) In designated OSV-use areas, mid-story vegetation is vulnerable to damage caused by OSV use, and mid-story vegetation damage may impact TES plant habitat; and</p> <p>d) Designating areas and trails for public OSV use and grooming trails for public OSV use could also adversely impact botanical resources within research natural areas (RNAs) and special interest areas (SIAs).</p>	Acres of sensitive and watch list plant occurrences within designated OSV-use areas	Endangered Species Act
		Acres of sensitive and watch list plant occurrences within high use areas	FSM 2670
		Special interest plants effects determination	1988 Plumas National Forest LRMP, Forest-wide Standards and Guidelines, p. 4-34
		Acres of TES plant occurrences within designated OSV-use areas	Pacific Southwest Region, Regional Foresters Region 5 Forest Service Sensitive Plant Species list
		Acres of TES plant occurrences within high use areas	Minimization Criteria: 36 CFR 212.55(b)(1)
		TES effects determination category	
		Acres of invasive plant infestation within designated OSV-use areas.	Executive Order 13112 FSM 2900
		Acres of invasive plant infestation within high-use areas	Forest Service National Strategic Framework for Invasive Species Management
		Level of risk (high, moderate, low) for the project introducing or spreading invasive plants	Minimization Criteria: 36 CFR 212.55(b)(1)
		Acres of botanical special interest areas within designated OSV-use areas	Minimization Criteria: 36 CFR 212.55(b)(1)
		Acres of botanical special interest areas within high-use OSV-use areas	1988 Plumas National Forest LRMP, Forest-wide Standards and Guidelines Forest Supervisor letter dated 01/25/1996 re SIA management
		Total acres on Plumas National Forest	Endangered Species Act
		Acres in designated OSV areas	FSM 2670
		Acres in high-use OSV designated areas	1988 Plumas National Forest LRMP

Chapter 2. Alternatives

Introduction

This chapter describes and compares the no-action alternative, proposed action as scoped, modified proposed action, and three additional action alternatives for the Plumas National Forest Over-snow Vehicle Use Designation. It includes a detailed description and map of each alternative plus alternatives considered but eliminated from detailed study, and presents the alternatives in comparative form, sharply defining the differences between alternatives and providing a clear basis for choice among options by the decision maker and the public. Numbers such as acres and miles are approximate due to the use of GIS data and rounding.

Alternative Development

Pursuant to the Multiple-Use Sustainable Yield Act, the National Forest Management Act, and the final Travel Management Rule (36 CFR Part 212, Subparts B and C and Part 261, Subpart A), the Forest Service recognized its responsibility to provide for a system of designated OSV-use areas and trails compatible with the agency's multiple-use mandate for NFS lands. To do so, the Forest Service developed four alternatives to address the significant issues raised during public involvement as described in chapter 1 of the FEIS.

In late August through early October 2016, objections were received for the Lassen National Forest OSV Use Designation Project FEIS, and the Forest was instructed to refine alternatives and release a Revised DEIS. Based on the information learned through that objection resolution process, we modified the Plumas National Forest's proposed action. Specifically, to comply with Travel Management, Subpart C, there was a need to ensure that designated areas occur where there is adequate snow (CFR 212.81), and that specific criteria were addressed with the goal of minimizing effects (CFR 212.55). The development of alternative 2, the modified proposed action, included a focus on these considerations.

Internally, our first efforts focused on identifying areas and trails where existing regulation or policy would restrict OSV use (e.g., wilderness, wild and scenic rivers, Pacific Crest Trail, experimental forests, etc. (approximately 56,828 acres)) and where snowfall would be adequate for OSV use to occur (36 CFR 212.81(a)).

Elevational Range

As a second effort, the interdisciplinary team eliminated all NFS lands below 3,500 feet in elevation. We used the 3,500-foot elevation as a screening tool to narrow our efforts to NFS lands most likely to receive snowfall in adequate amounts to support OSV use. We took into account observed conditions at various elevations across the Forest (frequency of snowfall, longevity, and quality of snow conditions) where snowfall is adequate for OSV use to occur (36 CFR 212.81(a)). Data from the National Weather Service's National Operational Hydrologic Remote Sensing Center (<https://www.nohrsc.noaa.gov/nsa/?region=Sierras>) were also used to evaluate snowpack trends in the Plumas National Forest. The team recognized the variation in snowpack conditions between low and high snowpack years (verified using the California Department of Water Resources Data Exchange Center, <http://cdec.water.ca.gov/snowapp/swcchart.action>). In general, adequate snow occurs in most years above 5,000 feet in elevation, with a deeper snowpack evident above 6,000 feet in elevation. Precipitation falls as either snow or rain, depending on the temperature during the storm event. In the Plumas National Forest, precipitation often falls as rain below 5,000 feet, even during the winter

months. In some years, adequate snow accumulates as low as 3,500 feet. Snow usually does not persist for long at lower elevations because temperatures are too warm, particularly on slopes with a southerly aspect. The existing groomed OSV trail networks in the Bucks Lake, Lakes Basin, and LaPorte areas are located above 4,000 feet in elevation (Bucks Lake: 4,000 to 5,900 feet; Lakes Basin: 5,400 to 7,200 feet; and LaPorte: 4,900 to 6,600 feet). When there is adequate snow, areas above 3,500 feet are used for over-snow recreation. Based on this information, areas above 3,500 feet in elevation were considered for designation for OSV use under alternative 2 - modified.

Alternatives 3 and 5 eliminated all NFS lands below 5,000 feet elevation because this elevation limit was specifically requested in their project specific written comments and alternative submitted during the scoping period. Alternative 4 does not include an elevation limit because specific written comments and alternative submitted during scoping did not include an elevation limit.

The third effort included the interdisciplinary team identifying areas smaller than a ranger district; using the existing groomed trail networks and associated facilities (i.e., staging areas, parking areas, and trailheads) as focal points; and identifying major geographic features such as rivers, ridgelines, major roads, and the Forest's administrative boundary to identify the area boundaries. The Forest was divided into seven areas in which designated OSV-use areas would be considered.

The northern boundary of the Antelope open area is the administrative boundary between the Plumas and Lassen National Forests. The administrative boundary generally follows Keddie Ridge, Moonlight Peak, Cairn Butte, Indicator Peak, Red Rock Lookout, and the Diamond Mountains. The eastern boundary of the Antelope area is shared with the Frenchman open area and follows Plumas County road 172, NFS road 29N43, and Indian Creek. Indian Creek is undesignated and not crossable, except in two locations-Antelope Dam and Babcock Crossing. The southern boundary of the Antelope open area follows private land for the community of Genesee Valley, Plumas County roads 111 and 112, and Indian Creek. Plumas County Roads 111 and 112 are plowed to the Forest boundary where the southern portion of the open area begins. Private lands and Indian Creek are undesignated and not crossable by OSVs. Management objectives for the Genesee Valley (Genesee Valley Special Management Area, Plumas County General Plan) specify that off-road recreational use shall be limited to non-motorized vehicles, and that all trails shall be for non-motorized use only. OSV use in Genesee Valley would not be compatible with the distinct characteristics of the community. The western boundary of the Antelope open area follows private lands for the communities of Indian Valley and Greenville and crisscrosses other private land parcels which are undesignated for OSV use. The open area boundary follows Plumas County road 201 and connects to the administrative boundary between the Plumas and Lassen National Forests.

The northern, eastern, and southern boundary of the Frenchman open area is the administrative boundary of the Plumas National Forest. On the northeastern boundary, at Janesville Grade specifically, there are no topographic features with the exception of Janesville Grade (NFS road 28N01 and Plumas County road 208). The eastern boundary of the Frenchman open area includes the Diamond Mountains and a string of mountains as they rise from the valley to the east. The western boundary of the Frenchman open area is shared with the Davis open area and follows a natural boundary of Red Clover Creek, private land for the community of Clover Valley, Turner Ridge, and Plumas County road 111. The remainder of this boundary follows the Beckwourth-Genesee Plumas County road. There are limited crossings along this boundary as well-Knotson Bridge, Drum Bridge, a bridge at NFS road 25N05, and Plumas County road 177. Plumas County Road 284 is plowed by Caltrans in the south-eastern boundary to the Frenchman Lake dam.

The southeastern boundary of the Davis open area is shared with the Lakes Basin open area and is made up of the administrative boundary for the Plumas National Forest, private lands for communities of Portola, Sierra Valley, Comberg, Sloat, Spring Garden, and Quincy, and follows State Routes 70 and 89. Plumas County Roads 126 and 113 are plowed in the southern boundary of the Davis open area to Lake Davis. Private land and State Routes are not designated for OSV use. The northern portion of the Davis open area follows State Route 89, private land for the community of Indian Valley, Indian Creek, and mountains that rise from Indian Valley.

The southern portion of the Lakes Basin open area is the administrative boundary between the Plumas and Tahoe National Forests. This boundary also follows a ridge system that includes a connection of mountain peaks, Chapman Saddle, Haskell Peak, a ridge south of Gold Lake, and along a ridge with the Pacific Crest Trail. Plumas County Road 519 (Gold Lake Highway) is plowed from near Graeagle-Blairden to the Gold Lake Staging Area. The eastern portion of the Lakes Basin open area is shared with the LaPorte open area and follows McRae Ridge and Eureka Ridge, between the A Tree saddle to the Red Bridge Campground.

The southern portion of the LaPorte open area is the administrative boundary between the Plumas and Tahoe National Forests. This boundary also follows a system of ridges and peaks-Gibraltar, Beartrap Mountain, and Canyon Creek which is a very steep canyon, the creek flows into the North Yuba River, and then into the Oroville Reservoir. Canyon Creek, North Yuba River, and the Oroville Reservoir are not designated for or crossable by OSVs. The southwest boundary overlaps with a significant amount of private lands for the communities of Bullards Bar, LaPorte, Challenge, Woodleaf, Mooretown, Feather Falls, Lumpkin, Fall River, and Walters. Plumas County Road 511 is plowed all the way to the town of La Porte. The entire northern boundary of the LaPorte open area is the Middle Fork of the Feather River, a designated Wild and Scenic River, Inventoried Roadless Area, and Semi-Primitive Area, all of which are not designated for or crossable by OSVs.

The western portion of the Bucks open area is the administrative boundary for the Plumas or between the Plumas and Lassen National Forests with private land to the west. State Route 70 and the Feather River Canyon parallel this boundary, is extremely steep terrain, and not crossable by OSVs. Just north of the Cresta Dam on the Feather River, the northern and eastern boundaries of the Bucks open area is defined by State Routes 70 and 89. Plumas County Road 414 (Bucks Lake Road) runs from the eastern boundary to the center of the open area boundary, and is plowed to Bucks Summit and Big Creek Staging Areas.

The western and northern boundaries of the Canyon open area is the administrative boundary between the Plumas and Lassen National Forests. This boundary also follows Tobin Ridge, Chambers Peak, Ben Lomond Peak, China Ravine and makes up very steep terrain. Private land continues along the western side of the administrative boundary, connects to State Route 89 near Lake Almanor and Butt Valley Reservoir, and continues with private land around Canyon Dam. State Route 89 is plowed, but it lies along the northern and western boundaries of the open area.

The eastern boundary of the Canyon open areas is shared with the Antelope open area and is adjacent to private lands for the communities of Greenville, Indian Valley, Crescent Mills, and Taylorsville. The southern boundary of the Canyon open area follows State Routes 70 and 89, and continues through the Feather River Canyon along State Route 70.

Snow Depth

There is little scientific support for defining a universal, nationwide snow depth for protecting multiple resources. This is due to the variable nature of snowpack, and differences that occur regionally and nationally. For example, Maritime snowpacks, which form in the mountains closest to the ocean such as the Sierra Nevada and Cascades, are deep, warm, and dense with more moisture. Maritime snowpacks, like those found in the Plumas National Forest, exhibit the greatest snow depths, shortest accumulation periods, fastest snowmelt rates, and earliest onset of snowmelt annually (Trujillo and Molotch 2014).

In March 2018, Fassnacht et al. published “Snowmobile impacts on snowpack physical and mechanical properties” in *The Cryosphere*, an interactive open-access journal of the European Geosciences Union. To examine the effects of differing levels of use on snowpack properties, experiments were performed at two different locations in Colorado. Fassnacht et al. found that snow density changes were more pronounced for thinner snow accumulations (the operational standard of 30 centimeters or 11.8 inches) and when snowmobile use started in deeper snowpacks (120 centimeters or 47 inches) there was less difference in density, hardness, and ram resistance compared to no snowmobile use. These results suggest that from a management standpoint, it may be desirable to limit snowmobile use in shallower snow conditions to avoid increases in density, hardness, and ram resistance that could possibly impact land resources below the snowpack.

The interdisciplinary team agrees that designating a minimum snow depth requirement when considering areas to designate for OSV use was mutually beneficial and provided a means to minimize resource damage. Designating a minimum snow depth requirement provides a quantifiable and tangible mechanism for managing when OSV use occurs during times of the year when snow depths are most variable. Minimum snow depth provides a way to ensure adequate snow is present before OSV use occurs. The minimum snow depth is included in each alternative to minimize potential effects to resources.

It is also worth noting that recent consultations with the State Historic Preservation Officer (SHPO) by the Stanislaus National Forest resulted in a recommendation that a 12-inch minimum snow depth be used to fully meet On-Site Historic Property Projection Measure (SPM) 2.1(b) of appendix E of the Region 5 Programmatic Agreement with SHPO (2018) for protecting historic properties and to be in compliance with Section 106 of the National Historic Preservation Act. SPM 2.1(b) states:

2.1 The following historic property protection measures may be approved for undertakings under the conditions detailed below:

(b) Accumulation of sufficient snow as determined by the [Heritage Program Manager/District Heritage Program Specialist] HPM/DHPS over archaeological deposits or historic features to prevent surface and subsurface impacts. Undertaking activities may be implemented over snow cover on historic properties under the following conditions:

(1) The cover must have at least 12 inches depth of snow or ice throughout the duration of undertaking activities on sites.

If the Plumas National Forest includes a 12-inch or greater minimum snow depth requirement for each OSV-use area and trail designation proposed across the alternatives, no historic properties would be affected under these conditions as per the provisions of the Programmatic Agreement. This “no effect” determination eliminates the need to survey all unsurveyed terrain in this project area and the need for additional formal consultation with the SHPO under Section 106.

The surest way to avoid causing damage to an OSV and resource damage, is to operate an OSV when the snowpack is greatest. For this reason, a minimum snow depth requirement would alter an OSV recreationist's season of use very little.

The Forest Service recognizes the concerns of OSV recreationists, groups, alliances, and networks. It is the responsibility of the responsible official to designate a system of OSV trails and areas with the objective of minimizing damage to soils, water, vegetation, and cultural resources; harassment of wildlife; and significant disruption of wildlife habitat. We believe that inclusion of a minimum snow depth requirement contributes to ensuring the minimization criteria are met.

Alternative 3 includes a cross country snow depth of 18 inches because this snow depth was specifically requested in project specific written comments submitted during scoping.

Alternative 4 includes a cross-country snow depth of 12 inches and no snow depth minimum for designated trails, groomed or ungroomed. These snow depths applied to alternative 4 because these snow depths were specifically requested in project specific written comments submitted during scoping.

Alternative 5 includes a cross country snow depth of 24 inches because the project specific written comments submitted during scoping preferred a snow depth that was deep enough to protect resources higher than 12 inches.

When developing alternatives, zero, six, twelve, and eighteen inches were already incorporated into an action alternative. The frequency of snow depths was every six inches, therefore alternative 5 was assigned 24 inches, 6 inches greater than 18 inches.

Applying the Minimization Criteria and Other Specific Designation Criteria

As an integral component in developing alternatives, the Forest Service considered, pursuant to the Travel Management Final Rule (36 CFR 212), the potential effects of designating NFS trails and areas on NFS lands for OSV use with the objective of minimizing:

- Damage to soil, watershed, vegetation, and other forest resources;
- Harassment of wildlife and significant disruption of wildlife habitats;
- Conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands; and
- Conflicts among different classes of motor vehicle uses of National Forest System lands or neighboring Federal lands.

In addition to these minimization criteria, the Forest Service also considered other specific designation criteria pertaining to:

- Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.
- Valid existing rights; and
- The rights of use of national forest trails of access in designating trails and areas for OSV use.

Step 1: Development of Screening Questions

The interdisciplinary team developed resource-specific minimization criteria screening questions that resulted in specific information regarding the potential impacts of OSV use within areas and along trails potentially designated for OSV use. Specific questions were developed for resource areas related to Minimization Criteria (36 CFR 212.55(b)(1-4)) and Specific Designation Criteria (36 CFR 212.55(b)(5))(appendices D and E).

Step 2: Area and Trail Screening Exercise

Existing data and personal knowledge of Forest Service personnel and the public were used to screen each area and trail potentially designated for OSV use. The primary data sources used for this screening exercise was geographic information system (GIS) of historical and current survey data and corporate datasets. The resource-specific screening questions developed in step 1 provided the mechanism for the interdisciplinary team to systematically consider each area and trail and document the results.

Damage is defined as “injure, mutilate, deface, destroy, cut, chop, girdle, dig, excavate, kill or in any way harm or disturb” (36 CFR 261.2) resulting in physical harm that impairs value, usefulness, or normal function. Harassment of wildlife (as defined by the Endangered Species Act) is an “intentional or negligent act which creates the likelihood of injury to a species by annoying the species to such an extent as to significantly disrupt its normal behavioral patterns.”

The screening questions were established to identify where OSV use within areas and along trails would cause an effect to soil, water, vegetation, cultural resource, wildlife or their habitats, and recreation opportunities and experiences. Because OSV use could have an effect without impairing value, usefulness, or normal function or without significantly disrupting a species; normal behavior or habitat, the screening questions used for each area and trail used a more sensitive threshold that is required by Subpart B, 36 CFR 212.55(b); (d); and (e) of the Travel Management Rule.

Step 3: Measures to Minimize Impacts

After potential impacts of conflicts were identified in Step 2, the interdisciplinary team considered whether a measure could be applied or if necessary to reduce the impact. If a measure was necessary, the measure was developed and specifically tied to a potential or occurring impact. In some instances, the measure became a component of one or more alternatives (e.g., minimum snow depth). In other instances, the measure identified was to not designate a trail or a portion of an OSV-use area and those trails or areas were eliminated from one or more alternatives. In addition, when measures were proposed, the interdisciplinary team provided citations to law, regulation, policy, direction, etc. (Appendices D and E).

Step 4: Designation Recommendation

The final step in the screening exercise was to make a designation recommendation. The designation recommendations are documented in the same worksheet with the measures identified in step 3 (Appendices D and E).

Refinement of the Action Alternatives

Minimization criteria were developed for the modified proposed action and then applied to alternatives 3 and 5. Additional prohibitions, restrictions, and proposed designations were applied to alternatives 3 and 5 to fully consider internal and external comments, concerns, and impacts, and to

develop a range of alternatives and effects for the responsible official's consideration when making a decision.

The proposed action (alternative 6), as originally scoped in the September 29, 2015 Notice of Intent, was developed to balance motorized and non-motorized opportunities. After reviewing scoping comments, evaluating minimization criteria, evaluating lessons learned from OSV projects on other forests in Region 5, finding inconsistencies with the 1988 Forest Plan and the Travel Management Rule, and discovering minor errors in proposed OSV trail and area data, the proposed action was modified. The original proposed action (alternative 6) has been retained in this chapter and in tables throughout the FEIS for comparison purposes only. It was not carried forward for detailed analysis.

The modified proposed action (alternative 2 – modified) strives to balance the availability of motorized and non-motorized winter recreation opportunities and minimization of impacts to natural and cultural resources. Modifications to alternative 2 - modified include: identifying areas smaller than a ranger district; minor changes to proposed OSV-use areas and trails based on scoping comments; application of 3,500-foot elevation to consider adequate snowfall; application of minimization criteria and resulting measures; application of the required minimum snow depth; appropriate changes for consistency with the Forest Plan; along with minor changes to data. Further site-specific modifications were also made as a result of comments received through the public comment period. A comprehensive list of these site-specific modifications is contained in the project record.

Minimization criteria were used to shape the designation of areas and trails for OSV use. Alternative 2 – modified specifically minimized effects for OSV use and are briefly presented below. More information and details are provided in appendices D and E.

Open, flowing and frozen water were not designated for OSV use. Water Quality National Core Best Management Practices include two practices that apply to over-snow vehicle use (appendix C). For safety and to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources from OSV use, open, flowing and frozen water were not designated for OSV use. Further, the purpose of this project is to designate NFS lands for OSV use, not open flowing or frozen water bodies.

Snow depth, specifically 12 inches, was considered during minimization criteria evaluation. A minimum snow depth of 12 inches minimizes effects to meadows, wetlands, and riparian areas; vegetative cover and soil or trail surfaces; road surfaces; threatened, endangered, and Region 5 Forest Service Sensitive plant species; Sierra Nevada Yellow-legged frogs and their habitat; and historic properties (Stipulation 2.1(b), appendix E of the R5 Heritage Resource Programmatic Agreement (2018).

Key deer winter range, occupied critical habitat for Sierra Nevada Yellow-legged frogs, and bald eagle nesting territories and winter roost areas were not designated for OSV use. By not designating these areas harassment significant disruptions to wildlife were minimized. However, pass-through only travel on designated OSV trails would be allowed in areas with occupied critical habitat or bald eagle nesting territories. Limiting OSV travel to the trail only within (and adjacent to) would minimize potential adverse effects.

Areas adjacent to Bucks Lake Wilderness and Plumas-Euerka State Park would not be designated for OSV use. To accommodate current use patterns and reduce potential conflicts between motorized and non-motorized uses, the high value non-motorized recreation areas within the Black Gulch area between the eastern boundary of Bucks Lake Wilderness and Silver Lake Road, south of Silver Lake

and north of Bucks Lake Road would not be designated for OSV use. To facilitate enforcement and prevent motorized entry into the wilderness, the area north of Bucks Lake Road between the staging area and the east arm of Bucks Lake would not be designated for OSV use. To accommodate current use patterns and reduce potential conflicts between motorized and non-motorized uses, the high value non-motorized recreation areas adjacent to Plumas-Eureka State park would not be designated for OSV use. This includes areas west, south, and east of Plumas-Eureka State Park. This is consistent with Plumas LRMP direction for the Lakes Basin Semi-primitive Area (Rx8) and Management Area 35, Lakes Basin: “Allow motorized over-the-snow travel, but consider restricting to designated areas if conflicts develop with other uses or resources” (page 4-324). The Smith Lake Area receives high non-motorized use and low OSV use and would not be designated for OSV use. The cross-country ski trail along Graeagle Creek in Lakes Basin Recreation Area would remain non-motorized and not designated OSV use.

Minimizing conflicts between motorized vehicles class was considered during minimization criteria evaluation. Because Class 1 and 2 OSVs are used throughout the Forest, to reduce conflicts among vehicle classes and minimize effects to natural and cultural resources Class 2 OSVs would be restricted to designated, groomed trails and prohibited from operating in designated open areas or on ungroomed OSV trails. The Forest would coordinate with Plumas and Sierra Counties to temporarily close designated, groomed trails to wheeled vehicles.

Some semi-primitive areas (Bald Rock, Dixon Creek, Grizzly Peak, Middle Fork, and Thompson Peak; portions of Beartrap, Chips Creek, Keddie Ridge, and Lake Basin) were not designated for OSV use. Changes between the DEIS and FEIS included removing open areas in the Chips Creek area. Most semi-primitive areas overlap with RARE II areas, but do not share identical designated boundaries. Semi-Primitive Area Prescription (Rx-8) of the 1988 Plumas National Forest Land and Resource Management Plan (LRMP) was not recommended for designation in open areas to minimize effects to the semi-primitive nature of Rx-8. The Semi-Primitive Prescription description in the LRMP emphasizes non-motorized recreation and states “this prescription applies to essentially undisturbed areas to maintain a remote forest setting and allow non-motorized, dispersed recreation. Activities are permitted only if they are unobtrusive and maintain the character of the area” and applies to a total of 79,500 acres of NFS land (p. 4-88). Semi-primitive areas are high value areas for non-motorized users and were not designated for OSV use to minimize conflicts between motor vehicle use and existing and proposed recreational uses of NFS lands. Areas that are included for designation provide connectivity to adjacent Forests and provide access to peaks. In general, semi-primitive areas were not designated for OSV use.

Some inventoried roadless areas (Adams Peak, Keddie Ridge, Bald Rock, and Lakes Basin; portions of Chips Creek, Grizzly Peak, Middle Fork, West Yuba, and Bucks Lake) were not designated for OSV use. In cases where semi-primitive areas overlap with RARE II or 2001 Inventoried Roadless Areas, the semi-primitive area was not designated for OSV use to minimize effects to the semi-primitive nature of Rx-8. Inventoried Roadless Areas can often take pressure off heavily used wilderness areas by providing solitude and quiet, dispersed recreation opportunities (Special Areas; Roadless Area Conservation, Federal Register, Vol. 66, No. 9, p. 3245). In general, IRAs were not designated for OSV use.

Some Special Interest Areas (Feather Falls Scenic Area, Valley Creek Botanical Area, Butterfly Valley Botanical Area, Big Bald Rock Scenic Area, and Soda Rock Travertine Geologic Area) were not designated for OSV use. Forest Goals and Policies for special areas in the 1988 LRMP direct the Plumas National Forest to “protect other areas of unique geological, scenic, or ecologic value” (p. 4-

11). Special Interest Areas were not designated for OSV use to protect their unique values for which they were formally established and designated.

Proposed botanical Special Interest Areas resulting from an administrative appeal to the 1988 LRMP were also not designated for OSV use. Proposed Special Interest Areas include: Brady's Camp, Dixie Mountain, Eastern Escarpment, Fales Basin, Fowler Lake, McRae Meadows/Nelson Creek, McNab Cypress, Mountain House Creek, Mount Fillmore, and Red Hill. Proposed Special Interest Areas were not designated for OSV use to protect their unique values and not preclude the area for future formal establishment and designation.

Two Research Natural Areas, Mud Lake/Wheeler Peak and Mt. Pleasant, were not designated for OSV use. Forest Goals and Policies in the 1988 LRMP state "protect unique botanical values for research purposes" (p. 4-11). The Research Natural Area Prescription (Rx-17) of the 1988 LRMP prohibits recreational uses that would contribute to the modification of the area and directs the Forest to manage recreational uses according to the Recreation Opportunity Spectrum (ROS) class of Semi-Primitive Non-Motorized (SPNM) (p. 4-111).

The wild zones of designated and eligible Wild and Scenic Rivers were not designated for OSV use. The 1988 LRMP directs the Forest to "provide for recreation in a primitive setting" and "permit no additional motorized access route to the river and no motorized transportation along the river" (p. 4-69). Eligible segments of streams and rivers resulted from an administrative appeal to the 1988 LRMP and interim guidelines requiring that activities within 0.25 mile of each bank of an eligible river or stream segment would be managed consistent with direction for Wild and Scenic Rivers until eligibility and classification is determined.

Alternative 2 – modified includes the designation of seven cross-country OSV-use areas (858,436 acres) and 226 miles of trails for OSV use where 143 miles would be groomed and 83 miles would be ungroomed. There are 2,753 miles of undesignated, unmarked, ungroomed trails underlying the designated OSV use areas. A minimum snow depth requirement of 12 inches within the designated cross-country OSV-use areas; 6 inches along designated OSV trails; and 12 to 18 inches along designated groomed trails (consistent with California Snowmobile Grooming Standards). Specific to the Pacific Crest Trail (PCT), alternative 2 - modified would designate 12 OSV trails where motorized routes on the Plumas Motorized Vehicle Use Map (MVUM) cross the PCT and 4 OSV trails along the shared Plumas and Tahoe National Forests' administrative boundary that are not existing motorized routes and their width would range up to 0.25 mile.

Alternative 2 was modified after reviewing comments submitted during the 127-day comment period. Changes included adding four NFS roads for OSV trail designation and three proposed for grooming; modifications to open areas to reflect site specific information included in comment letters ranging from connectivity to open areas and designated trails; motorized and non-motorized uses; and safety (includes additions, deletions, and modifications of open areas); changes to the areas not designated for OSV use adjacent to the Pacific Crest Trail; removing County roads from NFS OSV designations, but retaining these County roads for grooming, if originally proposed for grooming; modifying OSV trail designations if grooming was not proposed and maintaining OSV trail designations if the OSV trail had restrictions or crossed an undesignated area; and changing the definition of vehicle class from width to pounds per square inch (PSI).

Updated information was added between the draft and final EIS for some, but not all, resource areas. For wildlife, GIS layers for all the species were reassessed to comply with the modified alternative 2 changes. Species models were rerun accordingly and the wildlife section updated with the new

acreages. Air added a statement relative to the air quality standards and minimization criteria, addressing why air impacts are similar across alternatives. Fisheries confirmed that the GIS and associated tabular data were correctly used. Transportation added verbiage to clarify why transportation effects were generally similar across alternatives. Botany made clarifications as to plant species' occurrence in the Forest.

Socioeconomics made the following changes: (1) added the discussion of social bonding to the values, beliefs, and attitudes section; (2) added discussion of cumulative effects related to economic activity common to all alternatives; (3) developed the economic effects analysis by forest area; and (4) updated data or changes in the alternatives by updating the effects analysis and figures based on the modifications to the alternatives and updated OHV state registration data and the related discussion of trends in the affected environment section.

Recreation made the following changes: (1) added clarification between ROS class and Forest Plan prescription; (2) corrected the description of PCT non-motorized zone; (3) for the affected environment, updated all area descriptions to describe the semi-primitive areas that were considered under RARE11 in the Forest Plan; (4) added information into the text of the analysis that is included in the minimization criteria worksheets (such as request for context of conflicts that are described in the worksheets); (5) removed duplicate items under each area for minimization criteria to a section "common to all"; (6) conducted additional GIS analysis and narrative description of the proximity of areas designated for OSV use within 500 feet of the PCT to areas that are likely to receive winter non-motorized use (within 5 miles of plowed trailheads); and (7) conducted additional GIS analysis and prepared maps to include miles of PCT where OSV use is designated within 500 feet of the trail.

Alternative 3 is a detailed alternative submitted by Snowlands Network and Winter Wildlands Alliance during the public scoping period. Components of this alternative would address significant issues and concerns relating to the 1b) availability of non-motorized over-snow recreation opportunities; 1c) quality of motorized and non-motorized over-snow recreation experiences; and 2) effects to air quality. In response to this issue, this alternative proposes to preserve the non-motorized, semi-primitive setting of inventoried roadless areas, NFS land adjacent to the Bucks Lake Wilderness, Wild Zone of the Middle Fork Feather River Wild and Scenic River, semi-primitive areas, special interest areas, and research natural areas by not designating OSV-use areas or trails within these NFS lands. Changes were made to alternative 3 after scoping, based on correspondence and meetings regarding points of clarification and components considered outside the scope of the action.

Minimization criteria were used to shape the designation of areas and trails for OSV use. Alternative 3 minimized effects for OSV use and are briefly presented below. More information and details are provided in appendices D and E.

In general, all minimization criteria provided for alternative 2 – modified were applied to alternative 3. Additional minimization criteria was applied to alternative 3 because they were specifically requested in project specific written comments submitted during scoping or to provide a better range of alternatives and effects.

Two additional Special Interest Areas (Little Volcano Geological Area and Little Last Chance Canyon Scenic Area) were included in alternative 3 in areas not designated for OSV use. These Special Interest Areas were considered in minimization criteria evaluation and concluded that OSV use would not likely cause adverse effects to the geological or scenic values because there would be 12 inches of snow or ice on the landscape.

Table 7. Specific (and minimization) criteria (areas and trails proposed for designation for OSV use)

1 Minimize Damage to Soil, Watershed, Vegetation and Other Forest Resources	2 Minimize Harassment of Wildlife and Significant Disruption of Wildlife Habitats	3 Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands or neighboring Federal lands	4 Minimize conflicts among different classes of motor vehicle uses on NFS lands or neighboring Federal lands	5 Consider compatibility of motor vehicle use with existing conditions in populated areas*
<ul style="list-style-type: none"> •Would the area (or trail) be located within defined Riparian Conservation Areas for surface waters, including streams, lakes, and reservoirs? •Would the area (or trail) contain sensitive riparian areas, for example wet meadows, bogs, fens, etc.? •Would the area (or trail) drain into a 303(d)-listed waterbody? •Would the area (or trail) contain cultural, tribal, or historic sites? 	<ul style="list-style-type: none"> •Would the area encompass California spotted owl and/or goshawk nest sites or PACs? •Would the area encompass known bald eagle nest or winter roost sites? •Would the area contain key deer winter range? •Would the area contain TES habitat and/or designated critical habitat? 	<ul style="list-style-type: none"> •Would OSV use in this area (or trail) cause conflicts with non-motorized visitors' desire for solitude and quiet recreation (for example near popular quiet areas of high value areas for backcountry skiing?) •Would the area (or trail) be within or adjacent to a location valued for non-motorized use, including: PCT, Wilderness, Wild & Scenic rivers, ski areas (cross-country, downhill), Semi-primitive Areas, and/or Inventoried Roadless Areas? •Would the area (or trail) abut a wilderness area or national park managed by other agencies? •Would the area (or trail) abut a developed recreation site? 	<ul style="list-style-type: none"> •Would this area (or trail) allow wheeled motor vehicle use over snow? If so, would this affect safety and winter management of this area? •Would this area (or trail) conflict with plowed roads allowing vehicle use? Are road crossings allowed by OSVs? • Does this area (or trail) receive use by both tracked over-snow vehicles that exert a ground pressure of less than 1.5 pounds per square inch and over-snow vehicles that exert a ground pressure of greater than 1.5 pounds per square inch? Would this potentially create conflicts? 	<ul style="list-style-type: none"> •Is the area (or trail) adjacent to neighborhoods and communities? If so, would OSV use in this area (or trail) be compatible with distinct characteristics of the communities? •Would the sounds and emissions from OSV use of this area (or trail) be compatible with nearby populated areas? •Would the area (or trail) be located adjacent to Federal or State lands designated for OSV use?

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<p style="text-align: center;">1</p> <p style="text-align: center;">Minimize Damage to Soil, Watershed, Vegetation and Other Forest Resources</p>	<p style="text-align: center;">2</p> <p style="text-align: center;">Minimize Harassment of Wildlife and Significant Disruption of Wildlife Habitats</p>	<p style="text-align: center;">3</p> <p style="text-align: center;">Minimize conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands or neighboring Federal lands</p>	<p style="text-align: center;">4</p> <p style="text-align: center;">Minimize conflicts among different classes of motor vehicle uses on NFS lands or neighboring Federal lands</p>	<p style="text-align: center;">5</p> <p style="text-align: center;">Consider compatibility of motor vehicle use with existing conditions in populated areas*</p>
<ul style="list-style-type: none"> •Are TES plants known to occur in or around the area (or trail) under consideration, particularly those that are near, at, or above the surface of the snow? •Would the area (or trail) include designated botanical areas (SIA, RNA)? 	<ul style="list-style-type: none"> •Would the area contain habitat for marten, wolverine, or other sensitive forest carnivores? 			

*Note: Column 5 is not a minimization criterion, but is required to be specifically considered by the Travel Management Regulations

Areas adjacent to Bucks Lakes Wilderness, Plumas-Eureka State Park, and Lake Davis were not designated for OSV use to minimize conflicts between users. These areas include those listed in alternative 2 and include more acres NFS lands around these specific areas.

Alternative 3 proposes to designate approximately 257,804 fewer acres than alternative 2 - modified, less than any action alternative, to maintain or preserve areas historically used by non-motorized winter users and wildlife habitat. Alternative 3 proposes to designate approximately 600,542 acres of designated OSV-use areas and 220 miles of groomed trails for OSV use. There are 1,499 miles of undesignated, unmarked, ungroomed trails underlying the designated OSV-use areas. Alternative 3 increases the minimum snow depth for cross-country OSV use to 18 inches and 12 inches for groomed OSV trails. Specific to the PCT, alternative 3 would designate nine OSV trails where motorized routes on the Plumas MVUM cross the PCT and where trail 12E39 joins the PCT (west of Gold Lake).

Alternative 4 is a detailed alternative submitted by Blue Ribbon Coalition and Sierra Access Coalition in accordance with the settlement agreement in the case of *Snowlands Network et al. v. U.S. Forest Service* during the public scoping period. Components of this alternative would address one significant issue and concerns relating to the availability of motorized over-snow recreation opportunities. In response to this issue, this alternative proposes to designate approximately 350 additional miles of designated and groomed OSV trails than alternative 2 and approximately 302,449 more acres of designated cross-country OSV areas, more than any action alternative, to maintain areas historically used by motorized winter users and provide a quality OSV trail network. Changes were made to alternative 4 after scoping, based on correspondence and meetings regarding points of clarification and components considered outside the scope of the action.

Alternative 4 proposes to designate approximately 1,160,795 acres of OSV-use areas and 577 miles of groomed trails for OSV use. There are 2,610 miles of undesignated, unmarked, ungroomed trails underlying the designated OSV-use areas. A minimum snow depth requirement of 12 inches in designated cross-country OSV areas and no minimum applied to designated OSV trails with or without grooming. Specific to the PCT, alternative 4 would designate 31 OSV trails where motorized routes on the Plumas MVUM cross the PCT and 6 OSV trails along the shared Plumas and Tahoe National Forests' administrative boundary that are not existing motorized routes and their width would range up to 0.25 mile. This alternative includes designation of cross-country OSV use adjacent to the PCT.

Minimization criteria, with the exception of a 12 inch snow depth for cross-country OSV open areas, was not applied to alternative 4. This is because project specific written comments and alternative specific information were considered as submitted during scoping.

Alternative 4, as submitted by intervenors, included designation of NFS lands for cross-country OSV use within the Challenge Experimental Forest and suggested application of a 330-foot buffer around bald eagle nest areas, both activities which are currently inconsistent with the 1988 Plumas National Forest Land and Resource Management Plan ("Forest Plan"). Per the settlement agreement, "nothing in [the Agreement] is intended to or shall be construed to amend or require amendment of any Forest Plan" (*Snowlands et al. v U.S. Forest Service Settlement Agreement*, August 26, 2013, pp. 5-6). Additionally, Forest Service planning regulations clarify that the responsible official, in this case the Forest Supervisor, has the discretion to determine whether and how to amend the plan (36 CFR 219.13(a)). Alternative 4 will be analyzed in detail except for the following proposed activities that are inconsistent with the 1988 Plumas Forest Plan.

The Challenge Experimental Forest is a designated area established for research purposes. The 1988 Plumas Forest Plan developed a prescription specific to the Challenge Experimental Forest, including general direction and standards and guidelines (USDA Forest Service 1988, pp.4-78 – 4-79). Cross-country OSV use is prohibited within the designated boundary area of the Challenge Experimental Forest, as general direction encourages only recreation that is compatible with Pacific Southwest Research Station (PSW) projects within the experimental forest. The prohibition of motorized vehicles in the Challenge Experimental Forest is to provide controlled conditions for experimental work. Given that the experimental forest is on the western boundary of the Plumas National Forest representing the lowest elevation closest to the foothills that doesn't align with high-quality OSV areas with adequate snowfall, surrounded by private land to the west and south, and represents only 0.03 percent of NFS lands within the Plumas Forest that could be made available for cross-country OSV use, the Forest Supervisor did not believe it would be feasible to designate this area, hence will not pursue a plan amendment to allow cross-country OSV use within the Challenge Experimental Forest. Thus this proposed activity will not be analyzed in detail as part of alternative 4.

The 1988 Plumas Forest Plan developed plan components specific to the Bald Eagle Habitat Prescription, including general direction and standards and guidelines (USDA Forest Service 1988, pp.4-96 – 4-98). This prescription applies to occupied and potential bald eagle habitat, directing all permissible uses of NFS lands to be limited to those that encourage species recovery, minimize disturbance, improve habitat, and maintain habitat. With regard to recreation, the general direction for bald eagle habitat limits recreation use in bald eagle habitat, and identifies standards and guidelines that close the areas to ORV use and preclude development of recreation facilities within nesting territories (Ibid, p. 4-96). "ORV" is defined as "Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice, marsh, swampland, or other natural terrain." (Plumas National Forest EIS for LRMP, Glossary, Definitions, p. 29). Early during the planning process the Acting Forest Supervisor directed the Interdisciplinary team to follow the National Bald Eagle Management Guidelines (USFWS 2007) stating these national guidelines superseded Forest Plan direction for eagle management. This direction was included in the Notice of Intent published in the Federal Register initiating the scoping period. However, subsequent to the Acting Supervisor's direction to follow National Bald Eagle Management Guidelines (USFWS 2007), there was a bald eagle take incident at Lake Davis on June 4, 2016. In response, USFWS provided the forest with mitigation measures to prevent future take of eagles during the specific event where an eaglet died, and provided recommended buffer distances for mitigating impacts to eagles for other activities across the forest, taken from Guidelines for Raptor Conservation in the Western United States (USFWS-Region 8 Migratory Birds 2008). These national guidelines make specific note that in open areas where there are little or no forest or topographic buffers, such as in many western states, the distance alone must serve as the buffer, and that buffer distances may need to be larger than those in the national guidelines (i.e., greater than 660 feet). In response, USFWS Region 8 provided the forest with activity specific recommended buffer zones for eagle management in the forest. USFWS recommendations are more protective of nesting eagles compared to the Plumas Forest Plan. Alternative 4, as submitted, is inconsistent with the Plumas Forest Plan, because this alternative proposes lesser restrictions (330-foot buffer around nest locations) to protect bald eagles than the Forest Plan (protects a variety of habitat components, more than nest locations), which are necessary to mitigate against future take. After considering the USFWS recommendation for a 1-mile buffer as well as the Bald Eagle Habitat Prescription protections in the Forest Plan, the responsible official chose not to amend the plan, and the proposed smaller buffers of 330 feet will not be analyzed in detail as part of alternative 4.

Alternative 5 is a detailed alternative submitted by Friends of Plumas Wilderness during public comments and further modified by the interdisciplinary team. This alternative addresses significant issues and concerns of 1b) availability of non-motorized over-snow recreation; 1c) quality of motorized and non-motorized over-snow recreation experiences; 2) effects to air quality; and 3a and 3b) effects to terrestrial and aquatic wildlife and botanical resources. In response to these issues, this alternative proposes to designate approximately 206,470 fewer acres of cross-country OSV areas and 16 fewer miles of designated and groomed OSV trails than alternative 2 - modified, to preserve NFS lands in alternative 3 and maintain areas historically used by motorized and non-motorized winter users. Alternative 5 also includes enhanced restrictions to designated OSV trails and cross-country areas to protect bald eagle primary use areas and northern goshawk protected activity centers (PAC). Changes were made to alternative 5 after scoping, based on correspondence and meetings regarding points of clarification and components considered outside the scope of the action.

Minimization criteria were used to shape the designation of areas and trails for OSV use. Alternative 5 minimized effects for OSV use and are briefly presented below. More information and details are provided in appendices D and E.

In general, all minimization criteria provided for alternatives 2 – modified and 3 were applied to alternative 5. Additional minimization criteria was applied to alternative 5 because they were specifically requested in project specific written comments submitted during scoping or to provide a better range of alternatives and effects.

The majority of Semi-Primitive Areas were not designated for OSV use, with a few exceptions to allow for cross-country travel in areas historically used by OSVs. All Inventoried Roadless Areas were not designated for OSV use. Areas considered for wilderness, semi-primitive, roadless, etc. characteristics during the development of the 1988 LRMP were submitted in the ‘conservationist alternative’ during the 1988 land management planning process. These areas were included in the alternative specific information submitted during this project’s scoping period and were not designated for OSV use.

On designated trails available for grooming within and adjacent to Northern goshawk breeding areas, the designated snow trails would allow pass-through travel on the trail; cross-county OSV travel would not be designated adjacent to the trail.

Alternative 5 proposes to designate approximately 651,876 acres of OSV-use areas and 210 miles of groomed trails for OSV use. There are 1,660 miles of undesignated, unmarked, ungroomed trails underlying the designated OSV-use areas. This alternative proposes a minimum snow depth requirement of 24 inches within the designated cross-country OSV-use areas; 12 inches along designated OSV trails; and 12 to 18 inches along designated groomed trails. Specific to the PCT, alternative 5 would designate 24 OSV trails where motorized routes on the Plumas MVUM cross the PCT and have a width of 14 feet.

Alternatives Considered in Detail

The action alternatives (alternatives 2 - modified through 5) and the no-action alternative (alternative 1) are considered in detail. The no-action alternative, as required by the implementing regulations of NEPA, serves as a baseline for comparison among alternatives (73 Federal Register 142, July 24, 2008; p. 43084-43099). The following sections describe each of the alternatives considered in detail. There is a map associated with each alternative.

Alternative 1: No Action (Continued Current Management)

The no-action alternative is required under the NEPA regulations [40 CFR § 1502.14(d)]. This alternative reflects the current management activities related to snowmobile use in the Plumas National Forest, and represents the existing baseline condition or trends by which the action alternatives are compared. Several components of this alternative are not consistent with the Travel Management Regulation – Subpart C. Therefore, this alternative will serve as a baseline for comparison of the other proposed alternatives.

Under alternative 1, no areas would be designated for OSV use; however, public OSV use would continue to be allowed in all areas of the Plumas National Forest (1,147,825 acres) except for areas with existing prohibitions (Bucks Lake Wilderness (21,000 acres), Challenge Experimental Forest (3,400 acres), the Pacific Crest Trail (79 miles), (approximately 170 acres), within Rx-11 Bald Eagle Habitat Prescription (Plumas LRMP EIS, USDA Forest Service, 1988, p. 3-24) (Plumas LRMP EIS, USDA Forest Service, 1988, p. 4-96). The wild zone of Wild and Scenic Rivers. Permit no additional motorized access routes along the Middle Fork of the North Fork Feather River (Plumas Forest Plan, USDA Forest Service, 1988, pp. 4-69 and 4-70) (appendix B). The total acres presented as “available” for OSV use in alternative 1 is an over-representation of where OSV use may actually occur. Some of these acres are under 3,500 feet elevation, and therefore, are unlikely to receive snow in quantities adequate enough to support OSV use, if at all.

The Plumas National Forest has a total of approximately 227 miles of OSV trails available for use. Approximately 203 miles of designated OSV trails are available for grooming and 24 miles are marked for OSV use, but are not groomed. There are 2,879 miles of unmarked, undesignated trails available for use in alternative 1 (appendix A, tables 1 and 2, and figure 1).

Although public cross-country OSV travel would be available, alternative 1 does not (1) designate a system of OSV trails or areas as directed by Subpart C of the Final travel Management Rule (36 CFR 212), and (2) identify the location of, or analyze the effects of, groomed trails. The Forest Plan does not establish a minimum snow depth for trail or cross-country public OSV use.

The Forest Plan does not provide specific management direction for OSV trail grooming activities; however, the Forest follows the California State Parks’ Off-Highway Motor Vehicle Recreation Division snow depth standard for grooming, which is currently 12 to 18 inches of snow.

Approximately 79 miles of the PCT traverse the Plumas National Forest. Of that, 76 miles of the PCT is on National Forest System lands. OSV use on the PCT is prohibited by the National Scenic Trails Act, P.L. 90-543, Section 7(c). There are no designated OSV crossings of the PCT.

Specific monitoring elements that would be implemented in connection with any of the action alternatives are included in Volume II, appendix J of this FEIS.

Alternative 2 - Modified

Alternative 2 - modified is the preferred alternative and it strives to balance the availability of motorized and non-motorized over-snow recreational opportunities, while minimizing impacts to natural and cultural resources. The following summarizes how the Forest Service would manage public OSV use in the Plumas National Forest under the modified proposed action:

- Designate approximately 858,436 acres of National Forest System lands for public cross-country OSV use (appendix A, table 3, figure 2). There are 2,753 miles of undesignated, unmarked, ungroomed, underlying roads and trails within designated OSV-use areas in this alternative.

- Designate areas with elevations generally above 3,500 feet for public OSV use.
- Designate approximately 143 miles of groomed OSV trails. In addition, there are 60 miles of groomed County Road miles, and 1.4 miles of private road groomed. (appendix A, table 4).
- Designate approximately 83 miles of ungroomed OSV trails. In addition, there are 7 miles of ungroomed trails on County Roads (appendix A, table 5).
- Forest-wide snow depth requirements for public OSV use would be established as follows:
 - a. Public, cross-country OSV use in designated OSV-use areas would be allowed when there are 12 or more inches of snow or ice covering the landscape, to avoid damage to surface and subsurface resources and comply with 36 CFR part 261.15;
 - b. Public OSV use on designated OSV trails would be allowed when there is adequate snow depth to avoid damage to natural and cultural resources. To avoid damaging resources on designated OSV trails with underlying roads, a minimum of 6 inches of snow or ice is typically needed. OSV trails to be designated for public OSV use or identified for OSV grooming in all alternatives would overlies existing paved, gravel, or native surface travel routes with the exception of four trail segments with a total length of 0.74 mile; and
 - c. The minimum snow depth for trail snow grooming to occur would be for 12 to 18 inches (consistent with California Snowmobile Grooming Standards).
- This alternative would designate 16 OSV crossings across the Pacific Crest National Scenic Trail (PCT) (Table S-2 and table 8; appendix A, table 6). Of this total, 12 of the OSV trails would be designated in locations where motorized routes shown on the Plumas MVUM cross the trail. Several locations have been recommended by local snowmobile enthusiasts. In coordination with the Tahoe National Forest, four proposed OSV crossings of the PCT at the shared forest boundary in the Lakes Basin Area would not use roads and would range in width up to 0.25 mile. These crossings are located in areas where OSV use is designated on either side of the PCT. OSV recreationists would need a way to get across the trail as OSV use along the PCT is prohibited by the National Trails System Act, P.L. 90-543, Section 7(c). Some of these proposed OSV crossings are wider than the width of a road because they are located in areas where snow conditions are highly variable during the course of a winter, for example areas prone to wind loading of snow and formation of cornices. These wider crossings give OSV recreationists options to select a safe crossing of the trail under constantly changing, variable snow loading conditions. In all cases, OSVs crossing the PCT would do so at 90 degrees to minimize the time and distance needed to cross the trail.
- An area not designated for OSV use would be applied to the PCT at Bucks Summit a congested, high-use staging area; the eastern side of the Middle Fork Wild and Scenic River to provide a noise buffer; and from the general area of Onion Valley to McRae Ridge to include the preservation of historic ski trails.

Areas not designated for OSV use adjacent to the PCT occur when the PCT overlies undesignated NFS lands or when NFS roads and/or motorized trails intersect, crisscross, or parallel the PCT. Undesignated NFS lands do not authorize OSV use and an additional area not designated for OSV use is not necessary. NFS roads and/or motorized trails that intersect, crisscross, or parallel the PCT within the previous 500-foot area not designated for OSV use originally displayed in the proposed action affects the nature and purpose of the PCT in the non-winter months..

In the Lakes Basin open areas, the area not designated for OSV use adjacent to the PCT was removed because the PCT parallels NFS road 22N46 and then crisscrosses two national forest administrative boundaries numerous times (Tahoe and Plumas). Generally, NFS lands are designated as open on both national forests and the Tahoe National Forest selected alternative does not include an area not designated for OSV use adjacent to the PCT. Given the PCT crisscrosses administrative boundaries, an area not designated for OSV use adjacent to the PCT on only the Plumas National Forest results in fragmented areas not designated for OSV use that are impractical for implementation.

The area not designated for OSV use adjacent to the PCT was modified in the La Porte open area and is discussed in trail segments below.

- ♦ Butte Bar Campground to the southeast corner of section 1 (T22N, R8E) - Remove entire area not designated for OSV use adjacent to the PCT because this section of the PCT overlies NFS lands that are not designated for cross-county OSV travel.
- ♦ Southeast corner of section 1 to intersection with NFS road 22N56 - Remove area not designated for OSV use adjacent to the PCT because NFS roads (23N65Y, 23N65YB, and 22N56) parallel the PCT within the previous 500-foot area not designated for OSV use originally proposed in the proposed action. The nature and purpose of the PCT is affected by these motorized routes in the non-winter months.
- ♦ Intersection with NFS road 22N56 to east side of private land in section 11 (T22N, R8E) - The Fowler Lake area overlaps with a special interest area or research natural area and overlies NFS lands that are not designated for cross-country travel, so a non-motorized buffer is not necessary within the Fowler Lake SIA. Two parcels of private land overlie with the PCT and are not designated for cross-country travel. An area not designated for OSV use is not necessary in these locations.
- ♦ Remove the area not designated for OSV use adjacent to the PCT from the intersection of NFS road 22N56 and then again from the eastern edge of the SIA/RNA to the eastern edge of the private land parcel in section 11. There are roads adjacent to PCT in Section 15.
- ♦ Private land in section 11 to intersection of Plumas County Road 511 (Forest Highway 120) - Remove area not designated for OSV use adjacent to the PCT because two designated, groomed trails (NFS road 22N60 and Plumas County Road 120) crisscross and parallel the PCT. These roads are within the previous 500-foot area not designated for OSV use originally proposed in the proposed action. The nature and purpose of the PCT is affected by these motorized routes in the non-winter months.
- ♦ Plumas County Road 511 to Intersection of NFS Road 22N82X - Remove area not designated for OSV use from County Road 511 to the PCT's intersection with NFS Road 22N82X because these roads crisscross and parallel the PCT. These roads are within the previous 500-foot area not designated for OSV use originally proposed in the proposed action. The nature and purpose of the PCT is affected by these motorized routes in the non-winter months.
- ♦ Maintain an area not designated for OSV use adjacent to the PCT at the intersection with NFS road 22N82X, around the northeast side of Pilot Peak, and adjacent to the PCT along Bunker Hill Ridge, southeast to where the PCT is within the Semi-primitive Prescription (Rx-8), near Stafford Mountain. A widened area not designated for OSV use along the PCT meets the nature and purpose of the trail, provides a noise barrier, and recognizes historic uses of the trail as the 'Lost Sierra Ski Traverse.'

The area not designated for OSV use adjacent to the PCT was modified in the Bucks open area and is discussed in two trail segments below.

- ◆ Bucks Summit - From Bucks Summit staging area off of Plumas County Road 414, heading south along the PCT, increase the areas not designated for OSV use in between two designated and groomed OSV trails: NFS roads 24N29Y and Plumas County Road 119 (Big Creek Road). On the west side of the PCT, the area not designated for OSV use starts along the ridge in between NFS road 24N29Y and the PCT. On the east side of the PCT, the area not designated for OSV use extends from the Bucks Summit trailhead to the Plumas County Road 119. NFS lands adjacent to Plumas County Road 414 near Deadwood Creek and adjacent to private lands were also included in the area not designated for OSV use.
- ◆ The Bucks Summit trailhead receives both non-motorized and motorized uses. The area not designated for OSV use provides a noise barrier along the PCT in a congested area. This segment of the PCT provides about 3 miles of gentle terrain to the south of Bucks Summit.
 - Intersection of NFS road 24N29Y and Plumas County Road 119 (Big Creek Road) to Lookout Rock - Remove entire area not designated for OSV use adjacent to the PCT because motorized roads and trails intersect and parallel the PCT within the previous 500-foot area not designated for OSV use originally proposed in the proposed action. The nature and purpose of the PCT is affected by these motorized routes in the non-winter months.
 - Lookout Rock to Butte Bar Campground - Remove entire area not designated for OSV use adjacent to the PCT because a buffer or zone in this section of the PCT is not necessary since it overlies NFS lands that are not designated for cross-country OSV travel. This area is also a Semi-Primitive area (Rx-8) from the 1988 PNF LRMP, and there are very few existing roads. There are no roads or motorized trails in the vicinity of the PCT.
 - In the Chips open area, the area not designated for OSV use adjacent to the PCT was removed because a buffer or zone in this section of the PCT is not necessary since it overlies NFS lands that are not designated for cross-country OSV travel.
- OSV use would be restricted to designated trails only when designated trails pass through bald eagle territories.
- Class 1 OSVs would be allowed on all designated OSV trails and areas. Class 2 OSVs would only be allowed on designated OSV trails available for grooming. OSV class definitions can be found in appendix K of this FEIS.

Alternative 3

This alternative addresses issues related to the availability of non-motorized over-snow recreational opportunities, quality of the motorized and non-motorized over-snow recreation experiences, effects to air quality, and emphasizes non-motorized recreation. The following summarizes how the Forest Service would manage public OSV use in the Plumas National Forest under this alternative:

- Designate approximately 600,542 acres of National Forest System lands or public cross-country OSV use (appendix A, table 7, figure 3). There are 1,499 miles of undesignated, unmarked, ungroomed, underlying roads and trails within designated OSV-use areas in this alternative.
- Designate areas with elevations above 5,000 feet for public OSV use.

- Designate approximately 220 miles of trails would be designated for OSV use and available for grooming. This includes 73 additional miles of trail that are not part of the existing groomed trail network and would be available for grooming if additional funding became available (appendix A, table 8).
- Forest-wide snow depth requirements for public OSV would be established, as follows:
 - a. Public, cross-country OSV use in designated OSV-use areas would be permitted when there are 18 or more inches of snow or ice covering the landscape, to prevent impacts to surface and subsurface.
 - b. Public OSV use on designated trails would be permitted when there are 18 or more inches of snow covering the trail to prevent impacts to surface and subsurface resources.
 - c. The minimum snow depth for snow trail grooming to occur would be 12 inches.
- This alternative would designate nine OSV trails across the Pacific Crest National Scenic Trail (PCT) (appendix A, table 9). Motorized routes (roads or trails) identified on the Plumas National Forest's MVUM and where NFS motorized trail 12E39 joins the PCT (west of Gold Lake) would be utilized.
- An area adjacent to the PCT would not be designated for cross-country OSV travel to minimize noise disturbance to non-motorized recreationists on the PCT and to retain the non-motorized characteristics of this national scenic trail. Areas where the PCT is in close proximity to designated OSV trails available for grooming would be designated for OSV use.
- OSV use would be restricted to the designated trails only when designated trails pass through bald eagle territories.

Alternative 4

This alternative, submitted by Blue Ribbon Coalition and Sierra Access Coalition in accordance with the settlement agreement in the case of *Snowlands Network et al. v. U.S. Forest Service*, addresses the significant issue of the availability of motorized over-snow recreation opportunities. The areas designated for OSV use and the designation of OSV trails available for grooming would be maximized. Funds for grooming are available through state grants and that additional funds for new grooming are not anticipated. This alternative would require additional facilities to support increased grooming. Evaluation of these additional facilities is beyond the scope of this project. This alternative also proposes to change the management of the currently non-motorized cross-country ski trails at Gray Eagle Creek and Bucks Creek Loop to provide for OSV use in these areas. The following summarizes how the Forest Service would manage public OSV use in the Plumas National Forest under this alternative:

- Designate approximately 1,160,793 acres of National Forest System lands for public cross-country OSV use (appendix A, table 10, figure 4). There are 2,610 miles of undesignated, unmarked, ungroomed, underlying roads and trails within designated OSV-use areas in this alternative.
- Designate approximately 577 miles of trails available for grooming. This mileage includes the addition of 350 miles of trails that would be available for grooming should additional funding become available. These additional miles include an extension of the Mill Creek OSV trail to allow for a safe turnaround for the grooming machine, and the Bucks Lake groomed trail system into the Fourth Water and Tamarack areas, as well as historically groomed and potential trails on existing roads (appendix A, table 11, figure 4).

- Forest-wide snow depth requirements for public OSV use would be established, as follows:
 - a. Public, cross-country OSV use in designated OSV-use areas would be permitted when there are 12 or more inches of snow or ice covering the landscape, to prevent impacts to surface and subsurface resources.
 - b. There would be no minimum snow depth requirement for designated trails.
 - c. There would be no minimum snow depth requirement for grooming to occur.
- Approximately 5 miles, of the existing 85 miles, of non-motorized trail currently not available for OSV use, would be designated for OSV use.
- Areas adjacent to the PCT would be designated for cross-country OSV travel and would not include an area not designated for OSV use.
- This alternative would designate 31 OSV trails across the Pacific Crest National Scenic Trail where motorized routes shown on the Plumas MVUM cross the trail and where recommended by local snowmobile enthusiasts (appendix A, table 12). This includes 25 crossings that overlie roads or trails and 6 linear features that would be wider than a road.

Alternative 5

Alternative 5 addresses all three significant issues: 1b) availability of non-motorized over-snow recreational opportunities; 1c) quality of motorized and non-motorized over-snow recreation experiences; 2) effects to air quality; and 3a and 3b) effects to terrestrial and aquatic wildlife and botanical resources. The following summarizes how the Forest Service would manage public OSV use in the Plumas National Forest under this alternative:

- Designate approximately 651,877 acres of National Forest System lands for public cross-country OSV use (appendix A, table 13, figure 5). There are 1,660 miles of undesignated, unmarked, ungroomed, underlying roads and trails within designated OSV-use areas in this alternative.
- Designate areas with elevations above 5,000 feet for Public OSV use.
- Designate approximately 210 miles of trails for OSV use and available for grooming (appendix A, table 14).
- Approximately 5.2 miles of designated trail would not be available for grooming; this includes 1.6 miles of trail that is currently groomed (appendix A, table 15).
- Forest-wide snow depth requirements for public OSV would be established, as follows:
 - a. Public, cross-country OSV use in designated OSV-use areas would be allowed when there are 24 or more inches of snow or ice covering the landscape, to prevent impacts to surface and subsurface resources;
 - b. Public OSV use on designated OSV trails would be allowed when there are 12 or more inches of snow or ice covering the trail; and
 - c. Follow California State Department of Parks and Recreation Off-Highway Motor Vehicle Recreation Division snow depth standards for grooming, currently requiring 12 to 18 inches of snow accumulation.
- This alternative would designate 16 OSV trails across the Pacific Crest National Scenic Trail (PCT) to connect designated open OSV areas (appendix A, table 16). OSV trails would use

motorized routes (roads or trails) identified on the Plumas National Forest's MVUM and would be the width of the road (approximately 14 feet).

- An area within 500 feet of centerline of the PCT would not be designated for cross-country OSV travel to minimize noise disturbance to non-motorized uses on the PCT and to retain the non-motorized characteristics of this national scenic trail. OSV use across the PCT would be restricted to designated OSV trails only.
- Alternative 5 would include the same bald eagle restricted areas as the modified proposed action (alternative 2 - modified). OSV use would be restricted to the designated trails only when designated trails pass through bald eagle territories.
- OSV use would be restricted to the designated trail available for grooming only when designated trails pass through or are adjacent to northern goshawk breeding areas.
- Class 1 OSVs would be allowed on all designated OSV trails and areas. Class 2 OSVs would only be allowed on designated OSV trails available for grooming. Class of vehicle definitions can be found in appendix K.

Features Common to all Action Alternatives

These features would be included in all action alternatives.

OSV Use

- OSV use on NFS trails and in areas on NFS lands is prohibited unless designated (consistent with 36 CFR 212.81).
- OSV use in designated areas and trails is not allowed on open, frozen, or flowing water (National BMP REC-7).
- Install interpretive signs at popular trailheads, staging areas, and parking areas that provide information on the effects of OSV emissions on air and water quality (National BMP REC-7).
- Apply the National Best Management Practices (BMPs) to protect water resources on NFS lands from snowmobile pollution (USDA Forest Service 2012): "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; use and enforce closure orders to mitigate effects when adverse effects to soil, water quality, or riparian resources are occurring; [For trailheads, parking areas 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 waterbodies to provide adequate pollutant filtering."
- Enforce the minimum snow depth requirements by issuing a citation if use is occurring in violation of the minimum snow depth requirement included as OSV use designation provisions (enforceable pursuant to 36 CFR 261.14).
- The Forest Service may temporarily prohibit OSV use of areas or trails for other types of management activities such as contracted timber or vegetation management or other resource concerns.

Trail Grooming

- All fuel and other chemicals shall be stored at the groomer storage facilities or outside riparian areas.

- All equipment maintenance and refueling shall occur at the storage facilities or outside riparian areas.
- Spill containment equipment shall be kept at the storage facilities.
- Trails would be groomed to a minimum width of 10 feet and typically up to 14 feet wide. Trails may be groomed up to 30 feet wide in the more heavily used areas such as near trailheads.
- Groomed snow trail width is determined by a variety of factors such as width of the underlying road bed, width of the grooming tractor, heavy two-way traffic on the trail, and trail corners.
- Snow trail grooming would be conducted in accordance with the 1997 California Snowmobile Trail Grooming Standards established by the California Off-Highway Motor Vehicle Recreation (OHMVR) Commission (1997 Jones, B.), 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. Operate the snow tractor on approved designated trails only. 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 as prescribed by the Forest Service handbook for class 4 trails.
 - ◆ Follow California State Department of Parks and Recreation Off-Highway Motor Vehicle Recreation Division snow depth standards for grooming, currently requiring 12 to 18 inches of snow accumulation.
 - ◆ 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.

Pacific Crest Trail

The PCT would be closed to OSV travel. OSV trails would be designated to provide for crossing of the PCT. The National Trail System Act, P.L. 90-543, Sec 7(c) prohibits the use of motorized vehicles by the general public along any national scenic trail. 36 CFR § 261.20 states: "It is prohibited to use a motorized vehicle on the Pacific Crest National Scenic Trail without a special-use authorization."

Wildlife

- Cross-country travel by over-snow vehicles would not be designated within 50 feet of flowing water within critical habitat areas for Sierra Nevada yellow-legged frog.
- OSV use may be restricted seasonally during breeding or migration periods for federally listed or Forest Service Sensitive species in identified habitat areas.
- Temporary closure of an OSV area or trail may be necessary if disturbance to wildlife species is documented.

Monitoring

Part 212, Subpart B, Section 212.57 of the Travel Management Rule (Federal Register Vol. 70, No. 216, November 9, 2005) requires that each administrative unit of the National Forest System monitor the effects of motor vehicle use (including OSV use) on designated roads and trails and in designated areas under the jurisdiction of that responsible official, consistent with that unit's land management plan, as appropriate and feasible. This monitoring requirement applies to any areas or trails designated for OSV use in any decisions made as a result of this project, pursuant to 36 CFR § 212.81(d) of the final Use By Over-Snow Vehicles (Travel Management Rule, Federal Register Vol. 80, No. 18, January 18, 2015).

To achieve compliance with Section 212.57, the Plumas OSV interdisciplinary team developed monitoring procedures to determine the effects of OSV use within the areas designated for OSV use and on the designated OSV snow trails. The monitoring procedures were designed to be able to:

- (1) measure the effectiveness of the designations in avoiding or minimizing resource damage;
- (2) measure public compliance within the OSV area and snow trail designations;
- (3) document enforcement of the OSV area and snow trail designations; and
- (4) measure use levels and patterns of use and identify concentrated use areas.

Effectiveness Monitoring

- 1.1 During routine winter recreation field visits, recreation personnel and forest protection officers monitor staging areas, trailheads, groomed trails, and other areas of concentrated use for public safety concerns. Site-specific controls such as speed limits; segregated access points for motorized and non-motorized uses; increase visitor information; or increased on-site patrol personnel are implemented as needed annually.
- 1.2 During routine winter recreation field visits, recreation personnel and forest protection officers monitor OSV use and document any signs of damage occurring to forest resources. Observations of the impacts identified below would constitute resource damage, but is not limited to the following:

Soil and Water

- ◆ Evidence of visible rutting, churning, erosion (loss of soil cover or forest floor layers missing, loss of topsoil, evidence of rilling), compaction, or a combination of these things
- ◆ Road and trail surfaces are bare of snow and the surface is disturbed by OSVs
- ◆ As a result of ground disturbance, there is visible turbid runoff
- ◆ Broken and trampled vegetation especially near streams
- ◆ Visible oil or unburned fuel deposits observed
- ◆ OSVs are operating in or across open water

Aquatic Resources

- ◆ OSVs are operating in or across open water
- ◆ Direct vehicle collisions with aquatic species that cause injury or mortality
- ◆ Stream crossings damaging banks or displacing streambed features (for example, rocks, logs, debris)

- ♦ Evidence of soil, water, and vegetation impacts (as outlined under “Soil and Water” impacts, above), particularly in riparian areas or near water.
- ♦ Snow compaction impacts to overwintering sites (when spaces can be observed under the snow that were made visible by OSV tracks or notice dead animals under the snow).
- ♦ Noticing cross-country use with less than 12 inches of snow depth or trails that show patches of dirt along with the snow.
- ♦ Noticing gasoline or oil spills especially in areas where runoff might drain the spillage into waterways.

Terrestrial Wildlife

Observations of direct impacts to species:

- ♦ Direct vehicle collisions with wildlife species that cause injury or mortality
- ♦ Snow compaction impacts to den sites or prey habitat (when spaces can be observed under the snow that were made visible by OSV tracks or notice dead animals under the snow).
- ♦ Temporary or permanent displacement of species during OSV use (observance that a species that regularly uses an area is not present during OSV use)
- ♦ Displacement of populations or individual animals from a route, related to human activities (observance of deer fleeing from OSVs or people actively chasing species with their OSVs).
- ♦ Compaction and crushing of host or edible plant species.
- ♦ Observing OSV use in designated open areas and trails that results in the underlying ground (e.g., soil) showing along with the snow.
- ♦ Noticing gasoline or oil spills especially in areas where runoff might drain the spillage into waterways.

Botany

- ♦ TES tree or shrub species are directly damaged by contact with OSVs (skis, tracks, paddle tips, or even front end could damage individuals) – could be minimal, and unintentional, or otherwise.
- ♦ Ground vegetation, soil, or both is disturbed, due to OSV over thin snow cover in areas where TES plants occur (none are currently identified).
- ♦ Woody plants (trees or shrubs) are broken and scarred, or ground vegetation and soil is disturbed,
- ♦ Stream crossings damage banks or displace streambed features (rocks, logs, debris).
- ♦ Spilled oil or fuel within TES plant occurrences.
- ♦ The intentional or negligent dissemination of invasive plant species.

Compliance Monitoring

- 2.1 During routine winter recreation visits, recreation personnel and forest protection officers monitor wilderness boundaries and other designated non-motorized recreation areas near or adjacent to designated OSV areas or designated OSV snow trails to document any signs of incursions occurring (e.g., tracks, or observed use outside of designated area or trail). Coordination, user educational materials, or enforcement actions will be increased as needed.
- 2.2 Locations in the Forest where OSV use is restricted to designated OSV snow trails (cross-country OSV use is prohibited) will be monitored to ensure public OSV use is restricted to the footprint of the designated trail and OSV use does not encroach into areas adjacent to the trail that may not have been designated for OSV use.
- 2.3 Locations in the Forest where cross-country OSV use has been designated (i.e., within OSV-use areas) will be monitored to ensure public OSV use remains within the designated area.
- 2.4 Non-motorized trails including the Pacific Crest Trail, Buck's Creek Loop Trail, Grey Eagle Creek Trail, and Lakes Basin Ski Trails will be monitored to ensure that public OSV use is not occurring in these areas that are not designated for OSV use.
- 2.5 Snow depth will be monitored to ensure the minimum snow depth requirements are being met. Recreation staff will continue to monitor minimum snow depth at trailheads, staging areas, and parking areas to authorize trail grooming activities to commence. Snow depth stakes and OSV regulations will be added to plowed trailhead areas that access designated OSV trails and areas as an indicator and education tool for OSV recreationists. Snow depth measurements will be located in areas that are relatively uniform and undisturbed, and will consist of a series of measurements located on the landscape in areas located away from tree wells, fence lines, wind-blown mounds, etc. Periodic monitoring of snow depths in more remote use area locations will help determine if access point snow depth measurements correlate with conditions on the landscape.
- 2.6 Staff conducting the monitoring will assess: (1) if the minimum snow depth requirements are being met; (2) if resource damage is occurring (below, at, or above the minimum snow depth requirements); (3) the extent of any observed damage; (4) what, if anything, can be done to address use occurring on snow depths below the minimum snow depth requirements; and (5) snow depth monitoring will consider best management practices (BMPs) and will evaluate whether OSV use is impacting the roads, routes, or soils that underlie trail surfaces and OSV-use areas.

Enforcement

- 3.1 The Forest will enforce the OSV use designations using a variety of approaches: 1) education; 2) warnings; 3) citations. These approaches will be used, if during routine winter recreation field visits, recreation and FPO staff observe 1) OSV use is occurring on NFS lands outside of the designated OSV-use area or trails; 2) OSV use is occurring when snow depths are below the designated minimum snow depth requirement; 3) OSV use is observed to be causing resource damage.
- 3.2 Enforcement through education has proved to be a successful way in which to engage the public recreating on NFS lands. This approach sets the framework to allow OSV use to occur while ensuring the land is managed in a way as “[t]o sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations.” Providing on-site communication with users demonstrates directly to the public where OSV use is

designated to occur, why they are not in compliance with these designations, and shares information that will enable the user(s) to ensure compliance and resource protection in the future.

- 3.3 Written warning accomplishes two main objectives: 1) documenting the encounter between recreation or forest protection officer staff and an OSV recreationist; and 2) provides the OSV recreationist with a written, physical reminder of the encounter including a description of how they were in violation and how to conduct their OSV use in the future to remain in compliance with the Forest's OSV use designations and resource values.
- 3.4 Citations will be written on an individual, situational basis. Education and warnings are typically used first and for a short duration after the publication of the OSVUM. Citations (36 CFR 261.14) can be written for any OSV use not in accordance with the OSV use designations established pursuant to 36 CFR 212.81 on an administrative unit or ranger district of the National Forest System and identifications of OSV use designations on the OSVUM. Citations (36 CFR 261.9(a); 36 CFR 261.9(c)) can also be written for any OSV use that is observed to be causing (a) damage to any natural feature or other property of the United States; or (c) damage to any plant species that is classified as threatened, endangered, sensitive, or rare.
- 3.5 Citations written for violations of 36 CFR 261.14 including OSV use occurring on National Forest System lands outside of the designated OSV-use areas or designated OSV use trails will be monitored annually.
- 3.6 Formal public complaints, reports of resource damage caused by OSV use, warnings, and citations are entered into the Law Enforcement and Investigations Management Attainment Reporting System (LEIMARS), a computerized database to collect information on crimes and violations that occur on National Forest System lands. LEIMARS was designed to provide agency managers with a means to identify and monitor law enforcement activities and provide a method to record and analyze information (Forest Service Manual 5300).

Use Levels and Patterns of Use

- 4.1 A system for tracking observed use levels and patterns of use (for example, concentrated use areas) was developed by modifying an existing OSV program patrol log. Recreation personnel and forest protection officers who routinely conduct winter recreation field visits, will use the modified log and document levels and patterns of use. Observations made from parking or staging areas, or trailheads; while riding a snowmobile; or while cross-country skiing or snowshoeing would be documented on the modified form. This information will be provided to the Forest's Public Services Staff Officer and Environmental Coordinator and stored at the Supervisor's Office in Quincy, California.

Comparison of Alternatives

Table 8. Comparison of alternatives

*All area size estimates are approximate and are rounded to the nearest whole number.

	Alternative 1 No Action (Current Management)	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5	Alternative 6** Proposed Action (2015)
NFS lands within the Plumas National Forest - acres	1,204,750	1,204,750	1,204,750	1,204,750	1,204,750	1,204,750
OSV Use Designations						
Allowed OSV Use (% of total NFS lands):	95%	71%	50%	96%	54%	97%
* Designated Areas – acres*	1,147,825***	858,436	600,542	1,160,793	651,877	1,162,000
-- Miles of unmarked, non-designated trails available within designated OSV-use areas	2,879	2,753	1,499	2,610	1,660	
* Designated Trails – total miles	227	226	220	577	210	276
-- Available for Grooming – miles existing	203	143	147	141	209.6	203
-- Available for Grooming – miles newly proposed	0	0	73	436	0.45	73
-- Not Available for Grooming* - miles	24	83	0	0	5.2	0
Minimum Snow Depth for Off-Trail, Cross-Country OSV Use	None	12	18	12	24	12
Minimum Snow Depth for OSV Use on Designated Trails	None	6****	18	None	12	None
Minimum snow Depth for Grooming of trails - inches	12-18	12-18	12	None	12-18	12-18
Areas Designated for OSV use – acres*						
Antelope	135,048	115,944	93,098	135,290	96,002	Did not specify
Bucks	243,237	136,876	65,607	243,964	65,373	Did not specify
Canyon	88,960	58,009	16,395	91,740	21,105	Did not specify
Davis	177,218	138,493	113,425	181,118	124,249	Did not specify
Frenchman	277,225	263,958	223,980	278,044	256,991	Did not specify
Lakes Basin	46,729	33,480	25,701	46,897	26,757	Did not specify
La Porte	179,407	111,676	62,336	183,742	61,399	Did not specify
Pacific Crest Trail Crossings						
Number of crossings	0	16	9	31	16	24
Crossings on roads/trails	-	12	9	25	16	-
Linear crossings not associated with a road/trail	-	4	0	6	0	-

**Alternative 6 (Proposed Action, 2015) is not carried forward for detailed analysis. It is replaced with alternative 2 - modified

***There are no areas “designated for OSV use.” OSV use is currently allowed on 1,147,825 acres.

****Public OSV use on designated trails with underlying roads, typically requires a minimum of 6 inches to avoid resource damage.

Suggested Alternatives or Alternative Components Considered

The responsible official carefully considered each of the public suggestions below to determine whether the suggestion should be carried forward into detailed analysis in the EIS or dismissed from further consideration. Suggestions carried forward into detailed analysis could become a new alternative or part of a revision to the proposed action.

For an alternative to be analyzed in detail in the EIS, it must meet the purpose and need for action, must address one or more significant issues, and address unresolved conflicts related to the proposed action. Alternatives should be considered, even if outside the jurisdiction of the agency (40 CFR 1502.14(c)). Reasonable alternatives include those that are practical or feasible from a technical and economic standpoint. Alternatives not considered in detail in the EIS may include, but are not limited to, those that fail to meet the purpose and need, are technologically infeasible or illegal, or would result in unreasonable environmental harm.

The suggested alternatives and the rationale for either incorporation into the range of alternatives for detailed analysis, or elimination from detailed study are summarized below.

Alternative 6: Proposed Action

The following description summarizes the Forest Service proposed action as it was shared with the public in the September 2015 Notice of Intent (NOI). This alternative was not carried forward for detailed analysis because it was replaced by alternative 2 - modified (the modified proposed action). The complete original proposed action description is available in the project record. The actions proposed were as follows:

1. To designate OSV use on National Forest System roads, National Forest System trails, and areas on National Forest System lands within the Plumas National Forest where snowfall depth is adequate for that use to occur. OSV use would be designated on most of each of the three ranger districts in the Forest. All existing OSV prohibitions applying to areas or trails would continue. OSV use that is inconsistent with the designations made under this project would be prohibited under 36 CFR §261.14. This proposal would designate approximately 276 miles of trail for OSV use. It would designate approximately 1,162,000 acres for cross-country OSV use. Existing ungroomed trails for OSV use under National Forest System jurisdiction that are located within areas that would be designated for cross-country OSV use would not be designated separately as trails for OSV use, since OSV use here would be permitted under the “area” designation.
2. To identify approximately 276 miles of OSV trails for grooming in the Plumas National Forest for OSV use. This includes 73 miles of trails for OSV use which are not currently groomed. Grooming these additional miles would require increased funding from the California OHMVR Division, which is not currently available, but these trails would be eligible for grooming should funding become available. The network of groomed OSV trails in the Plumas National Forest is connected to a network of approximately 59 miles of currently groomed OSV trails located on county roads (Plumas and Sierra Counties) within the Plumas National Forest, as well as a network of groomed OSV trails located off the Plumas National Forest in the Tahoe National Forest to the south. Trail mileages are estimates only and we are currently reviewing the status of trails where there is uncertainty regarding Forest Service jurisdiction or grooming authorization, such as trails located on private property, or county roads that groomed trails have historically passed through.

Grooming of trails where the Plumas National Forest does not have jurisdiction would require authorization from the county or other entity with jurisdiction over these trails.

3. To allow grooming of OSV trails, consistent with historical grooming practices, when unpacked snow depths equal or exceed 12 inches, and formally adopt California State Parks' OSV snow grooming standards requiring a minimum of 12 inches of snow depth before grooming can occur.
4. To implement a forest-wide snow depth requirement for OSV use that would provide for public safety and natural and cultural resource protection by designating OSV use, both on-trail and off-trail, when unpacked snow depths equal or exceed 12 inches. Exceptions would be allowed in order for OSVs to access higher terrain and deeper snow when snow depths are less than 12 inches, as long as this use does not cause visible damage to the underlying surface. Most groomed OSV trails are co-located on underlying paved, dirt, and gravel National Forest System roads and trails.
6. To designate 24 locations where OSVs would be designated to cross the Pacific Crest National Scenic Trail.

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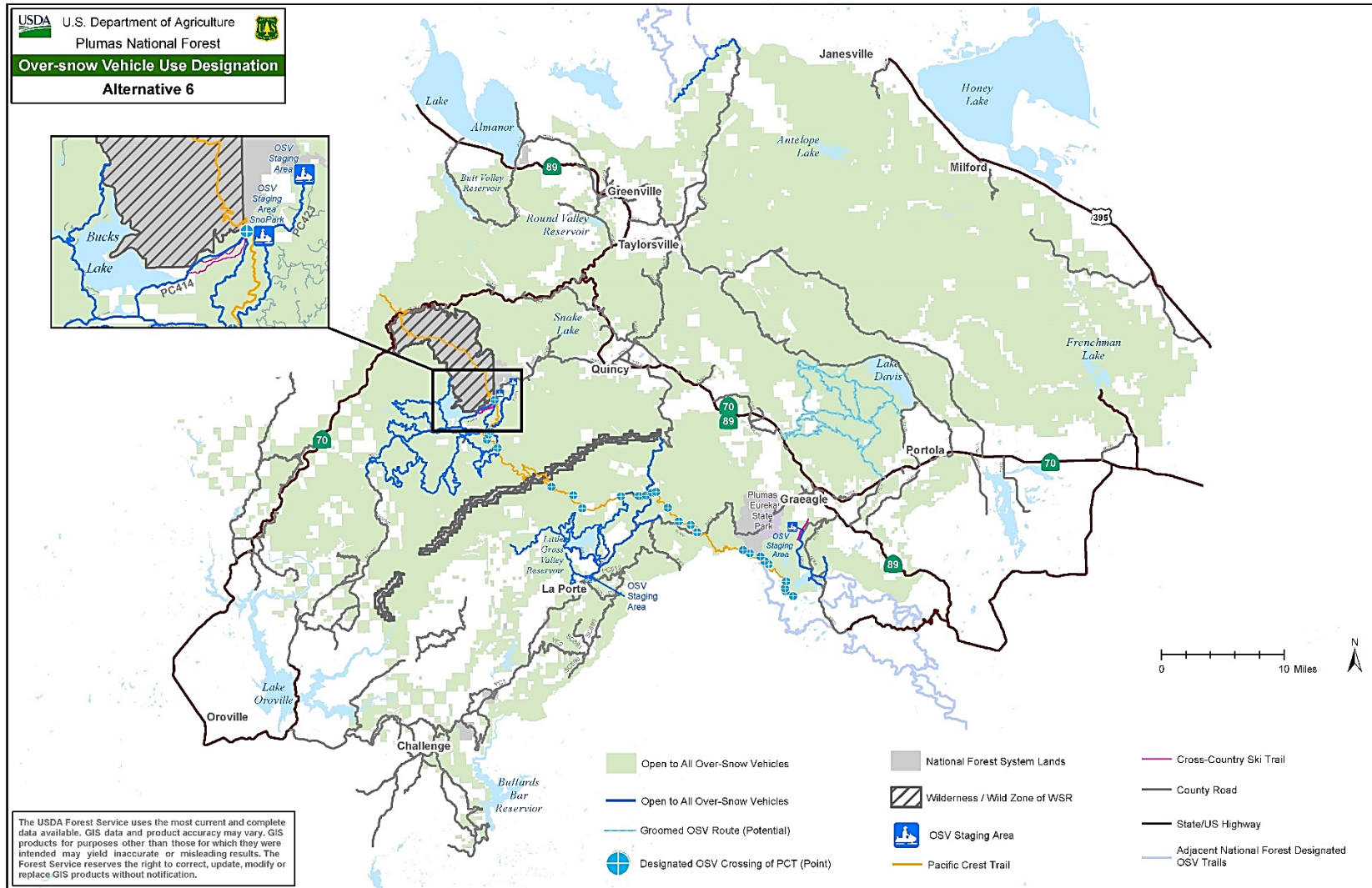


Figure 2. Alternative 6, proposed action (2015)

Alternatives or Alternative Components Integrated into Alternatives

Ensure OSV use designations avoid municipal watersheds.

There are no Forest Service designated municipal watersheds in the project area; however, the majority of water that flows off of National Forest System lands contributes to drinking water supplies for the State of California.

Ensure monitoring and enforcement are part of the proposal.

Monitoring and enforcement are critical to the success of implementation. A monitoring discussion is included in the FEIS.

Do not designate OSV use across open or flowing water

This planning effort addresses OSV use on National Forest System lands. Therefore, OSV use on open water, such as lakes and ponds, is beyond the scope of this project, regardless of whether they are frozen. In all action alternatives (alternatives 2 - modified through 5), over-snow vehicle use would not be designated on open or flowing water.

Do not designate OSV use in riparian areas

We considered this suggestion and have developed alternatives that restrict OSV use when there is not adequate snow to prevent resource damage. We have also added a monitoring protocol to focus on monitoring OSV use in sensitive areas (appendix J).

Consider an alternative with an emphasis on opportunities for motorized over-snow use

Alternative 4, which emphasizes opportunities for winter motorized recreational use, is included for detailed analysis in the FEIS. However, not all aspects of this suggested alternative are within the scope of the analysis. Proposed components that are not included are described below under Alternative Components Eliminated from Detailed Analysis.

Consider an alternative with an emphasis on opportunities for non-motorized over-snow uses

Alternatives 3 and 5 have been developed to address this suggestion and are included for detailed analysis in the FEIS. However, not all aspects of the suggested alternative are within the scope of the analysis. Proposed components that are not included are described below under alternative Components Eliminated from Detailed Analysis.

Consider not designating OSV use adjacent to the Pacific Crest National Scenic Trail; this would promote safety, reduce conflicts between motorized and non-motorized uses, and ensure consistency with the Pacific Crest National Scenic Trail Comprehensive Plan (USFS 1982). The Pacific Crest National Scenic trail should be illustrated on Over-snow Vehicle Use Maps.

In alternatives 2 - modified, 3 and 5, an area adjacent to the Pacific Crest National Scenic Trail (PCT) would not be designated for cross-country OSV travel to minimize noise disturbance to non-motorized uses on the PCT and to retain the non-motorized characteristics of this National Scenic Trail. The Over-snow Vehicle Use Map will include the Pacific Crest National Scenic Trail. Maps for each of the alternatives in the FEIS include the PCT.

Designate OSV crossing trails across the Pacific Crest National Scenic Trail, using the same crossings as designated by wheeled motorized vehicles shown on the subpart B Motor Vehicle Use Map.

This concept is included in all alternatives except for alternative 1, no action. Alternatives 2 - modified, 3, 4, and 5 all incorporate OSV trails across the Pacific Crest Trail.

The Forest Service and the local counties should provide public outreach and education on proper OSV use to avoid environmental impacts, reduce user conflicts, and promote operator safety.

Increased public outreach and education is necessary to inform the public of changes to management of OSV use on National Forest System lands. Public outreach and education will be incorporated into the implementation of the decision.

Forest Service should consider whether to designate areas or trails by "class of vehicle" and/or "time of year" as provided for in the Travel Management Rule, Subpart C.

Alternatives 2 - modified and 5 include designations specific to Class 2 vehicles. None of the alternatives designate OSV use by time of year.

Use the best available data to determine appropriate restrictions on OSV use for wildlife protections

The Forest Service has used the best available data for analysis and project implementation.

Consider an alternative that addresses bald eagles thriving under snowmobile noise conditions, as the population of eagles on the west side of Lake Davis has historically done.

We recognize the historic presence of bald eagles in the Lake Davis area, and have analyzed the effects of each of the alternatives to this resource. Several of the alternatives incorporate specific management requirements to be consistent with the Plumas National Forest Land and Resource Management Plan and the U.S. Fish and Wildlife Service National Bald Eagle Management Guidelines (USFWS 2007). Under alternatives 2 - modified, 3, and 5, OSV use would be allowed on designated trails and would not be designated for cross-country use in the bald eagle primary use areas. Under alternative 4, OSV use would be allowed except within restricted areas surrounding known bald eagle nest locations.

For minimum snow depth, include a recommendation rather than minimum depth requirement. Allow OSV use only when snow is of sufficient depth to avoid damage to Forest resources which will vary depending on snow conditions.

We received a range of snow depth suggestions from commenters during the process. Snow depth varies by the alternatives analyzed in detail in the FEIS. Some of the alternatives include requirements and others include guidelines to avoid damage to underlying resources.

Ensure that the process used to measure and enforce minimum snow depths are equitable and that entire areas are not restricted to OSV use based on a snow depth measurement taken at just one trailhead

We considered this suggestion and have carried this issue forward for detailed analysis in the FEIS.

Identify areas that have sufficient snow

Subpart C requires that areas designated for OSV use have adequate snow. Alternatives 2 - modified, 3, and 5 address the need for adequate snow.

Analyze the effects of OSV use on threatened, endangered, and sensitive wildlife species including the Sierra Nevada yellow-legged frog, California red-legged frog, California spotted owl, and northern goshawk.

The wildlife section of chapter 3 in the FEIS includes analysis of the effects of OSV use on these species.

Consider these specific areas or considerations for OSV use opportunities. These are areas important to motorized over-snow users.

- Allow for a historic motorized winter recreation over the snow vehicle transport area to travel from the Gold Lake Snowmobile Staging Area to the La Porte Snowmobile Staging Area.
 - ♦ OSV travel from the Gold Lake staging area to the La Porte staging area would be possible under alternatives 2 - modified and 4, which is analyzed in the FEIS.
- Extend the OSV trail system, tying Bassets junction with La Porte and Bucks Lake.
 - ♦ This is included in alternative 4, which is analyzed in the FEIS.
- Consider an alternative to designate OSV use in McCrae Meadows and the Nelson Creek areas.
 - ♦ Alternative 4 would designate OSV use in McCrae Meadows and Nelson Creek drainage. Alternative 2 - modified would designate OSV use in the Nelson Creek drainage.
- Consider the Beartrap area, west of Lakes Basin Recreation Area; and the Lakes Basin area except north of Mt. Washington and Florentine Canyon for a designated OSV-use area.
 - ♦ These areas would be designated for OSV use under alternative 4, which is analyzed in the FEIS.
- Review and incorporate Lake Davis area suggested grooming routes identified in 2012/2013 assessment in the Beckwourth Ranger District (map exists).
 - ♦ Alternative 4 includes over 500 miles of additional trails that would be designated for OSV use and available for grooming if increased funding becomes available.
- Design designated OSV-use areas utilizing ridges and access routes to better separate motorized and non-motorized.
 - ♦ Designated OSV-use areas are delineated by ridges, rivers, and roads.
- Consult with OSV recreation groups to develop reasonable corridors to allow passage of OSVs to designated OSV-use areas
 - ♦ Alternative 4 was developed in coordination with Sierra Access Coalition and maximizes the designation of OSV-use areas.

Consider not designating the following areas for OSV use. These include areas that are important to non-motorized over-snow users, to wildlife, or to other resources.

- Semi-Primitive Non-Motorized areas –
 - ♦ In alternatives 3 and 5, semi-primitive areas are analyzed as not designated for OSV use. Alternative 2 - modified would designate portions of the Beartrap and Keddie Ridge semi-primitive areas for OSV use, to allow OSV recreationists continuous riding opportunities between Lakes Basin and La Porte (for Beartrap) and between the Plumas and Lassen National Forests (for Keddie). The remaining semi-primitive areas would not be designated for OSV use under alternative 2 - modified.
- Research Natural Areas (Mud Lake and Wheeler Peak units)
 - ♦ Alternatives 2 - modified, 3, and 5 analyze for not designating OSV use in the research natural areas (Mud Lake and Wheeler Peak units). The Mt. Pleasant RNA is within the Bucks Lake Wilderness and would not be designated for OSV use in any alternative.
- Special Interest Areas
 - ♦ Alternatives 3 and 5 analyze special interest areas as not designated for OSV use. Alternative 2 - modified would designate OSV use only in the Little Volcano SIA and Little Last Chance Canyon SIAs.
- Big game winter range
 - ♦ In alternatives 2 - modified, 3, and 5, big game winter range is analyzed as not designated for OSV use.
- Sensitive species nesting habitat
 - ♦ Under all of the action alternatives, some sensitive species nesting habitat is not designated for OSV use because sensitive species nest in areas not designated for other reasons. Alternative 5 includes areas not designated for OSV use where designated trails intersect with northern goshawk protected PACs.
- Areas under 5,000 feet in elevation
 - ♦ Alternatives 3 and 5 analyze for not designating OSV use below 5,000 feet in elevation.

Alternative Components Not Considered in Detail

Alternatives not considered in detail in the FEIS may include, but are not limited to, those that fail to meet the purpose and need, are technologically infeasible or illegal, or would result in unreasonable environmental harm.

The suggested alternatives components eliminated from detailed study, and the rationales for eliminating these components, are summarized below.

Consider a special user-fee pass/permit system “Fee- Demo” that is specific to an area, Forest, or Ranger District. Fees would be collected from both motorized and non-motorized users to support on-the-ground services.

Imposing user fees at additional winter recreation areas would not address the purpose and need for action, and this action is outside the scope of this analysis.

Consider an appropriate ‘all pay’ use fee program in which all motorized and non-motorized users would pay. Collect fees on all recreational uses that use the ‘green sticker’ fee-funded plowed roads, trailheads, facilities and parking areas.

The ‘green sticker’ program is a California State program (California Recreational Trails Program – Title 14, California Code of Regulations Chapter 11.7, Section 4860) related to Off-Road Vehicles, and does not apply to non-motorized use. The existing system is an all-pay user system. OHV grant funds (Green Sticker Fees”) consist of gas taxes and fees collected for registering OHVs. OHV grant funds must be used for projects that support OHV use and may be used by all users unless otherwise restricted. Implementing a fee program beyond the existing programs is outside the scope of this analysis, and does not meet the purpose and need.

Segregate motorized and non-motorized use groups by designating separate trailheads, separate trails and/or separate areas.

Motorized and non-motorized recreational experiences are important concerns to be considered for this analysis (see Significant Issues). However, the development of new facilities such as new trailheads, new trails, or new snowplay areas are outside the scope of this project. This analysis is focused on the designation of OSV use and grooming of OSV trails. For this reason, this suggestion has been dismissed from further detailed analysis. However, we agree that facility improvements or changes may be valuable and/or necessary in the future.

Include an alternative under which no areas or trails would be designated for recreational OSV use.

Failing to designate areas or trails for OSV use would not meet the purpose and need for the project, nor does it meet the requirement for the Forest Service to comply with Subpart C regulations and the terms and conditions of the Settlement Agreement.

Review non-Wilderness areas that could be designated for OSV use. Many Forest Plans used non-motorized classifications to protect areas from timber production or summer wheeled recreation rather than OSV use.

The 1988 Forest Plan does not restrict or prohibit OSV use based on non-motorized classifications (i.e., recreation opportunity spectrum classes, semi-primitive areas) in areas other than those that are restricted by law, regulation, or policy (Wild portion of the Middle Fork Feather Wild and Scenic River, Bucks Lake Wilderness, Challenge Experimental Forest and the Pacific Crest National Scenic Trail). Therefore, this alternative component is not relevant.

Minimize the implementation of new regulations; include an alternative that contains no new regulations other than those currently in place in late 2015.

Alternative 1, the no-action alternative, would satisfy this request. However, this alternative does not meet the purpose and need, nor does it meet the requirement for the Forest Service to comply with the regulations in Subpart C of the Travel Management Rule and the terms and conditions of the Settlement Agreement. Alternative 1 is included as a baseline for comparative purposes.

Do not designate OSV use in the Rock Lake Basin as shown in the proposed action with the following amendments: Restrict all non-motorized winter recreation enthusiasts from all groomed over the snow vehicle trails; Restrict all non-motorized winter recreation enthusiasts from utilizing all roads that are cleared of snow funded entirely by California State OHV Funds; Restrict all emergency motorized assistance for non-motorized winter recreation enthusiasts in areas where motorized over the snow vehicles are prohibited; and Prohibit all non-motorized winter recreation enthusiasts from utilizing all recreation staging areas develop and funded by California State OHV Funds.

Restricting or prohibiting non-motorized winter recreation use is not within the scope of this action.

Consider specific additional opportunities for motorized uses

As described above, alternative 4 emphasizes opportunities for winter motorized recreational use, and is included for detailed analysis in the FEIS. However, not all aspects of this suggested alternative are within the scope of the analysis, and those elements have been dismissed from further detailed analysis, as described below:

- Designate several OSV trails that are ungroomed but located within areas where cross-country OSV use would be allowed by the proposed action. Where trails would be unmarked, ungroomed, and located in areas where cross-country OSV use would be allowed, the agency sees no need to designate them in the applicable alternatives.
 - ♦ Areas designated for cross-country OSV use also contain unmarked, ungroomed, “trails” where snow falls on underlying roads and trails. These “trails” will not be specifically designated as OSV trails because they occur in an area designated for cross-country use. This means that OSV use can occur anywhere in that designated area on NFS lands and there is no need to designate “trails” within a designated area. Each alternative description includes the miles of unmarked, ungroomed “trails where snow falls on underlying roads and trails within proposed designated areas for cross-country OSV use.
- The Forest Service should implement a sound standard for OSVs.
 - ♦ The Forest Service has no regulatory jurisdiction over noise. These levels are set by state law. The OSV Program Monitoring Checklist for the California Department of Parks and Recreation, OHMVR Division, and Forest Service does not include ambient noise monitoring. Therefore, this feature will not be included. The FEIS, however, will examine effects on noise from the proposed action and alternatives to the proposed action, including the indirect effects of changes in noise levels on forest resources.
- Add narrow groomed trails (using equipment with 8 feet or narrower width) to allow for designating more OSV trails where a larger groomer cannot fit.
 - ♦ As part of the OSV trail grooming program, the Forest Service follows California State Parks Off-Highway Motor Vehicle (OHMVR) Division grooming standards, including state trail-width standards and existing equipment abilities. Standards state, “Trails should be groomed at a minimum of 10 feet wide, with wider trails when necessary due to traffic and other conditions. Where the terrain allows, main ingress and egress trails that connect to the trailhead should be groomed to 14 feet wide or greater to facilitate the added traffic.” Deviation of groomed trail width down to 8 feet wide is not feasible at this time, given the type and size of grooming equipment currently in use and will not be analyzed in this document.

- Review and update parking and staging facilities for OSV access. Expand both the Lakes Basin and the La Porte Staging Areas.
 - ♦ The purpose and need for action is to provide a manageable, designated OSV system of areas and trails that is consistent with and achieves the purposes of the Forest Service Travel Management Rule at 36 CFR part 212. The creation or addition of new parking areas and staging facilities at trailheads is beyond the scope of this project.
- Designate non-motorized companion trails along designated OSV trails or groom trails for non-motorized users to access Wilderness areas or non-designated areas to reduce user conflict.
 - ♦ The creation of non-motorized companion trails that do not currently exist along designated motorized routes and the designation/grooming of non-motorized only trails to Wilderness or non-motorized land classification would not address the purpose and need and are beyond the scope of this project.
- Designate OSV use in the Eureka Peak area
 - ♦ Eureka Peak is within Plumas Eureka State Park. The Forest Service does not have jurisdiction in the State Park.

Consider specific alternative components for non-motorized use

As described above, alternatives 3 and 5 have been developed to address this suggestion and are included for detailed analysis in the FEIS. However, not all aspects of the suggested alternatives 3 and 5 are within the scope of the analysis. These specific components have been dismissed from further detailed analysis, as described below.

- Designation of non-motorized trailheads to access non-motorized areas.
 - ♦ The designation of non-motorized trailheads is outside the scope of the purpose and need for action which is to provide a manageable, designated OSV system of areas and trails for public use within the Plumas National Forest, that is consistent with and achieves the purposes of the Forest Service Travel Management Rule at 36 CFR Part 212, subpart C. Therefore, this feature would not be included in alternative 3 to be analyzed in detail.
- Monitoring of ambient air quality and noise near trails, in trailheads, and in OSV areas with heavy over-snow vehicle traffic.
 - ♦ The monitoring of ambient air quality and noise is outside the scope of the purpose and need for action, which is to provide a manageable, designated OSV system of areas and trails for public use within the Plumas National Forest that is consistent with and achieves the purposes of the Forest Service Travel Management Rule at 36 CFR Part 212, subpart C. The Forest Service has no regulatory jurisdiction over air quality or noise. There are no standards that would allow the Forest Service to identify or enforce prohibitions against unacceptable noise or air quality levels. These levels are set by state law. The OSV Program Monitoring Checklist for the California Department of Parks and Recreation, OHMVR Division, and U.S. Forest Service does not include ambient air quality monitoring (California OSV Program EIR, Program Years 2010-2020, appendix C). Therefore, this feature will not be included in alternative 3 to be analyzed in detail. The FEIS examines effects on air quality and noise from the proposed action and alternatives to the proposed action, including the indirect effects of changes in air quality and noise levels on forest resources.

- Transition to cleaner and quieter OSVs through encouragement of best available technology (BAT) to reduce air and noise pollution.
 - ♦ The imposition of best available technology requirements is outside the scope of the purpose and need for action, which is to provide a manageable, designated OSV system of areas and trails for public use within the Plumas National Forest that is consistent with and achieves the purposes of the Forest Service Travel Management Rule at 36 CFR Part 212, subpart C. 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.
- Nordic trail grooming.
 - ♦ Grooming of trails for non-motorized use would not address the purpose and need for action which is to provide a manageable, designated OSV system of areas and trails for public use within the Plumas National Forest, that is consistent with and achieves the purposes of the Forest Service Travel Management Rule at 36 CFR Part 212, subpart C. The purpose and need for action calls for identifying those designated NFS OSV trails where grooming for OSV use could occur. Therefore, this feature would not be included in alternative 3 to be analyzed in detail.
- Granting of access rights to private lands.
 - ♦ Over-snow vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations is exempt from subpart C designations (36 CFR Part 261.14(e)). The granting or maintenance of such access is outside the scope of the purpose and need for action, which is to provide a designated system of areas and trails for motorized over-snow vehicle use within the Plumas National Forest that is consistent with and achieves the purposes of the Forest Service Travel Management Rule at 36 CFR Part 212, subpart C. Therefore, this feature will not be included in alternative 3 to be analyzed in detail. Under the scope of this project, the Forest Service would only designate trails and areas under subpart C of the Travel Management Rule that are available for public use. Therefore, designating routes specifically for access to private lands, and not for public use, would not fall within the scope of this analysis or subpart C of the Travel Management Rule.
- The Plumas National Forest should designate appropriate areas for snow play. Designation of snow play areas allows for concentration of use in areas that are appropriate for snow play and that have adequate parking. Such areas and their primary access routes should not be designated for OSV traffic for safety and other reasons.
 - ♦ The designation of snow play areas is outside the scope of the purpose and need for action, which is to provide a designated system of areas and trails for motorized over-snow vehicle use within the Plumas National Forest that is consistent with and achieves the purposes of the Forest Service Travel Management Rule at 36 CFR Part 212, subpart C. Therefore, this feature will not be included in alternative 3 to be analyzed in detail.

Analyze the effects of OSV use on sensitive wildlife species including the Sierra Nevada Red Fox, Wolverine, Fisher, great gray owl, and black-backed woodpecker.

Sierra Nevada red fox and wolverine are not known to occur in the Forest. Data indicate that great gray owl is an uncommon visitor to the Plumas and has not been detected during the last decade in the Forest despite nine years of intensive survey effort (2008-2016). Sierra Nevada red fox, wolverine, and great gray owl do not require effects analyses as they do not occur in the project area, or rarely visit the area. The Forest would reconsider OSV impacts on these species should they colonize the project area in the future.

Black-backed woodpeckers have been observed in the project area, and effects analysis of all alternatives will be conducted on this species. With respect to fisher, although potential project impacts are not analyzed in detail because the species does not occur in the project area, the EIS presents law, regulation, and direction related to fisher and a detailed analysis and mitigations addressing potential project impacts on a forest carnivore that currently occurs in the project area, and occupies similar habitat (American marten). Should fisher colonize the project area in the future, management direction in the EIS designed to mitigate threats to fisher will immediately be implemented (e.g., den site buffers) while analyzing project impacts on the species.

Close designated OSV trails within 0.25 mile of marten nesting/rearing sites and limit OSV use within marten suitable habitat

All proposed alternatives include provisions for the discovery of a carnivore den site in the area, which may result in temporary closure of the surrounding area to OSV if disturbance to carnivores is suspected or documented. Proposed mitigations also include posting educational materials, trail signage, and promoting user group awareness of prohibitions against harassment of wildlife. The Forest also will follow standards and guidelines for carnivore den sites (SNFPA ROD pg. 62, #89).

Close all Sierra Nevada mountain yellow-legged frog and Cascade frog habitat to OSV use on April 15 or earlier if there is not sufficient snow to buffer vegetative habitat.

Proposed alternatives attempt to avoid potential conflict between OSV and Sierra Nevada yellow-legged frog habitat by allowing OSV use to occur in designated areas and designated trails only when there is adequate snow depth to prevent damage to soils and vegetation. Cross-country OSV use would be allowed in designated areas when there is 12 inches of snow or ice on the landscape, and OSV use is not proposed for designation over open water.

The following tables summarize effects using resource indicators, measures, and effects by alternative. Significant issues presented in chapter 1 are summarized first followed by socio-economics, transportation, soils, and hydrology.

Table 9. Summary comparison of how the alternatives address the key issues

Resource Element	Resource Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified	Alternative 3	Alternative 4	Alternative 5
1a. Availability of Motorized Over-snow Recreation Opportunities – Designated cross-country areas	Acreage of designated public OSV cross-country use	1,147,825 acres currently open to public, cross-country OSV use. No minimum snow depth requirement	858,436 acres designated for public cross-country OSV use, a 25.2 percent decrease from existing conditions. 12 inch snow depth requirement	600,542 acres designated for public cross-country OSV use, a 47.7 percent decrease from existing conditions. 18 inch snow depth requirement	1,160,793 acres designated for public cross-country OSV use, 1.1 percent decrease from existing conditions. 12 inch snow depth requirement	651,877 acres designated for public cross-country OSV use, a 43.2 percent decrease from existing conditions. 24 inch snow depth requirement
1a. Availability of Motorized Over-snow Recreation Opportunities - Designated snow trails	Length of designated OSV trails (miles), percent change from current management	227 miles of designated OSV trails (groomed and ungroomed), no change	226 miles of designated OSV snow trails, subject to snow depth restrictions, 44 percent decrease from existing conditions Adequate snow to prevent resource damage, typically 6 inch snow depth requirement	220 miles of designated OSV snow trails, subject to snow depth restrictions. 3 percent decrease from existing conditions 18 inch snow depth requirement	577 miles of designated OSV snow trails, subject to snow depth restrictions. 154 percent increase from existing conditions OSV use on trails would be allowed when there is adequate snow depth to avoid damage to natural and cultural resources	210 miles of designated OSV snow trails, subject to snow depth restrictions. 7.5 percent decrease from existing conditions 12 inch snow depth requirement
1a. Availability of Motorized over-snow recreation Opportunities – Designated, groomed snow trails	Length of groomed OSV trails (miles), percent change from current management	203 miles, no change from current management 12 inch snow depth requirement for grooming	143 miles, 29.5 percent decrease from current management 12 inch snow depth requirement for grooming	220 miles, 8 percent increase from existing conditions 12 inch snow depth requirement for grooming	623 miles, 207 percent increase from existing conditions No minimum snow depth requirement for grooming	210 miles, 3.4 percent decrease from existing conditions 12-18 inch snow depth requirement for grooming

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Resource Element	Resource Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified	Alternative 3	Alternative 4	Alternative 5
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Distance to non-motorized opportunities	<p>Acreage and length of trails (miles) available for non-motorized opportunities within 5 miles of plowed trailheads</p> <p>Percent of acres available for quiet, non-motorized use that are considered high-quality non-motorized opportunities based on proximity to plowed trailheads (areas within 5 miles of plowed trailheads) and absence of motorized use</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>12,957 acres available for non-motorized recreation within 5 miles of plowed trailheads, no change from existing conditions</p> <p>22.8 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>34,700 acres available for non-motorized recreation within 5 miles of plowed trailheads, a 21,743 acre increase from existing conditions.</p> <p>10.5 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>71,146 acres available for non-motorized recreation within 5 miles of plowed trailheads, a 58,189 acre increase from existing conditions.</p> <p>11.9 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>12,957 acres available for non-motorized recreation within 5 miles of plowed trailheads, no change from existing conditions</p> <p>29.5 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>69,685 acres available for non-motorized recreation within 5 miles of plowed trailheads, an 56,728 acre increase from existing conditions</p> <p>12.6 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>

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1b. Availability of Non-motorized Over-snow Recreation Opportunities – Conflicts with other resource values	Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.)	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Volume II, Appendices D and E	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Appendices D and E	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Appendices D and E	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Appendices D and E	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Appendices D and E
1b. Availability of Non-motorized Over-snow Recreation Opportunities - Wilderness	Size of areas (acres) affected and duration of impact. Qualitative description for wilderness attributes.	<p>Opportunities for solitude maybe temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 4,646 acres currently open to OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>	<p>Opportunities for solitude maybe temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 1,940 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>	<p>Opportunities for solitude maybe temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 225 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>	<p>Opportunities for solitude maybe temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 4,646 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>	<p>Opportunities for solitude maybe temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 1,423 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>

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1b. Availability of Non-motorized Over-snow Recreation Opportunities – Roadless Characteristics	Size of area (acres) affected and duration of impact. Qualitative description for roadless characteristics	Approximately 64,604 IRA acres currently open to OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.	Approximately 7,164 IRA acres designated for OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.	Approximately 8,348 IRA acres designated for OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area	Approximately 64,613 IRA acres designated for OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area	No IRA acres designated for OSV use. Roadless characteristics such as air quality and primitive and semi-primitive and semi-primitive non-motorized classes of dispersed recreation would not be impacted by proposed OSV use designations

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1b. Availability of Non-motorized Over-snow Recreation Opportunities – Pacific Crest Trail	Number of crossings; area (acres) where OSV use is allowed within 500 feet of centerline of the PCT	<p>No designated OSV trails across the PCT.</p> <p>OSV use allowed within 500 feet of centerline of the PCT on 5,294 acres of the PCT</p>	<p>16 designated OSV trails across the PCT (10 on MVUM routes, 2 on County Roads which are on the MVUM as background data and 4 crossing zones up to 0.25 mile wide)</p> <p>Non-motorized zone adjacent to the PCT at Bucks Summit, the eastern side of the Middle Fork Wild and Scenic River, and from the general area of Onion Valley to McRae Ridge.</p> <p>OSV use designated within 500 feet of centerline of the PCT on 1,717 acres of the PCT</p>	<p>9 designated OSV trails across the PCT (8 on MVUM roads and 1 on a motorized trail)</p> <p>OSV use designated within 500 feet of centerline of the PCT on 1,186 acres of the PCT</p>	<p>31 designated OSV trails across the PCT (25 MVUM roads and 6 linear features that would be wider than a road)</p> <p>OSV use designated within 500 feet of centerline of the PCT on 5,294 acres of the PCT</p>	<p>16 designated OSV trails across the PCT (on MVUM roads or trails, the width of a road, approximately 14 feet)</p> <p>OSV use not designated within 500 feet of centerline of the PCT.</p>

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1b. Availability of Non-motorized Over-snow Recreation Opportunities – Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for Wild and Scenic Attributes	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Eligible Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for eligible Wild and Scenic Attributes	Approximately 43.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings	Approximately 13.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings	Approximately 5.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings	Approximately 43.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings	Approximately 7.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings
1c. Quality of Motorized and Non-motorized Recreation Experiences – High quality motorized opportunities	Percent of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV use assumption categories	189,545 acres high to moderate OSV use 16.5 percent of the designated acres are considered high-quality	26.2 percent of the designated acres are considered high-quality	246,815 acres high to moderate OSV use 41 percent of the designated acres are considered high-quality	682,877 acres high to moderate OSV use 58.8 percent of the designated acres are considered high-quality	246,816 acres high to moderate OSV use 37.9 percent of the designated acres are considered high-quality

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1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality non-motorized opportunities	Acreage not designated for public cross-country OSV use, percent change as compared to current management	56,925 acres, OSV use not allowed.	346,314 acres not designated for OSV use, a 508 percent increase	604,208 acres not designated for OSV use, a 961 percent increase	43,957 acres not designated for OSV use, a 22.8 percent decrease	552,873 acres not designated for OSV use, a 871.2 percent increase
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Solitude	Distance of groomed public OSV snow trails from non-motorized areas	A total of approximately 5 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary	A total of approximately 7 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary	A total of approximately 3.5 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary	A total of approximately 5 miles of groomed OSV trails plus approximately 3 miles of potential groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary	A total of approximately 3.5 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Noise	Acres and percent of designated acres that are anticipated to have high to moderate OSV-use levels and the associated potential for noise impacts	1,147,825 acres currently open to OSV use and potentially affected by noise; 189,545 acres (16.5 percent) of the acres open to OSV use are expected to have high to moderate use.	858,436 acres designated for OSV use and potentially affected by noise; 226,360 acres (26.2 percent) of the acres designated for OSV use are expected to have high to moderate use.	600,542 acres designated for OSV use and potentially affected by noise; 246,815 acres (41 percent) of the acres designated for OSV use are expected to have high to moderate use.	1,160,793 acres designated for OSV use and potentially affected by noise; 682,877 acres (58.8 percent) of the acres designated for OSV use are expected to have high to moderate use.	651,877 acres designated for OSV use and potentially affected by noise; 246,816 acres (37.9 percent) of the acres designated for OSV use are expected to have high to moderate use.

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1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Scenery	Qualitative/narrative description of potential visual impacts	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 106,252 acres	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Fewer acres designated for cross-country OSV use, and associated visual impacts than in existing conditions and Alt 4. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 84,350 acres	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Fewer acres designated for cross-country OSV use, and associated visual impacts than all other alternatives. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 47,172 acres	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Slightly more acres designated for cross-country OSV use, and associated visual impacts than in existing conditions. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 106,282 acres	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Fewer acres designated for cross-country OSV use, and associated visual impacts than in existing conditions, Alt 2, and Alt 4. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 49,349 acres
Resource Element	Resource Indicator/Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
2. Effects to Air Quality	Potential contribution of OSV emissions (%)	<1	<1	<1	<1	<1

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3a. Effects to Terrestrial Wildlife - Marten	Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals, habitat modification (i.e., altered movement due to OSV use), or snow compaction effects to foraging or denning individuals	Acres of suitable marten habitat impacted by OSV use	349,156	305,337	257,864	352,150	283,415
3a. Effects to Terrestrial Wildlife - Marten	Potential for loss of habitat connectivity	Acres of connectivity habitat with potential to be impacted by OSV use	98,931	77,892	61,470	99,187	62,210
3a. Effects to Terrestrial Wildlife – California spotted owl	Potential for disturbance to or displacement of individuals from noise and increased human presence, injury or mortality of individuals	Acres of suitable CSO habitat impacted by OSV use	558,271	109,792	77,765	138,297	83,861
3a. Effects to Terrestrial Wildlife – California spotted owl	Potential for disturbance to or displacement of individuals from OSV use and increased human presence, injury or mortality of individuals	Acres of CSO PAC impacted by OSV use	47,419	37,253	14,666	7,317	15,935
3a. Effects to Terrestrial Wildlife – Northern goshawk	Potential for disturbance to individuals from noise and increased human presence, or injury or mortality of individuals	Acres of suitable habitat impacted by OSV use	731,289	524,484	345,308	740,239	156,121
3a. Effects to Terrestrial Wildlife – Northern goshawk	Potential for disturbance to individuals from OSV use and increased human presence, or injury or mortality of individuals	Acres of goshawk PACs impacted by OSV use	6,887	5,203	2,314	6,983	2,474
3a. Effects to Terrestrial Wildlife – Bald eagle	Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals	Acres of Primary Use Areas overlapping designated OSV areas	7,461	493	2	10,457	115

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3a. Effects to Terrestrial Wildlife – Mule deer	Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals, or habitat modification (i.e., altered movement due to OSV use)	Acres of mule deer winter range affected by OSV use	117,433	208	656	117,652	1
3a. Effects to Terrestrial Wildlife – Gray wolf	Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals, or habitat modification (i.e., altered movement due to OSV use)	Acres of gray wolf range affected by OSV use	21,330	30,751	9,593	41,477	9,593
3a. Effects to Terrestrial Wildlife – Willow flycatcher, Western bumble bees, and bats	Potential for habitat degradation from OSV use and related activities		Minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to protect meadow, riparian, wetland, and moist bottomland habitats from measurable impacts to water quality or vegetation.	Minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to protect meadow, riparian, wetland, and moist bottomland habitats from measurable impacts to water quality or vegetation.	Minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to protect meadow, riparian, wetland, and moist bottomland habitats from measurable impacts to water quality or vegetation.	Minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to protect meadow, riparian, wetland, and moist bottomland habitats from measurable impacts to water quality or vegetation.	Minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to protect meadow, riparian, wetland, and moist bottomland habitats from measurable impacts to water quality or vegetation.

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3a. Effects to Aquatic Wildlife - California red-legged frog	Potentially Suitable Habitat (PSH)	PSH (aquatic and terrestrial acres) <i>within cross-country OSV-use areas</i>	191,210	103,651	29,108	194,204	26,460
Sierra Nevada yellow-legged frog	Potentially Suitable Habitat (PSH)	PSH (aquatic and terrestrial acres) within cross-country OSV-use areas	75,627	61,124	39,917	76,160	39,831
Foothill yellow-legged frog	Potentially Suitable Habitat (PSH)	PSH (aquatic and terrestrial acres) within cross-country OSV-use areas	90,222	59,052	32,308	91,355	32,816
Western pond turtle	Potentially Suitable Habitat (PSH)	PSH (aquatic and terrestrial acres) within cross-country OSV-use areas	196,751	76,167	1,399	200,173	0
3a. Effects to Aquatic Wildlife - California red-legged frog	Potentially Suitable Habitat (PSH)	PSH (aquatic and terrestrial acres) <i>in proximity to designated OSV routes</i>	556	617	530	1,320	530
Sierra Nevada yellow-legged frog	Potentially Suitable Habitat (PSH)	PSH (aquatic and terrestrial acres) in proximity to designated OSV routes	282	369	324	748	324
3a. Effects to Aquatic Wildlife (continued) - Foothill yellow-legged frog	Potentially Suitable Habitat (PSH)	PSH (aquatic and terrestrial acres) in proximity to designated OSV routes	228	301	263	705	263
Western pond turtle	Potentially Suitable Habitat (PSH)	PSH (aquatic and terrestrial acres) in proximity to designated OSV routes	83	81	80	500	80
3a. Effects to Aquatic Wildlife - Hardhead	Potentially Suitable Habitat (PSH)	PHS (stream miles) <i>within cross-country OSV-use areas</i>	80	12	0	81	0
3a. Effects to Aquatic Wildlife - Hardhead	Potentially Suitable Habitat (PSH)	PHS (stream miles) <i>in proximity to designated OSV routes</i>	0	0	0	0	0

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3a. Effects to Aquatic Wildlife - California red-legged frog	Potentially Suitable Habitat (PSH)	<i>OSV stream crossings within PSH</i>	59	60	57	94	57
Sierra Nevada yellow-legged frog	Potentially Suitable Habitat (PSH)	OSV stream crossings within PSH	15	126	115	237	115
Foothill yellow-legged frog	Potentially Suitable Habitat (PSH)	OSV stream crossings within PSH	87	113	107	209	107
Western pond turtle	Potentially Suitable Habitat (PSH)	OSV stream crossings within PSH	6	6	6	21	6
Hardhead	Potentially Suitable Habitat (PSH)	OSV stream crossings within PSH	0	0	0	0	0
3a. Effects to Aquatic Wildlife - California red-legged frog	Designated Critical Habitat (DCH)	DCH (aquatic and terrestrial acres) <i>within cross-country OSV-use areas</i>	5,414	0	0	6,238	0
Sierra Nevada yellow-legged frog	Designated Critical Habitat (DCH)	DCH (aquatic and terrestrial acres) within cross-country OSV-use areas	46,469	41,238	22,925	46,678	31,990
3a. Effects to Aquatic Wildlife - California red-legged frog	Designated Critical Habitat (DCH)	DCH (aquatic and terrestrial acres) <i>in proximity to designated OSV routes</i>	0	0	0	0	0
Sierra Nevada yellow-legged frog	Designated Critical Habitat (DCH)	DCH (aquatic and terrestrial acres) in proximity to designated OSV routes	528	540	415	724	416
3a. Effects to Aquatic Wildlife - California red-legged frog	Designated Critical Habitat (DCH)	<i>OSV stream crossings within DSH</i>	0	0	0	0	0
Sierra Nevada yellow-legged frog	Designated Critical Habitat (DCH)	OSV stream crossings within DSH	15	15	8	21	8
3a. Effects to Aquatic Wildlife - All	Critical Aquatic Refuges (CAR)	CAR (aquatic and terrestrial acres) <i>within cross-country OSV-use areas</i>	219,008	168,840	102,612	223,102	223,102

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All	Critical Aquatic Refuges (CAR)	CAR (aquatic and terrestrial acres) <i>in proximity to designated OSV routes</i>	928	1,054	765	2,023	765
All	Critical Aquatic Refuges (CAR)	<i>OSV stream crossings within CARs.</i>	155	118	127	228	127
Resource Element	Resource Indicator	Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
3b. Effects to Botanical Resources	Species presence	Acres of sensitive and watch list plant occurrences within designated OSV-use areas	16,407	11,431	7,697	16,251	8,712
3b. Effects to Botanical Resources	Species presence	Acres of sensitive and watch list plant occurrences within high-use areas	1,674	1,618	1,679	5,636	1,680
3b. Effects to Botanical Resources	Qualitative discussion of species' responses to proposed activities	Sensitive and watch list plants effects determination	Minor, indirect. No loss of viability and no trend toward ESA listing	Minor, indirect. No loss of viability and no trend toward ESA listing	Minor, indirect. No loss of viability and no trend toward ESA listing	Minor, indirect. No loss of viability and no trend toward ESA listing	Minor, indirect. No loss of viability and no trend toward ESA listing
3b. Effects to Botanical Resources	TES plant species presence	Acres of TES plant occurrences within designated OSV-use areas (<i>Packera layneae</i>)	74	0	0	74	0
3b. Effects to Botanical Resources	TES plant species presence	Acres of TES plant occurrences within high use areas	0	0	0	0	0
3b. Effects to Botanical Resources	Noxious/invasive weed presence	Acres of invasive plant infestation within designated OSV-use areas	3,421	864	485	3,574	511
3b. Effects to Botanical Resources	Noxious/invasive weed presence	Acres of invasive plant infestation within high-use areas	36	55	38	415	38

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3b. Effects to Botanical Resources	Noxious/invasive weed presence	Level of risk (high, moderate, low) for the project introducing or spreading invasive plants	Low	Low	Low	Low	Low
3b. Effects to Botanical Resources	Presence of designated botanical resource areas	Acres of botanical special interest areas within designated OSV-use areas	0	0	0	0	0
3b. Effects to Botanical Resources	Presence of designated botanical resource areas	Acres of botanical special interest areas within high-use OSV-use areas	0	0	0	0	0

Resource Element	Resource Indicator	Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Socioeconomics - Economic activity	Employment, income tax revenue	Effect on labor income related to recreation tourism (motorized and non-motorized)	No effect	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect
Socioeconomics - Quality of life	Recreation visitation	Number of recreation visits (motorized and non-motorized)	No effect	<u>Direct/Indirect Effect</u> Motorized Use - Negligible adverse Non-Motorized use – negligible beneficial	<u>Direct/Indirect Effect</u> Motorized Use -Minor adverse Non-Motorized use – Minor beneficial	<u>Direct/Indirect Effect</u> Motorized Use - Minor beneficial Non-Motorized use – No effect	<u>Direct/Indirect Effect</u> Motorized Use -Minor adverse Non-Motorized use – Minor beneficial

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Resource Element	Resource Indicator	Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Socioeconomics - Quality of life	Values, beliefs, and attitudes	Qualitative evaluation of public values, beliefs and attitudes	No effect	<p><u>Direct/ Indirect</u></p> <p>Motorized Use – negligible effect</p> <p>Non-motorized use – minor beneficial.</p> <p><u>Cumulative</u> – No effect.</p>	<p><u>Direct/ Indirect</u></p> <p>Minor adverse to Motorized Recreationist</p> <p>Moderate beneficial to non-motorized recreationist</p> <p><u>Cumulative</u> – No effect.</p>	<p><u>Direct/Indirect</u></p> <p>Moderate benefit to Motorized Recreationist</p> <p>Minor adverse effect to non-motorized recreationist</p> <p><u>Cumulative</u> – No effect.</p>	<p><u>Direct/ Indirect</u></p> <p>Minor adverse to Motorized Recreationist</p> <p>Moderate beneficial to non-motorized recreationist</p> <p><u>Cumulative</u> – No effect.</p>
Socioeconomics - Environmental Justice	Low-income and minority populations	Change in the distribution of risk to economic well-being and cultural resources	No effect	<p><u>Direct/ Indirect/ Cumulative</u> - No effect in the distribution of risk to low income and minority communities</p>	<p><u>Direct/ Indirect/ Cumulative</u> - No effect in the distribution of risk to low income and minority communities</p>	<p><u>Direct/ Indirect/ Cumulative</u> - No effect in the distribution of risk to low income and minority communities</p>	<p><u>Direct/ Indirect/ Cumulative</u> - No effect in the distribution of risk to low income and minority communities</p>

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Resource Element	Resource Indicator	Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Transportation - Safety	Public safety and traffic	Qualitative effects to motor vehicle operators and other uses of the trail system	The current Plumas National Forest maps and signs provide adequate information to maintain a reasonable level of public safety and avoid traffic conflicts	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the OSV use map would also improve understanding of allowed uses and prohibitions.	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the OSV use map would also improve understanding of allowed uses and prohibitions.	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the OSV use map would also improve understanding of allowed uses and prohibitions.	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the OSV use map would also improve understanding of allowed uses and prohibitions.
Transportation - Cost	Affordability	Qualitative effects to the total cost of maintaining the forest transportation system (FTS) that will open to motor vehicle use	Minor effects (minor additional costs) due to over-snow vehicle use of access roads to popular parking and staging areas.	Minor additional maintenance costs due to over-snow vehicle use of access roads to popular parking and staging areas.	Minor additional maintenance costs due to over-snow vehicle use of access roads to popular parking and staging areas.	Minor additional maintenance costs due to over-snow vehicle use of access roads to popular parking and staging areas.	Minor additional maintenance costs due to over-snow vehicle use of access roads to popular parking and staging areas.

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Resource Element	Resource Indicator	Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Transportation - Property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	<p>No current Forest Plan standards for cross-country over-snow vehicle travel. If cross-country OSV travel occurs with inadequate snow depth, there could be adverse effects on resources.</p> <p>The Plumas National Forest current management for snow trail grooming using OHMVR Division funds and equipment follows OHMVR snow depth standards. Minimum snow depth requirement of 12 inches for grooming and trail use would provide adequate protection of underlying roads and trails.</p>	<p>Minimum snow depth requirements; 12 inches of snow or ice for cross-country OSV travel, 6 inches of snow or ice for designated trail use and 12 to 18 inches of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.</p>	<p>Minimum snow depth requirements; 18 inches of snow or ice for OSV cross-country travel, 18 inches of snow for designated trail use and 12 inches or more of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.</p>	<p>Minimum snow depth requirement of 12 inches for cross-country OSV travel would protect resources.</p> <p>There would be no minimum snow depth requirement for OSV use on designated trails and for trail grooming. If OSV use occurs on designated trails or if trail grooming is done with inadequate snow depth, there could be adverse effects on underlying roads and trails</p>	<p>Minimum snow depth requirements; 24 inches of snow or ice for cross-country OSV travel, 12 inches of snow or ice for designated trail use and 12 inches or more of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.</p>

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Resource Element	Resource Indicator/Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Soil - Productivity and Stability	Public OSV use on sensitive soils including wet meadows, areas with potential low stability and areas with potential erosion hazards. Acres of cross-country travel open to OSV use on sensitive soils	There would be no change in acreage of area currently open to cross-country OSV travel on sensitive soils. Approximately 255,731 acres with mapped sensitive soil types are open to cross-country travel.	Approximately 144,660 acres of sensitive soils would be open to cross-country OSV travel within the forest. This is less sensitive soils open to OSV use than under the current management and under alternative 4, but it is greater than under alternatives 3 and 5.	Approximately 64,855 acres of sensitive soils would be open to cross-country OSV travel. Under this alternative, the least amount of sensitive soils would be open to OSV cross-country travel.	Approximately 255,914 acres of sensitive soils would be open to cross-country OSV travel. Under this alternative, there would be the most acreage of sensitive soils open to cross-country OSV travel, even greater than under alternative 1.	Approximately 65,723 acres of sensitive soils would be open to cross-country OSV travel. Under this alternative, the acreage open to cross-country OSV use on sensitive soils is less than under alternatives 1, 2 - modified, and 4.
Soil - Stability	Minimum snow depths on trails designated for public OSV use	There is no minimum snow depth required prior to any OSV travel over existing roads and trails or cross country. With no minimum snow depth, soil resource damage could occur where cross-country or trail OSV use occurs and snow levels are not sufficient to prevent contact with the soil or road. This could lead to increases in erosion where bare soil is exposed.	Minimum snow depth the amount of snow necessary to adequately prevent resource damage. This is generally 6 inches of snow or ice prior to any OSV travel over existing roads and trails. This minimum snow depth 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. Monitoring of this snow depth is recommended to further evaluate the potential effects to soils.	Minimum snow depth is 18 inches of snow prior to any OSV travel over existing roads and trails. This minimum snow depth has been observed to be sufficient to prevent contact of OSVs with the bare soil surface.	There is no minimum snow depth required prior to any OSV travel over existing roads and trails or cross country. With no minimum snow depth, soil resource damage could occur where cross-country or trail OSV use occurs and snow levels are not sufficient to prevent contact with the soil or road. This could lead to increases in erosion where bare soil is exposed.	Minimum snow depth is 12 inches of snow prior to any OSV travel over existing roads and trails. This minimum snow depth has been observed to be sufficient to prevent contact of OSVs with the bare soil surface.

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Resource Element	Resource Indicator/Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Soil - Productivity and Stability	Minimum snow depths in areas designated for public, cross-country OSV use	No minimum snow depth required prior to any OSV travel over existing roads and trails or cross country. With no minimum snow depth, soil resource damage could occur where cross-country or trail OSV use occurs and snow levels are not sufficient to prevent contact with the soil or road. This could lead to long-term decreases in soil productivity where snow depth is not adequate to protect the soil resource from compaction, rutting and/or displacement.	Minimum snow depth of 12 inches of snow for cross-country OSV travel would not change. Potential effects to the soil are unlikely to occur with at least 12 inches of snow covering the soil surface.	Minimum snow depth of 18 inches of snow for cross-country OSV travel would not change. Potential effects to the soil are unlikely to occur with at least 12 inches of snow covering the soil surface.	Minimum snow depth of 12 inches of snow for cross-country OSV travel would not change. Potential effects to the soil are unlikely to occur with at least 12 inches of snow covering the soil surface.	Minimum snow depth of 24 inches of snow for cross-country OSV travel would not change. Potential effects to the soil are unlikely to occur with at least 12 inches of snow covering the soil surface.
Soil - Productivity and Stability	Total area open to OSV use	Approximately 1,147,825 acres of the Forest are open to OSV use. Under the no-action alternative, more acreage is open to OSV use compared to all the other alternatives.	Approximately 858,436 acres of the Forest would be designated for OSV use. This is much less acreage designated for OSV use than under alternatives 1 and 4, but slightly more acres designated for OSV use than under alternatives 3 and 5.	Approximately 600,542 acres of the Forest would be designated for OSV use, which is the least amount of acres open to OSV compared to all the other alternatives.	Approximately 1,160,793 acres of the Forest would be designated for OSV use, which is the greatest number of acres designated for OSV use out of all of the action alternatives, but is slightly less than under alternative 1.	Approximately 651,877 acres of the Forest would be designated for OSV use, which is less than all the other alternatives except alternative 3, which has slightly fewer acres designated for OSV use.

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Resource Element	Resource Indicator/Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Hydrology	Designated use area for OSV use	1,147,825	858,436	600,542	1,160,793	651,877
Hydrology	Minimum Snow Depth for OSV Use on Designated Trails underlain by roads or trails	Not specified	6	18	None	12
Hydrology	Minimum Snow Depth for Cross-country OSV Use	Not specified	12	18	12	24
Hydrology	Number of snowmobiles per year using trails across forest	22,250	22,250	22,250	22,250	22,250
Hydrology	Consistency with Riparian Conservation Objectives 1, 2, 4, 5, and 6	Complies with RCOs 1,2,4,5,6	Complies with RCOs 1,2,4,5,6	Complies with RCOs 1,2,4,5,6	Complies with RCOs 1,2,4,5,6	Complies with RCOs 1,2,4,5,6

Chapter 3. Affected Environment and Environmental Consequences

Introduction

This chapter presents the relevant resource components of the existing environment-the baseline environment. It describes the resources of the area that would be affected by the alternatives. This chapter also discloses the environmental effects of implementing the alternatives. The environmental effects form the scientific and analytical basis for comparing the alternatives described in chapter 2.

The effects of the alternatives were aggregated rather than describing the site-specific effect at each road or trail, unless necessary for a particular sensitive resource or concern area. For instance, specialists' reports describe the overall effects of designating places people could ride OSVs instead of listing every route and predicting the effects at a particular site.

Past, Present, and Reasonably Foreseeable Actions

The interdisciplinary team considered the effects of past actions as part of the existing condition. The current conditions are the sum total of past actions. The Council on Environmental Quality recognizes "agencies can conduct an adequate cumulative effects analysis by focusing on current aggregate effects of past actions without delving into the historical details of individual past actions" (Council on Environmental Quality 2005). Innumerable actions over the last century and beyond have shaped the Plumas National Forest's current designated road system within the planning area. Attempting to isolate and catalog these individual actions and their effects would be nearly impossible. By looking at current conditions, the effects of past human actions and natural events, regardless of which event contributed to those effects are captured.

Courts have interpreted a "reasonably foreseeable future action" as one that has been proposed and is in the planning stages. To analyze the cumulative effects of present and reasonably foreseeable future actions, each resource specialist looked at the list of projects in Volume II of this FEIS, appendix G. They identified the ones expected to cause effects to their resource, at the same time and in the same place as effects from the proposed action or alternatives.

OSV-use Assumptions for Analysis

The following OSV-use assumptions were developed based on information in the State EIR and 2009 Trailhead Survey, and based on local knowledge and observations of resource specialists from the Plumas National Forest. The assumptions were mapped and used in this analysis to consider potential impacts from OSV designations and OSV trail grooming activities on recreation and areas designated as non-motorized under existing law or policy. These assumptions are based on topography, vegetation characteristics, and groomed OSV trail locations, which would remain the same in all alternatives.

The OSV-use assumptions include:

- Limited OSV use on steep slopes with heavy forest cover/high tree density (assume no use on slopes 35 percent or greater). In open terrain, with no trees, there is no slope-limiting factor for high-marking.
- Open areas with many shrubs, OSVs won't use without adequate snow depth.

- OSV-use patterns:
 - ♦ Primarily day use (generally 10:00 am to 3:00 pm; grooming occurs at night).
 - ♦ OSV use is at the highest on weekends and holidays.
 - ♦ Highest concentrations of OSV use occur along groomed trails (this is supported by research documented in State EIR).
 - ♦ Concentrated use at trailheads.
 - ♦ Higher use in open meadows (concentrated on meadows with groomed trail access) and flatter areas.
 - ♦ OSV “high marking” occurs primarily on slopes with open vegetation coverage, near groomed trails.
 - ♦ Lower elevations generally have less OSV use – snow occurs at lower elevations less frequently and does not persist for long periods of time (2 to 5 days). On the Plumas National Forest, this would be between 3,500 to 5,000 feet in elevation.
- 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).
- Groomed trails are suitable for OSVs other than snowmobiles (side-by-sides and quads on tracks, snowcats, etc.)
- Groomed trails provide a higher degree of educational messages including messages encouraging trail sharing to reduce potential use conflicts.

Areas Considered for OSV Use Designation

The Plumas National Forest Land and Resource Management Plan (Plumas LRMP, USDA Forest Service 1988), did not establish designated OSV-use areas. However, for this planning effort, the Plumas National Forest has delineated seven discrete areas considered for OSV-use designation, within the administrative boundaries of the Plumas National Forest. Each area considered for OSV use is smaller than a Ranger District, consistent with 36 CFR 212.1.

The areas considered for OSV-use designation are described below, and have been reviewed for consistency with the Travel Management Rule’s designation criteria (36 CFR 212.55). The documentation of that review is captured in Appendices B and C. Each alternative proposes designating varying portions of these seven areas for public cross-country OSV use. These areas are primarily bounded by ridge tops, roads, or other geographic features that allow each area to be readily distinguished. They are also defined by their proximity to access points and other types of winter recreation. OSV-use areas are depicted on Figures 1-5, appendix A, Volume II of this FEIS.

Antelope Area

The proposed Antelope designated OSV area includes 135,290 acres in the northeastern portion of the Plumas National Forest. The elevation within the area ranges from 3,600 to 7,820 feet. It is adjacent to the communities of Greenville, Crescent Mills, Taylorsville, Genesee, Janesville, and Canyon Dam, and encompasses the three remote seasonal communities of Wilcox Valley, Franks Valley, and Antelope Village, which do not have winter road access. There is one groomed trail in this area that is managed by the Lassen National Forest in their Fredonyer OSV snow-trail system. There are three proposed

designated OSV trails not available for grooming in the Plumas National Forest within this area. The area contains two semi-primitive areas, Keddie Ridge and Thompson Peak, and two portions of one Research Natural Area (RNA), Mud Lake RNA and the Wheeler Peak Unit of the Mud Lake RNA. The area contains all classes of the Recreation Opportunity Spectrum (ROS) except Primitive. The predominant ROS class is Roaded Modified, and includes the Antelope Lake Recreation Area. This area receives moderate motorized and non-motorized use near populated areas, and low use by both groups in more remote areas. The location of this area is north and east of Indian Valley, north of Genesee Valley, west of Indian Creek between Genesee Valley and the Antelope Lake dam, north of National Forest System road 28N03 from the Antelope Lake Dam to its intersection with NFS Road 28N01, west of NFS Road 28N01 from its intersection with NFS road 28N03 to its intersection with the National Forest Boundary on Janesville Grade, south of the Plumas National Forest boundary from Janesville Grade to its intersection with California State Highway 89 (CA 89), and north of CA 89 between Canyon Dam, California, and Greenville, California.

Bucks Area

The proposed Bucks designated OSV area includes 243,964 acres located in the western portion of the Plumas National Forest between the North Fork and Middle Fork of the Feather River and west of the communities of Quincy, California, and Cromberg, California. The elevation within the area ranges from 3,500 to 7,183 feet. It is adjacent to the communities of Quincy, East Quincy, Cromberg, Greenhorn Ranch, Spring Garden, Meadow Valley, Twain, Paxton, Bucks Lake, and Berry Creek. This area contains high value areas for motorized and non-motorized over-snow recreation. There is one designated OSV trail system in the area, comprised of 14 designated OSV trails available for grooming, totaling approximately 113 miles, and 4 designated OSV trails not available for grooming, and totaling 11 miles. There are two official staging areas associated with this trail system: Bucks Summit (5,520 feet) and Big Creek (4,100 feet). The staging area at Bucks Summit is large and heavily used. The Big Creek staging area is used when there is adequate snow. There are no additional OSV designated OSV trails proposed for designation in the Plumas National Forest within this area. The area contains the Bucks Lake Wilderness Area, the Mount Pleasant Research Natural Area (within the Bucks Lake Wilderness Area), portions of the Middle Fork Feather River Wild and Scenic River and associated Semi-primitive and Roadless areas. Two reaches of creek that are eligible for wild designation under the Wild and Scenic Rivers Act on The Little North Fork MFFR, and Bear Creek are within this area. Three Special Interest Areas: Butterfly Valley (botanical), Little Volcano (geological), and Feather Falls (scenic) are within the area. The area contains all classes of the ROS. The predominant ROS class is Roaded Modified, and it contains the only Primitive area in the Plumas National Forest. This area receives high use by both motorized and non-motorized over-snow recreation groups.

Canyon Area

The proposed Canyon designated OSV area includes 91,740 acres in the northwestern part of the Plumas National Forest. It is generally north of the North Fork Feather River, west of Indian Creek between the Greenville Wye and Indian Valley, west of Indian Valley, south of CA 89 between Greenville and the Lake Almanor Dam, and south of the Lassen National Forest. It ranges in elevation between 3,500 and 6,483 feet. It is adjacent to the communities of Belden, Caribou, Seneca, Twain, Paxton, Indian Falls, Crescent Mills, Greenville, and Canyon Dam. There are no designated OSV trails within this area. The area contains the Chips Creek roadless area, the Pacific Crest National Scenic Trail (within the Chips Creek Roadless Area), two reaches of creek eligible for wild designation under the Wild and Scenic Rivers Act, and the Red Hill Special Interest Area. All classes of the ROS except Primitive are present, and the predominant class is Roaded Modified. It does not contain any recreation areas, but there are several

recreation sites in the area. The area receives a moderate amount of both motorized and non-motorized over-snow recreation.

Davis Area

The proposed Davis designated OSV area includes 181,118 acres in the central portion of the Plumas National Forest. It is generally north and east of CA 89 from Indian Valley to Mohawk Valley, east of Sierra Valley, and south of Red Clover Valley, Genesee Valley, and Indian Valley. The area ranges in elevation from 3,500 to 8,360 feet. This area contains high-value areas for motorized and non-motorized over-snow recreation. It is adjacent to the communities of Quincy, East Quincy, Cromberg, Mohawk, Blairsden, Graeagle, Clio, Delleker, Portola, Beckwourth, Genesee, Taylorsville, Crescent Mills, Indian Falls, and Keddie. There are currently no designated OSV trails groomed for OSV use in this area. The proposed action includes 15 designated OSV trails not available for grooming. The area contains the Grizzly Peak Roadless and Semi-primitive area, the Soda Rock geological Special Interest Area (also high Tribal significance), and the Brady's Camp proposed botanical Special Interest Area. All classes of the ROS except Primitive are present, and the predominant class is Roaded Modified. This area generally receives moderate levels of motorized and non-motorized use, with motorized over-snow use highest in the Lake Davis area.

Frenchman Area

The proposed Frenchman designated OSV area includes 278,044 acres in the eastern portion of the Plumas National Forest. It is north of Sierra Valley, northeast of Red Clover Valley, east of Genesee Valley and Antelope Lake Road (NFS Road 29N43), South of the Janesville Grade, and west of the communities of Milford and Doyle. It ranges in elevation between 4,000 and 8,327 feet. It is adjacent to the communities of Janesville, Milford, Doyle, Chilcoot, Vinton, Beckwourth, Portola, and Genesee, and includes the remote seasonal communities of Dixie Valley, Frenchman Village, and Antelope Village. The area receives a limited amount of both motorized and non-motorized over-snow recreation. There are no designated OSV trails available for grooming within this area, and the proposed action does not designate any additional trails for OSV use in the area. The area contains the Adams Peak Roadless Area, the Little Last Chance Canyon scenic Special Interest Area, the Eastern Escarpment and Dixie Mountain proposed botanical Special Interest Areas, and one reach of creek eligible for "wild" designation under the Wild and Scenic Rivers Act. All classes of the ROS except Primitive and Semi-primitive area represented within the area, and the predominant ROS class is Roaded Modified. This area receives low to moderate use by motorized and non-motorized over-snow recreationists. Motorized use is highest near Frenchman Lake.

Lakes Basin Area

The proposed Lakes Basin designated OSV-use area includes 46,897 acres in the southern central part of the Plumas National Forest. It is south and west of the Middle Fork Feather River, east of Nelson Creek, and north of the boundary with the Tahoe National Forest. The area ranges in elevation between 3,800 and 7,812 feet. This area contains high-value areas for motorized and non-motorized over-snow recreation. It is adjacent to the communities of Graeagle, Blairsden, Clio, Calpine, Johnsville, and Cromberg. There are four designated OSV trails available for grooming within this area. In addition, there are 3 designated OSV trails not available for grooming. The designated snow trail system in this area connects with designated OSV trails proposed in the neighboring Tahoe National Forest. The area contains the Pacific Crest National Scenic Trail, the Lakes Basin Semi-primitive area, Lakes Basin Recreation Area, a portion of the McRae Meadow proposed botanical special interest area, and one reach of creek eligible for wild designation under the Wild and Scenic Rivers Act on Little Jamison Creek. The area also encompasses Plumas Eureka State Park, which does not permit OSV use within its boundaries and is a popular year-round non-motorized recreation area. All classes of the ROS except Primitive are present, and the

predominant class is Roaded Modified. The area receives high use by both motorized and non-motorized over-snow recreationists.

La Porte Area

The proposed La Porte designated OSV-use area includes 183,742 acres in the southwest part of the Plumas National Forest. The area is south of the Middle Fork Feather River, west of Eureka Ridge from the Nelson Creek and MFFR confluence to A-tree Saddle, north of Canyon Creek which is the boundary with the Tahoe National Forest, and east of the communities of Strawberry Valley, Challenge, and Feather Falls. The area ranges in elevation between 3,500 and 7,715 feet. This area contains high-value areas for motorized and non-motorized over-snow recreation. It is adjacent to the communities of La Porte, Strawberry Valley, Challenge, Brownsville, and Feather Falls, and encompasses a seasonal recreation community at Little Grass Valley Reservoir. There are 7 designated OSV trails available for grooming within this area. In addition, there are 2 designated OSV trails not available for grooming. The area contains the Middle Fork Feather River, Bald Rock, and Beartrap/West Yuba Designated Roadless Areas, the McRae Meadow proposed botanical, Mount Fillmore proposed botanical, Fowler Lake proposed botanical, Valley Creek botanical, and Feather Falls scenic Special Interest Areas, and the Pacific Crest National Scenic Trail. The area contains 4 reaches of creek eligible for wild designation under the Wild and Scenic Rivers Act on The South Branch Feather River, Onion Valley Creek, McCarthy Creek, and Dixon Creek. The area is also adjacent to the designated wild zone of the Middle Fork Feather Wild and Scenic River. All classes of the ROS except Primitive are present, and the predominant class is Roaded Modified. This area generally receives high use by motorized recreationists and moderate use by non-motorized recreationists.

Designated Trails

Each alternative proposes specific National Forest System roads and trails to be designated as OSV trails figures 1-5 and tables 1-16, appendix A, Volume II of this FEIS for public OSV use. Designated OSV trails have been reviewed for consistency with the Travel Management Rule's designation criteria (36 CFR 212.55). The documentation for this review is captured in appendices B and C. OSV trail segments and mileages vary by alternative. Refer to the alternative descriptions below for a complete list of roads and trails proposed for OSV trail designation.

Two types of OSV trails are discussed in this document.

- **Designated OSV Trails Available for Grooming**

The grooming season generally begins in December or January and continues through March. Start and stop times vary per trail location and are dependent upon the presence and depth of snow. Trails are prioritized for grooming based on visitor use. Grooming has historically occurred several times per week on priority trails and after major storms. Grooming of OSV trails is funded by the State of California and is conducted in partnerships with volunteers.

Trails would be groomed for public OSV use to a minimum width of 10 feet and typically up to 14 feet wide. Designated OSV 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 a 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. OSV trails would not be groomed beyond the width of the underlying roadbed, where one exists. Where the terrain allows, main ingress and egress OSV trails that connect to the trailhead would be groomed to 18 feet wide or greater to facilitate the added traffic.

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. The California OHMVR Division's snow grooming 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.

- **Designated OSV Trails Not Available for Grooming**

These trails would be designated for OSV use and would not be available for grooming.

Vehicle Class

An OSV is defined as a motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis, while in use over snow (36 CFR 212.1). This broad definition includes a wide range of vehicles, from snow bikes to highway-legal vehicles equipped with tracks. Subpart C of the Forest Service's Travel Management Regulation at 36 CFR Part 212 allows for designation by class of vehicle. To provide a safe and enjoyable recreation experience, as well as to protect resources, there are two different OSV classes that will be discussed in the action alternatives:

- Class 1: over-snow vehicles that exert a ground pressure of 1.5 pounds per square inch (psi) or less.
- Class 2: over-snow vehicles that exert a ground pressure of 1.5 pounds per square inch (psi) or greater.

Recreation

Methodology

This analysis used ArcMap and relevant Geographic Information System (GIS) data layers covering the Plumas National Forest, including recreation opportunity spectrum (ROS) classes, Wilderness areas, Inventoried Roadless Areas, national trails, Wild and Scenic Rivers, Research Natural Areas, etc. The GIS layer of proposed OSV designations and groomed trails was used as an overlay with the recreation settings and opportunities, scenery, access and designated area layers listed above to determine any potential conflicts.

Forest plan direction was considered to ensure compliance with management direction. A review of existing law, regulation and policy relevant to recreation settings and opportunities, access, scenery, and designated area resources within the project area was completed and referenced where appropriate.

The requirements of the Travel Management Rule, Subpart C, including the general criteria for designation of roads, trails and areas (36 CFR 212.55(a)) was considered.

The Forest Service evaluated seven discrete areas for OSV-use designation, within the administrative boundaries of the Plumas National Forest. Each area considered for OSV-use designation was reviewed for consistency with the Travel Management Rule's designation criteria (36 CFR 212.55) (appendix B, Volume II of this FEIS). The OSV trails proposed for designation were also reviewed for consistency with the same criteria (Appendices D and E, Volume II of this FEIS).

The National Visitor Use Monitoring (NVUM) results, California State Parks, California Outdoor Recreation Plan, National Recreation Survey and the Environment information and online visitor information sources provided by the Forest Service and other local organizations and industry was used as an overview of the recreation opportunities, visitor use, and trends within the analysis area.

The NVUM visitor use information from 2005, 2010, and 2015 was considered. The best available site-specific visitor use information for Plumas National Forest OSV use was from the 2009 OSV Winter Trailhead Survey conducted in support of the 2010 State OSV Program EIR for Program Years 2010–2020. OSV registration information for the State of California and for counties within the Plumas National Forest was also used to depict OSV-use trends.

A case study and literature review of current information regarding motorized and non-motorized winter recreation trends and preferences; and coordination with local Forest Service Specialists regarding on-the-ground conditions and use patterns were used to summarize existing conditions and potential impacts.

To evaluate potential impacts to recreation settings and opportunities, access, scenery, and designated area resources, each alternative will be compared using issues, indicators and measures defined below.

Topics and Issues Addressed in This Analysis

Significant Issues

Issue 1a. Availability of Motorized Over-snow Recreation Opportunities

Designating areas and trails for OSV use has the potential to change recreation settings and opportunities by enhancing opportunities for motorized winter uses in some areas and limiting those opportunities in other areas:

- a) Eliminating popular, highly desirable areas that have been historically available for public, cross-country OSV-use
- b) Designating an insufficient quantity (miles and acres) of NFS trails and areas for public OSV use.
- c) Providing an insufficient quantity (miles) of groomed public OSV opportunities.

Issue 1b. Availability of Non-motorized Winter Recreation Opportunities

Public OSV use and grooming for public OSV use have the potential to impact the overall quality of the experience of recreationists seeking solitude and a more quiet, non-motorized recreation experience by:

- a) Reducing the quantity of NFS land available for quiet, non-motorized recreation;
- b) Allowing OSV use within areas that currently emphasize non-motorized recreation including Semi-Primitive Areas and Proposed or Recommended Wild and Scenic Rivers and Special Interest Areas;
- c) Increasing the area of overlap between non-motorized (e.g. snowshoeing, cross-country skiing, general snow play) and motorized (i.e., OSV) use;
- d) Increasing the distance of travel required in order to access desirable quiet, non-motorized recreation areas (perhaps to distances further than an enthusiast is physically able to travel);

Issue 1c. Quality of Winter Recreational Experiences

- a) Consuming untracked powder desired by non-motorized winter recreationists, particularly backcountry downhill skiers;

- b) Compacting, tracking, and rutting the snow, making the snow surface difficult and potentially unsafe for non-motorized users to cross-country ski, sled, snowshoe, or walk on;
- c) Creating a real or perceived risk of injury or mortality;
- d) Creating noise which may affect solitude and quiet recreational opportunities; and
- e) Impacting the scenery by reducing the amount of unaltered views.

Measurement indicators for determining effects to motorized and non-motorized recreation settings, recreation opportunities, and quality experiences are described in table 10, table 11, and table 12.

Table 10. Resource indicators and measures for assessing effects to recreation resources - motorized recreation

Issue Topic	Cause and Effect	Measure	Source
1a. Availability of Motorized Over-snow Recreation Opportunities	<p>Designating areas and trails for OSV use has the potential to change recreation settings and opportunities by enhancing opportunities for motorized winter users in some areas and limiting those opportunities in other areas:</p> <p>a) Eliminating popular, highly desirable areas that have been historically available for public, cross-country OSV-use;</p> <p>b) Designating an insufficient quantity (miles and acres) of NFS trails and areas for public OSV use; and</p> <p>c) Providing an insufficient quantity (miles) of groomed public OSV opportunities.</p>	<p>Acreage of designated public OSV cross-country use; percent change as compared to current management</p> <p>Length of designated OSV trails (miles), percent change from current management</p> <p>Length of groomed OSV trails (miles), percent change from current management</p>	Travel Management Rule (36 CFR 212), subpart C (applies to three measures)

Table 11. Resource indicators and measures for assessing effects to recreation resources – Non-motorized recreation and designated areas

Issue Topic	Cause and Effect	Measure	Source
1b. Availability of Non-motorized Winter Recreation Opportunities	Public OSV use and grooming for public OSV use have the potential to impact the overall quality of the experience of users seeking solitude and a more quiet, non-motorized recreation experience:	Acreage and length of trails (miles) available for non-motorized recreation enthusiasts within 5 miles of plowed trailheads	Public comments
	a) Reducing the quantity of NFS land available for quiet, non-motorized recreation;	Percent acres available for quiet, non-motorized use that are considered high-quality non-motorized opportunities based on proximity to plowed trailheads (areas within 5 miles of plowed trailheads) and absence of motorized use	
	b) Allowing OSV use within areas that currently emphasize non-motorized recreation including Semi-Primitive Areas and Proposed or Recommended Wild and Scenic Rivers and Special Interest Areas;	Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.).	Minimization Criteria: 36 CFR 212.55(b)(3)
	c) Increasing the area of overlap between non-motorized (e.g., snowshoeing, cross-country skiing, general snow play) and motorized (i.e., OSV) use; and	Size of areas (acres) affected and duration of impact. Qualitative description for wilderness attributes	FSH 1909.12 (72.1)
	d) Increasing the distance of travel required in order to access desirable quiet, non-motorized recreation areas (perhaps to distances further than an enthusiast is physically able to travel).	Size of area (acres) affected and duration of impact. Qualitative description for roadless characteristics	(P.L. 90-543, as amended through P.L. 111-11)
		Number of crossings; area (acres) where OSV use is allowed within 500 feet of centerline of the PCT	Comprehensive Management Plan for the PCT
		Size of areas (acres) affected and duration of impact. Qualitative description for Wild and Scenic attributes	Wild and Scenic Rivers Act
		Size of areas (acres) affected and duration of impact. Qualitative description for eligible Wild and Scenic attributes	The Plumas National Forest LRMP contains direction specific to management of eligible W&S Rivers and streams.

Table 12. Resource indicators and measures for assessing effects to recreation resources – quality of winter recreational experiences

Issue Topic	Cause and Effect	Measure	Source
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences	a) Consuming untracked powder desired by non-motorized winter recreationists, particularly backcountry downhill skiers;	Percent of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV-use assumption categories	OSV-use assumptions for analysis
	b) Compacting, tracking, and rutting the snow, making the snow surface difficult and potentially unsafe for non-motorized users to cross-country ski, sled, snowshoe, or walk on; c) Creating a real or perceived risk of injury or mortality; d) Creating noise which may affect solitude and quiet recreational opportunities; and e) Impacting the scenery by reducing the amount of unaltered views.	Acreage not designated for public cross-country OSV use; percent change as compared to current management Distance of groomed public OSV trails from non-motorized areas Acres and percent of designated acres that are anticipated to have high to moderate OSV-use levels and the associated potential for noise impacts Qualitative/narrative description of potential visual impacts	Minimization Criteria 36 CFR 212.55(b)(3): Consider effects on the following with the objective of minimizing: 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 Wilderness Act of 1964 Wild and Scenic Rivers Act of 1968 National Trails System Act of 1968 Pacific Crest National Scenic Trail Comprehensive Plan Values or features that often characterize Inventoried Roadless Areas (66 FR 3245, January 12, 2001) Minimization Criteria 36 CFR 212.55(b)(5) Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors LRMP Management Area Standards and Guidelines Specific Visual Quality Objectives standards and guidelines pertain to each management area. Visual quality objectives (VQO) include: Preservation (P), Retention (R), Partial Retention (PR), Modification (M), and Maximum Modification (MM)

Resource Indicators and Measures

The resource indicators and measures shown in table 10, table 11, and table 12 will be used to measure and disclose effects to recreation resources related to OSV-use designations and grooming trails for OSV use.

Spatial and Temporal Context for Effects Analysis

Spatial Context:

The spatial boundaries for analyzing the direct, indirect, and cumulative effects to recreation are within the Plumas National Forest boundary, because the proposed OSV designation decision would apply to OSV trails and areas within the forest boundary and have the potential to cumulatively impact OSV recreation experiences and opportunities across the forest.

Effects Timeframe:

The temporal boundaries for analyzing the direct and indirect effects to recreation are, in the short term, one year, and in the long term up to 20 years. Short-term effects such as changes in the acres available to motorized or non-motorized winter uses would occur upon implementation of the OSV designation decision. Long term effects such as decreases in use conflicts and protection of resources due to effective management of OSV use through a designated OSV system of trails and areas would occur over the life of the decision.

The temporal boundaries for analyzing cumulative effects to recreation are up to 20 years, because the OSV designations would remain in effect over the long term, and would therefore overlap in time with other forest management activities with potential to cumulatively impact OSV recreation experiences and opportunities.

Affected Environment

Existing Condition

Visitor use

To determine the potential effects of management alternatives, it is important to understand the characteristics of people who visit and recreate in the Plumas National Forest. Responding to the need for improved information about visitors to National Forest System lands, the Forest Service developed a nationwide, systematic monitoring process for estimating annual recreation use: the National Visitor Use Monitoring (NVUM) program.

The NVUM program was designed to provide statistically reliable estimations of recreation visitation to national forests and grasslands. Through collection and dissemination of information about recreational enthusiasts and their preferred activities, resource managers can make informed, strategic decisions about the types and amount of recreation opportunities provided in the national forest.

NVUM surveys were conducted in the Plumas National Forest during fiscal years 2005, 2010, and 2015 (USDA Forest Service 2005, 2010, 2015). Surveys collected information about participation in recreation activities, visitor demographics, and spending patterns. Summaries from these surveys are useful to describe recreation use patterns in the national forest. As displayed, these data are only valid at the forest level and cannot be disaggregated to specific sites or locations.

The Plumas National Forest serves a largely local client base. About 53 percent of visits came from people living within 50 miles of the national forest; another 17.9 percent came from people living 51 to 75 miles away. Most visits are short, day use lasting 6 hours or less. About 62 percent are people who visit at most five times per year.

In 2015, the three most reported main activities were developed camping (16.6 percent), fishing (13.7 percent), and viewing natural features (13.1 percent). Winter activities were reported as main activities for snowmobiling (0 percent), downhill skiing (0 percent), and cross-country skiing (0 percent). In 2010, the three most reported main activities were fishing (26.9 percent), viewing natural features (14.3 percent), and hiking (13.2 percent). Winter activities were reported as main activities for snowmobiling (0.1 percent), downhill skiing (0.1 percent), and cross-country skiing (0 percent). In 2005, the three most reported main activities were fishing (26.5 percent), relaxing (13.4 percent), and motorized water activities (13.1 percent). Winter activities were higher during this survey year than reported in more recent years, with snowmobiling (6 percent), cross-country skiing (1.2 percent), and downhill skiing (0 percent).

Table 13 displays the estimated visitor use based on the percentage of visitors reporting participation in snowmobiling and cross-country skiing.

Table 13. National visitor use management winter activities

Year	Activity	Total Annual National Forest Visits	% Participation	Estimated Annual National Forests Visits based on the % main Activity	Average hours participating in main activity
2015	Snowmobiling	357,000	0%	Minimal use	0
2015	Cross-countryskiing	357,000	0%	Minimal use	0
2010	Snowmobiling	526,000	0.2%	1,052	2
2010	Cross-countryskiing	526,000	0.6%	3,156	2
2005	Snowmobiling	414,000	6.6%	27,324	4
2005	Cross-countryskiing	414,000	1.3%	5,382	2.4

*A National forest visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A national forest visit can be composed of multiple site visits. The visit ends when the person leaves the national forest to spend the night somewhere else.

The California Department of Motor Vehicles records OSV registration by county each year. The Plumas National Forest falls within the seven counties shown in table 14.

Table 14. California OSV registration for counties in Plumas National Forest, 2009 through 2018

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Butte	1,093	1,054	1,057	991	1,014	955	1,101	1,126	1,025	1,146
Lassen	394	364	352	322	315	279	333	327	285	307
Plumas	1,236	1,180	1,111	1,025	1,022	920	1,027	1,053	930	981
Sierra	223	220	205	208	207	192	214	212	194	195
Yuba	340	351	325	300	310	303	224	181	147	167
TOTAL	3,286	3,169	3,050	2,846	2,868	2,649	2,899	2,899	2,581	2,796

*Data from CA State Parks, not official DMV records

Table 15 shows total statewide OSV registrations and out-of-state registrations.

Table 15. California statewide OSV registration, 2009 through 2018

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Subtotal	18,542	17,982	17,776	16,956	16,929	16,189	18,200	18,663	16,679	18,232
Out of State	260	242	235	244	215	197	224	181	147	167
Total	18,802	18,224	18,011	17,200	17,144	16,386	18,424	18,844	16,826	18,399

*Data from CA State Parks, not official DMV records

Snowmobile registrations in the Plumas National Forest counties and statewide have remained nearly stable, or declined slightly over the past ten years. The State EIR estimated that OSV use would continue to increase at a rate of approximately 4 percent per year, as it had between 1997 and 2009 (California Department of Park and Recreation 2010); however, that has not been the case in recent years.

OSV visitor use varies based on the amount of snowfall and the length of the season.

Table 16 is derived from the OSV trailhead survey conducted for the State EIR, and based on data summarized in the State EIR (California Department of Park and Recreation 2010). The table shows the average number of vehicles at trailheads, and the average number of OSVs that would be expected on weekends and holidays versus weekdays. Based on this information, estimated use per winter season is 22,250 OSV recreationists forest wide.

Table 16. Plumas National Forest OSV visitor use

Location	Day description	Number of vehicles	Number of OSVs*
Forestwide	Weekend or holiday (approx. 33 per season)	280	560
Forestwide	Weekday (approx. 65 per season)	29	58
Use information by trailhead:			
La Porte	Weekend or holiday	50	100
La Porte	Weekday	5	10
Bucks Summit	Weekend or holiday	110	220
Bucks Summit	Weekday	15	30
Big Creek	Weekend or holiday	40	80
Big Creek	Weekday	5	10
Gold Lake	Weekend or holiday	80	160
Gold Lake	Weekday	4	8

Based on 2009 data from California State Draft EIR

*assumes an average of 2 OSVs per vehicle parked at a trailhead

Conflicts between Motorized and Non-motorized Winter Experiences

The 2015 NVUM report indicates that about 75 percent of visitors to the Plumas National Forest are very satisfied, and 18 percent are somewhat satisfied. The satisfaction survey questions did not directly address winter use, however, the NVUM Importance-Performance ratings for Undeveloped General Forest areas that could be relevant to winter recreation include conditions of the environment, parking availability,

parking lot condition, feeling of safety, scenery, and signage adequacy all were rated “keep up the good work” (USDA Forest Service 2015).

Both motorized and non-motorized winter recreation activities can be described in three general categories including trail touring, backcountry exploring, and alpine adventure (Snowlands 2015). Trail touring is typically focused on the use of groomed trail systems, where the quality of the groomed trail with moderate climbs and descents is often the most important factor for the recreation experience. Backcountry exploring is focused on cross-country travel away from the groomed trail system with emphasis on travelling and exploring. Alpine adventure is characterized by the challenge of riding or skiing through powder snow on steeper slopes. In alpine adventure, backcountry skiers seek the downhill experience, while snowmobilers enjoy the challenge of climbing up (Snowlands 2015).

Areas where potential conflict between motorized and non-motorized winter uses could occur in the Plumas National Forest are primarily those areas described as important for non-motorized winter opportunities in the Antelope, Bucks, Davis and Lakes Basin Areas.

Conflict between motorized and non-motorized winter uses arise due to differing desired recreation experiences, public safety concerns, noise, air quality, and access issues. Public comments received during the scoping period for this project describe conflicts related to (1) displacing visitors who prefer non-motorized recreation opportunities; (2) posing safety concerns for non-motorized enthusiasts due to the high speed of vehicles on shared trails; (3) creating noise and air quality impacts that lead to the displacement of non-motorized enthusiasts; (4) quickly consuming untracked powder snow, which reduces a desired backcountry skiing experience; (5) disrupting ski tracks, making the snow surface unsuitable for cross-country skiing; and (6) grooming trails which the State of California’s Over Snow Vehicle Program Draft EIR estimates triples the OSV use on trails to the detriment of non-motorized enthusiasts.

In public comments received during the scoping period for this project, motorized winter enthusiasts expressed concerns regarding additional limitations on use; however, they generally did not describe conflicts with non-motorized use. Snowmobile trails are typically available for multiple uses, and in some areas provide opportunities for non-motorized uses such as cross-country skiing, snowshoeing, and winter mountain biking. There are also those who use snowmobiles as a means to access backcountry areas to participate in non-motorized activities (American Council of Snowmobile Associations 2014).

Opportunities for quality recreation experiences depend on both the settings (physical, social, and managerial aspects), and on the desired experience of the visitor. Conflicts occur when one recreationist affects or degrades the experience of another. Many non-motorized recreationists experience conflict with motorized recreationists (Adams and McCool 2010). Conflict can result in displacement or the abandonment of the use of a particular trail or area, or a change in time of use (Adams and McCool 2010).

Quality non-motorized winter recreation opportunities are typically characterized by quiet activities such as cross-country skiing or snowshoeing in a natural environment that is not influenced by the sound, smell of exhaust, or sight of snowmobiles. Areas must be accessible from plowed trailheads, as non-motorized recreationists typically do not travel long distances. Most non-motorized over snow recreation takes place within three to five miles of trailheads (American Council of Snowmobile Associations 2014). Non-motorized visitors spend an average of 2.3 hours on the snow per visit (Rolloff et al. 2009).

Quality motorized winter recreation opportunities are typically characterized by groomed trail systems and open hills for high marking. For this analysis, OSV opportunities across the Plumas National Forest were mapped based on the OSV-use assumptions criteria (listed in the OSV-use Assumptions for Analysis

section above). The areas that fall within the high to moderate OSV-use areas are considered to provide high-quality OSV opportunities based on the proximity to groomed trails and plowed trailheads, open meadows with trail access, and slopes with open vegetation near groomed trails. Snowmobilers typically have a maximum 80-mile round-trip travel range (California Department of Parks and Recreation 2010). Approximately half of motorized visitors indicated that they would not snowmobile or would snowmobile less if the trails were not groomed (Rolloff et al. 2009). OSV visitors spend an average of 6 hours on the snow per visit. Motorized recreationists are also interested in travelling through and experiencing a natural environment.

Recreation Settings and Opportunities

The Plumas National Forest, located in the northern Sierra Nevada just south of the Cascade Range provides a variety of recreation opportunities. Outdoor enthusiasts are attracted year round to its many streams and lakes, beautiful deep canyons, rich mountain valleys, meadows, and lofty peaks. Dispersed recreation in the Plumas includes fishing, hunting, driving for pleasure, lake recreation, horseback riding, hiking, biking, cross-country skiing, and off-road vehicle use.

Beginning in the foothill country near Lake Oroville, the Plumas extends through heavily timbered slopes and into the rugged high country near U.S. Highway 395. State Highway 70 between Oroville and U.S. Highway 395 provides year round access, and State Highway 89 provides convenient connections through Tahoe.

Other public lands adjacent to the Plumas National Forest include the Lassen National Forest to the north, and the Tahoe National Forest to the south. The nearest population centers are Sacramento, California, to the southwest and Reno, Nevada, to the southeast.

Special Management Area Designations

Wilderness

The Bucks Lake Wilderness was established by the California Wilderness Act of 1984. The wilderness encompasses 21,000 acres, and is located near the northern end of the Sierra Nevada mountain range. Elevations in the Bucks Lake Wilderness range from 2,000 feet in the Feather River Canyon to 7,017 feet at Spanish Peak. The top of the escarpment which the Pacific Crest Trail (PCT) crosses unfolds a spectacular view of the forest to the east and north. An impressive view of Mt. Lassen is visible on clear days (USDA Forest Service 2018).

Designated Wilderness areas are closed to motorized OSV use by the Wilderness Act of 1964. There are groomed OSV trails in the Bucks Lake Trail System near the southern portion of the Wilderness area.

Inventoried Roadless Areas

Approximately 65,000 acres of Inventoried Roadless Areas (IRAs) are located within the Plumas National Forest. IRAs provide clean drinking water and function as biological strongholds for populations of threatened and endangered species. They provide large, relatively undisturbed landscapes that are important to biological diversity and the long-term survival of many at-risk species. IRAs provide opportunities for dispersed outdoor recreation, opportunities that diminish as open space and natural settings are developed elsewhere. They also serve as bulwarks against the spread of non-native invasive plant species and provide reference areas for study and research (USDA Forest Service 2009).

Roadless area characteristics, as defined in 36 CFR §294.11 – Roadless Area Conservation, Final Rule and evaluated here include the following:

- High-quality or undisturbed soil, water, and air
- Sources of public drinking water
- Diversity of plants and animal communities
- Habitat for threatened, endangered, proposed, candidate, and sensitive species, and for those species dependent on large, undisturbed areas of land
- Primitive, semi-primitive nonmotorized and semi-primitive motorized classes of dispersed recreation
- Reference landscapes
- Natural appearing landscapes with high scenic quality
- Traditional cultural properties and sacred sites
- Other locally identified unique characteristics

Wilderness attributes, as defined at FSH 1909.12 (72.1) and evaluated here include the following:

1. Natural – The extent to which long-term ecological processes are intact and operating
2. Undeveloped – The degree to which the impacts documented in natural integrity are apparent to most visitors
3. Outstanding opportunities for solitude or primitive unconfined recreation – Solitude is a personal, subjective value defined as the isolation from sights, sounds, and presence of others and from developments and evidence of humans. Primitive recreation is characterized by meeting nature on its own terms, without comfort and convenience of facilities.
4. Special features and values – Unique ecological, geographical, scenic, and historical features of an area
5. Manageability – The ability to manage an area for wilderness consideration and maintain wilderness attributes

Table 17 shows the crosswalk between the wilderness attributes identified in Forest Service Handbook 1909.12 and the 1964 Wilderness Act; and the roadless area characteristics defined in the 2001 Roadless Area Conservation Rule (36 CFR §294.11). This crosswalk information is helpful to describe, and understand the wilderness attributes that may be present within inventoried roadless areas that may be considered during future wilderness inventory processes.

There are no groomed OSV trails within the IRAs. Cross-country OSV use is currently allowed in a majority of the roadless acreage within Bald Rock, Bucks Lake, Middle Fork, Chips Creek, Grizzly Peak, Adams Peak, and West Yuba IRAs. The IRAs are mostly within the semi-primitive ROS class, with some small portions in the roaded modified ROS class. Small portions of the Middle Fork IRA, are within ½ to one mile of the groomed OSV trails, including portions of the Silvertip/Quincy Road Loop, Black Rock Loop, and the Little Grass Valley in areas anticipated to have high to moderate levels of OSV use.

Wild and Scenic Rivers

The Middle Fork of the Feather River and its immediate environment were established as a Wild and Scenic River by Congress in 1968. Other rivers that are eligible for designation under the Wild and Scenic Rivers Act within the OSV areas described above include the Little North Fork MFFR, Bear Creek, Yellow Creek, Squirrel Creek, Last Chance Creek, Little Jamison Creek, Dixon Creek, McCarthy Creek, Onion Valley Creek, and the South Fork Feather River. OSV use is prohibited within one-quarter mile of

designated wild segments of Wild and Scenic Rivers, in compliance with the Plumas LRMP Wild and Scenic River interim guidelines requiring that activities within 0.25 mile of each bank of an eligible reach of a river or stream would be managed consistent with the direction for Wild and Scenic Rivers until eligibility and river classification is determined.

Table 17. Wilderness attributes and roadless characteristics crosswalk

Wilderness Attributes	Roadless Area Characteristics
<p>Natural</p> <p>Ecological systems are substantially free from the effects of modern civilization and generally appear to have been affected primarily by forces of nature</p>	<p>High-quality or undisturbed soil, water, and air; Sources of public drinking water;</p> <p>Diversity of plant and animal communities;</p> <p>Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land;</p> <p>Reference landscapes</p>
<p>Undeveloped</p> <p>Degree to which the area is without permanent improvements or human habitation</p>	<p>Natural appearing landscapes with high scenic quality</p>
<p>Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation</p> <p>Solitude: opportunity to experience isolation from the sights, sounds, and presence of others from the developments and evidence of humans</p> <p>Primitive and unconfined recreation: opportunity to experience isolation from the evidence of humans, to feel a part of nature, to have a vastness of scale, and a degree of challenge and risk while using outdoor skills</p>	<p>Primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation</p>
<p>Special Features and Values</p> <p>Capability of the area to provide other values such as those with geologic, scientific, educational, scenic, historical, or cultural significance</p>	<p>Traditional cultural properties and sacred sites; and Other locally identified unique characteristics.</p>
<p>Manageability</p> <p>The ability of the Forest Service to manage an area to meet size criteria and the elements of Wilderness</p>	<p>No criteria</p>

Pacific Crest National Scenic Trail

Approximately 79 miles of the Pacific Crest National Scenic Trail (PCT) extends across the Plumas National Forest, crossing two major canyons. OSV use along the PCT is prohibited by the National Trails System Act, P.L. 90-543, Section 7(c). The PCT is managed for non-motorized uses.

The PCT was designated in 1968 as one of the first national scenic trails. The PCT (extending from Mexico to Canada) was established to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas which such trails may pass. Along with the Appalachian Trail, the PCT is acknowledged as one of the premier non-motorized trails in the nation (USDA Forest Service 2009).

The Pacific Crest National Scenic Trail Comprehensive Management Plan (1982) contains the following direction:

Viewing and understanding resource management are considered to be part of the normal character of the trail. The management of the various resources will give due consideration to the existence of the trail and trail users within the multiple use concept. Prescription for management of the visual resources associated with the trail will be part of agency planning processes.

The Comprehensive Management Plan reinforces that snowmobiling along the trail is prohibited and has the following direction for implementation of the Plan:

Winter Use: Winter use (cross-country skiing and snowshoeing) should be accommodated where practical and feasible. Each agency should follow its own procedures for marking and signing the trail for winter use purposes. As a guideline, all trail markers should be at eye level (approximately 40" above average maximum snow depth). Sanitation facilities and snow removal for parking may be necessary. Any improvement or alterations of the vegetation should not detract from the quality of the recreation opportunities for other trail activities such as hiking and horseback riding.

Snowmobiling along the trail is prohibited by the national Trail System Act, P.L. 90-543, Sec 7(c). Winter sports plans for areas through which the trail passes should consider this prohibition in determining areas appropriate for snowmobile use. Winter sports brochures should indicate designated snowmobile crossing of the Pacific Crest Trail where it is signed and marked for winter use. If cross-country skiing and/or snowshoeing are planned for the trail, any motorized use of adjacent land should be zoned to mitigate the noise of conflict.

Approximately 16 miles of the PCT in the Plumas National Forest pass through the Bucks Lake Wilderness Area and the Middle Fork Feather River Wild and Scenic River area that are currently closed to OSV use. Approximately 7 miles of the PCT pass through the Bucks OSV area and approximately 17 miles of the PCT pass through the LaPorte OSV area near the groomed trail system. Groomed OSV trails cross the PCT in six locations.

Recreation Opportunity Spectrum

The Forest Service uses the recreation opportunity spectrum (ROS) to inventory and describe the range of recreation opportunities available based on the following characteristics of an area: physical (characteristics of the land and facilities), social (interactions and contact with others), and managerial (services and controls provided). The recreational settings are described on a continuum ranging from Primitive to Urban. The ROS classes within the Plumas National Forest include Primitive (P), Semi-Primitive Non-Motorized (SPNM), Roaded Natural (RN), Roaded Modified (RM) and Rural (R). OSV

designations that remain consistent with the ROS classes will provide for a diversity of opportunities for both motorized and non-motorized winter activities and the associated desired experiences.

A majority of Plumas National Forest acres are in the Roaded Modified class. Designated Wilderness falls within the Primitive class.

Table 18. Plumas National Forest recreation opportunity spectrum classes

Recreation Opportunity Spectrum	ROS Class Acres	% of Total
Primitive	23,148	2%
Semi-Primitive Non-Motorized	91,723	8%
Roaded Natural	161,330	13%
Roaded Modified	894,983	74%
Rural	31,831	3%
Total	1,203,015	100%

Source: Final EIS Plumas National Forest Public Motorized Travel Management Table 5

Motorized Winter Recreation

For over 30 years, the Forest Service, Pacific Southwest Region, in cooperation with the California Department of Parks and Recreation (California State Parks) Off-highway Motor Vehicle Division has enhanced winter recreation, and more specifically, snowmobiling recreation by maintaining National Forest System trails (snow trails) by grooming snow for snowmobile use. Plowing of local access roads and trailhead parking lots, grooming trails for snowmobile use, and light maintenance of facilities (e.g., restroom cleaning, garbage collection) are the essential elements of the OSV Program that keep the national forests open for winter recreation use.

There are approximately 227 miles of National Forest System OSV trails in the Plumas National Forest, with approximately 203 miles of these available for grooming. The groomed OSV trail system that is included in the California Department of Parks and Recreation, OSV Program funded activities is described below (California State Parks 2010).

Bucks Lake Trail System

The Bucks Lake trail system is located west of Quincy on Bucks Lake Road. The trail system offers 100 miles of groomed trails ranging in elevation from 4,000 feet to 5,900 feet. The trails are accessed from two staging areas, Bucks Summit and Big Creek, which are located on the east side of Bucks Lake off State Route 70/89 providing trail access from Quincy. Bucks Summit has a parking lot and restrooms. Big Creek provides parking via road shoulder pullouts along Bucks Lake Road and Big Creek Road. The trail system has one warming hut. Trails are groomed by the Mt. Hough Ranger District of the Plumas National Forest and by volunteers. Both staging area access roads (six miles on Buck Lakes Road and one mile on Big Creek Road) are plowed by Plumas County Road Department.

La Porte Trail System

The La Porte trail system is located east of Oroville on La Porte Road. A staging area with a large warming hut and restrooms is accessed from La Porte Road. The La Porte trail system offers 72 miles of groomed loop trails with views of Little Grass Valley Reservoir and the Feather River Canyon. La Porte trail elevations range from 4,900 feet to 6,600 feet. Four trailside-warming huts with wood stoves are available in addition to the trailhead warming hut. Trails are groomed by the Feather River Ranger

District of the Plumas National Forest and by volunteers. One-half mile of plowed access on La Porte Road is provided by Plumas County Road Department.

Gold Lake Trail System

Gold Lake is located near the southern boundary of the Plumas National Forest near Graeagle on Gold Lake Highway off State Route 89. Trailhead parking is provided via a parking lot accessed from Gold Lake Highway. The groomed trail follows Gold Lake Highway south to Gold Lake and into Tahoe National Forest connecting to the Bassetts trail system. Gold Lake is located in Lakes Basin and offers 10 miles of groomed trail ranging in elevation from 5,400 feet to 7,200 feet. Gold Lake trails are predominately located in Sierra County and trail grooming is contracted through Sierra County Public Works using volunteer groomers. The Plumas National Forest Beckwourth Ranger District maintains trail routes with signage and provides law enforcement. The Gold Lake trailhead is located in Plumas County. Four miles of Gold Lake Highway from State Route 89 to the trailhead is plowed by Plumas County Road Department.

Table 19. Overview of State of California OSV grooming program activity in the Plumas National Forest

Project Location National Forest (NF) and County	Recreation Facility³	State of California OSV Program Funded Activity
Plumas NF, Mt. Hough and Feather River Ranger District	Bucks Lake, La Porte, and Gold Lake Trail Systems	Groom 182 miles of trail, plow 11.5 miles of road and 4 trailheads, signing along trails, maintenance of 5 trailside warming huts 3 trailhead restrooms and 1 warming hut.
Plumas County near Quincy (Bucks Lake and La Porte)		
Plumas and Sierra Counties near Graeagle (Gold Lake)		

Note: The areas considered for OSV designation in the Plumas National Forest are described in chapter 2.

Non-Motorized Winter Recreation

Non-motorized winter recreation in the Plumas National Forest within the OSV analysis areas is described below:

Antelope Area

Thompson Peak is a high value area for backcountry skiers seeking solitude, untracked snow, and high-quality skiing terrain. Additionally, this area provides the only easily accessible backcountry ski opportunity on the east side of the Plumas National Forest. The area surrounding Thompson Peak is managed for a semi-primitive experience (minimization worksheets). Other important non-motorized areas include Keddie Ridge Semi-Primitive Area, and the Genesee Valley Special Management Area. The Thompson Peak and Keddie Ridge semi-primitive areas are also IRAs under the 2001 Roadless Rule. They were considered as semi-primitive roadless areas in the LRMP under the RARE II and are described in the Plumas National Forest LRMP (page 4-88). The Genesee Valley area is described in the Genesee Valley Special Management Area portion of the Plumas County General Plan. All three areas emphasize management that provides a non-motorized recreation experience.

The communities of Greenville, Taylorsville, Genesee, North Arm Indian Valley, Janesville, Antelope Village, Franks Valley, and Wilcox Valley are all adjacent to the Antelope OSV area. OSV use is generally compatible with all of the communities listed except Genesee. Management objectives for Genesee Valley

³ The only seasonal restrictions occur with regard to wheeled motorized use and grooming – wheeled vehicle use on groomed trails is prohibited from December 26 until March 31.

(Genesee Valley Special Management Area, Plumas County General Plan) specify that off-road recreational use shall be limited to non-motorized vehicles, and that all trails shall be for non-motorized use only.

Bucks Area

The Bucks Lake Wilderness is a popular non-motorized recreation destination for backcountry skiers and snowboarders, cross-country skiers, and snowshoers. OSV use in areas adjacent to the wilderness that are of high value to non-motorized recreation has the greatest potential for use conflict. The adjacent Black Gulch area is outside of the wilderness area but is part of the area highly valued for non-motorized recreation including backcountry skiing and snowboarding. The Black Gulch area currently receives little to no OSV use. The area adjacent to the southern boundary of the wilderness between Bucks Lake and Bucks Summit is another area that is of high value for non-motorized use. This area receives occasional OSV use and is an area where incursions of OSVs into the Wilderness area have occurred. The Buck's Creek Loop trail (non-motorized, un-groomed) is a popular cross-country ski and snowshoe area located between Bucks Summit and Bucks Lake along Bucks Creek. This area receives infrequent OSV use. Skiers use the groomed snow trail to access Bucks Creek Loop non-motorized trail. Snow play (sledding) occurs on and adjacent to the groomed trail at Bucks Summit and adjacent to parking lot.

The Bucks area includes Bucks Lake Wilderness, a portion of the Pacific Crest National Scenic Trail, a portion of the Middle Fork Feather River (Wild section of WSR), Butterfly Valley Botanical Area, and the Little North Fork MFFR and Bear Creek Wild and Scenic Eligible reaches.

Other areas popular with cross-country skiers and snowshoers include Snake Lake road (PC435), Lee Summit (NFS 23N22), Slate Creek road (NFS 24N28), Schneider Creek road (NFS 23N16), and Silver Lake road (NFS 24N29X).

Canyon Area

Non-motorized use occurs year-round on the trails in the North Fork Feather River canyon. A popular non-motorized trail follows the shore of Lake Almanor.

A small piece of PCT (3.7 miles), adjacent to Bucks Lake Wilderness, two reaches of eligible Wild and Scenic River, the proposed wild Yellow Creek from Hwy 70 to Lassen National Forest and Squirrel Creek are within the Canyon area. Red Hill proposed botanical Special Interest Area, and Chips Creek IRA are located in this area.

Davis Area

The Grizzly Peak semi-primitive area is a high value area for backcountry skiing. The highest overlap between motorized and non-motorized recreation occurs in the Lake Davis area which is popular with both snowmobilers and cross-country skiers and snowshoers.

Frenchman Area

The Genesee Valley area is a popular year-round non-motorized recreation location that does receive high winter use; however, the area does not receive significant OSV use.

Adams Peak IRA, Last Chance Creek reach of Proposed Wild and Scenic wild zone. Little Last Chance Canyon scenic SIA, Dixie Mountain Proposed botanical SIA, and Eastern Escarpment Proposed botanical SIA are included in the Frenchman area. Adams Peak IRA receives little to no OSV use and is the only semi-primitive non-motorized area on the eastern escarpment (ROD for LRMP, p.11).

Lakes Basin Area

Plumas Eureka State Park is a main hub for non-motorized winter recreation that extends onto adjacent NFS lands to the west, south, and east of the park, including Eureka Ridge, McRae Meadow, Florentine Canyon, Mount Washington, Mount Elwell, and Smith Lake. Portions of the Lakes Basin Recreation area also receive high amounts of non-motorized use, including the cross-country ski trail along Graeagle Creek, the Frazier Creek area, Smith Lake, and portions of the groomed trail system.

This area also contains a portion of the PCT, Little Jamison Creek reaches eligible for wild designation under the Wild and Scenic Rivers Act, and the Lakes Basin semi-primitive area west of Gold Lake Hwy, also an IRA under the 2001 Roadless Rule. It was considered a semi primitive roadless area in the LRMP under the RARE II, and a portion of the McRae Meadow proposed botanical SIA.

La Porte Area

A historic backcountry ski route transits a portion of this area and formerly used a Forest Service cabin in Onion Valley as an overnight ski hut. At Lexington Hill there is a proposed cross-country ski trail. Significant snow-play (sledding) occurs in the vicinity of the La Porte Staging Area.

This area includes the Middle Fork Feather Wild and Scenic River and associated Roadless and Semi-primitive area, a portion of the Pacific Crest National Scenic Trail, four reaches of creek eligible for wild designation under the Wild and Scenic Rivers Act on Dixon Creek, McCarthy Creek, Onion Valley Creek, and the South Fork Feather River, Beartrap Roadless/Semi-primitive area, Dixon Creek Semi-Primitive area, McRae Meadow proposed botanical SIA, Fowler Peak proposed botanical SIA, Mount Fillmore proposed botanical SIA, Valley Creek SIA, Feather Falls SIA, and the area adjacent to the staging area used for non-motorized snow play (sledding).) The semi-primitive areas are also IRAs under the 2001 Roadless Rule. They were considered as semi primitive roadless area in the LRMP under the RARE II.

Environmental Consequences

Alternative 1 – No Action – Continue Current Management

Direct and Indirect Effects

Issue 1a. Availability of Motorized Over-snow Recreation Opportunities

- a) Eliminating popular, highly desirable areas that have been historically available for public, cross-country OSV-use**

In the no-action alternative, opportunities for winter motorized recreation both cross-country and on groomed and ungroomed trails would remain the same as described in the existing conditions. There would be no reduction of opportunities or change in location for winter motorized OSV use.

Alternative 1 would not designate any NFS lands as OSV-use areas in the Plumas National Forest. However, although NFS lands would not be designated for OSV use, cross-country OSV use of 1,147,825 acres of NFS lands in the Plumas National Forest would be permissible, akin to current management. However, most of the forest does not receive adequate snow, so this acreage has not been available for OSV use all of the time. Minimization criteria were not considered for the no action alternative, therefore effects across acreage would be greatest of all alternatives.

The 2005 Travel Management Rule, subpart C, would not be implemented, and no OSV-use map would be produced.

b) Designating an insufficient quantity (miles and acres) of NFS trails and areas for public OSV use.

There are 227 miles of groomed and ungroomed OSV trails that have been available and utilized in the Plumas National Forest. There are 1,147,825 acres of NFS lands that have been available to motorized OSVs. Of the acres that have been available to motorized OSV use, 189,545 acres were mapped in the high to moderate OSV-use category (based on OSV-use assumptions for analysis). Therefore, 16.5 percent of the available acres are considered high-quality OSV opportunities. These are the baseline miles and acres that were used to show a comparison between the proposed trail and area designations in the action alternatives in this analysis. These trails and areas would remain available under alternative 1. There would be no reduction of opportunities or change in the location for winter motorized OSV use.

c) Providing an insufficient quantity (miles) of groomed public OSV opportunities.

There are 203 miles of groomed OSV trails that have been available and utilized in the Plumas National Forest. Grooming would continue as described in the 2010 State Draft EIR (OHMVR Division 2010), based on availability of funding and adequate snowfall. There would be no reduction of opportunities or change in the quantity of groomed public OSV opportunities.

Issue 1b. Availability of Non-motorized Winter Recreation Opportunities

a) Reducing the quantity of NFS land available for quiet, non-motorized recreation;

Opportunities for winter non-motorized recreation would remain the same as described in the existing conditions. There are a total of 56,925 acres across the Plumas National Forest where OSV use would not be allowed under current management.

b) Allowing OSV use within areas that currently emphasize non-motorized recreation including Semi-Primitive Areas and Proposed or Recommended Wild and Scenic Rivers and Special Interest Areas;

OSV use would remain consistent with RX-8 Semi Primitive Area Prescription in the forest plan.

Wilderness

There are approximately 5 miles of groomed OSV trails adjacent to the southern boundary of the wilderness area, including portions of the Mill Creek Trail, the Four Trees/Bucks Summit trail, and the Cutoff/Lookout Rock trail. There are also approximately 1.2 miles of the ungroomed Bald Eagle Mountain trail along the southwestern boundary of the wilderness. There are 4,646 acres where OSV use is allowed within one-quarter mile, adjacent to the Bucks Lake Wilderness. Occasional incursions into the Wilderness from the OSV trail system and adjacent areas would likely continue to occur. Motorized use in designated wilderness is prohibited by the Wilderness Act, and such illegal use impacts the outstanding opportunities for solitude, one of the qualities for which wilderness areas are managed. Ongoing wilderness boundary signage and patrol would address this concern.

The presence of the OSV trails or areas and grooming in close proximity to wilderness may temporarily impact outstanding opportunities for solitude, during the winter, when there is adequate snow for OSVs to be present. When OSVs are present, they may be seen or heard from within the wilderness and may impact opportunities for solitude. The wilderness characteristics

of natural, undeveloped, special features and manageability are not expected to be impacted by adjacent OSV use.

IRAs and Wild and Scenic Rivers

Portions of the Middle Fork IRA that surrounds the Middle Fork Feather River Wild and Scenic River are adjacent to groomed and ungroomed OSV trails where moderate to high OSV use is expected (Ararat Loop, Cold Water loop, and Mt Ararat ungroomed trail in the Bucks Area, and Hogback Trail in the La Porte Area). It is anticipated that most OSV use would remain on the trail system and would not occur within the IRA (see OSV-use assumptions for analysis). OSV use is not allowed within the Wild segments of the Middle Fork Feather River Wild and Scenic River. OSV use is allowed in the Grizzly Peak, Chips Creek, Adams Peak, and West Yuba IRAs, however they are in areas expected to have low OSV use, and no OSV trails pass through the IRAs.

Approximately 64,604 IRA acres currently open to OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.

Pacific Crest National Scenic Trail

The Pacific Crest National Scenic Trail (PCT) would remain non-motorized, as it is currently managed; however, OSV use is allowed adjacent to the trail. Although no OSV trails would be designated under alternative 1, there are existing groomed OSV trails that cross the PCT in six locations; OSVs could cross the PCT in any of the areas currently open to OSV use, potentially impacting the quiet, non-motorized trail experience when hikers and cross-country skiers encounter OSVs crossing the trail. Conflict between motorized and non-motorized uses along the trail is most likely to occur in areas that are easily accessible to non-motorized enthusiasts, within 5 miles of plowed trailheads. There are 22.4 miles of the PCT that are located within 5 miles of plowed trailheads. Winter non-motorized use of the PCT, such as cross-country skiing or snowshoeing, is most likely to occur along these 22.4 miles, due to the availability of plowed access and the distance typically traveled per day by winter non-motorized visitors. OSV use adjacent to the trail has the potential to impact trail experience due to the sights and sounds of OSVs in close proximity to the trail. In the existing conditions, OSV use is allowed within 500 feet of centerline of the PCT on 5,294 acres. Motorized use adjacent to the PCT may be impacting the nature of the trail as a year-round non-motorized trail, the potential for conflicts with winter non-motorized users on the trail are higher along the 22.4 miles of the PCT that are within 5 miles of plowed trailheads.

c) Increasing the area of overlap between non-motorized (e.g. snowshoeing, cross-country skiing, general snow play) and motorized (OSV) use;

Motorized OSV use overlaps with areas that are also desirable and accessible to non-motorized enthusiasts (within 5 miles of plowed trailheads) on 106,252 acres. In these locations, potential conflicts are more likely to occur, as motorized OSVs consume untracked powder snow that is desired by backcountry skiers, create tracks across the snow surface making skiing difficult, and create safety concerns in areas where motorized and non-motorized use is occurring at shared trailheads and on shared trails.

Based on annual OSV visits to the Plumas National Forest and the acres available for motorized OSV use under existing conditions, there would be 5,414 acres per OSV. There are adequate acres for OSVs to disperse across the available areas.

- d) Increasing the distance of travel required in order to access desirable quiet, non-motorized recreation areas (perhaps to distances further than an enthusiast is physically able to travel);**

Displacement or conflict may occur where non-motorized enthusiasts are unable to access areas for desired quiet, non-motorized experiences away from the sights, sounds, and smells of motorized use, without traveling long distances through motorized routes and areas, or traveling further than they are physically able to traverse in a typical day. There are approximately 12,957 acres available for high-quality, quiet, non-motorized winter activities where OSV use is not currently allowed, and approximately 7.6 miles of cross-country ski trails and 22.4 miles of the PCT within 5 miles of plowed trailheads. Based on their proximity to plowed trailheads and absence of motorized use, 22.8 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities.

Issue 1c. Quality of Winter Recreational Experiences

- a) Consuming untracked powder desired by non-motorized winter recreationists, particularly backcountry downhill skiers;**
- b) Compacting, tracking, and rutting the snow, making the snow surface difficult and potentially unsafe for non-motorized users to cross-country ski, sled, snowshoe, or walk on;**
- c) Creating a real or perceived risk of injury or mortality;**

Current and potential areas of conflict between OSV uses and other existing or proposed recreational uses on NFS lands or neighboring Federal lands were identified in the minimization criteria worksheets within the following OSV areas (Volume II, Appendices D and E): Antelope, Bucks, Davis, and Lakes Basin areas. Existing areas of conflict between motorized and non-motorized winter uses would continue under alternative 1, as in the existing conditions.

Antelope: Potential conflicts between motorized uses and non-motorized uses exist in this area. Thompson Peak is a high value area for backcountry skiers seeking solitude, untracked snow, and high quality skiing terrain. Additionally, this area provides the only easily accessible backcountry ski opportunity on the east side of the Plumas National Forest. The area surrounding Thompson Peak is managed for a semi-primitive experience. OSV use of this area would be likely to have adverse effects to the solitude and quiet recreation opportunities sought by non-motorized recreationists. ,

Bucks: Potential conflicts between motorized and non-motorized uses exist in this area. The Bucks Lake Wilderness is a popular non-motorized recreation destination for backcountry skiers and snowboarders, cross country skiers, and snowshoers. OSV use in areas adjacent to the wilderness that are of high value to non-motorized recreation has the greatest potential for use conflict. The adjacent Black Gulch area is outside of the wilderness area but is part of the area highly valued for non-motorized recreation including backcountry skiing and snowboarding. The Black Gulch area currently receives little to no OSV use. The area adjacent to the southern boundary of the wilderness between Bucks Lake and Bucks Summit is another area that is of high

value for non-motorized use. This area receives occasional OSV use and is an area where incursions of OSVs into the Wilderness area have occurred. The Buck's Creek Loop trail (non-motorized, un-groomed) is a popular cross-country ski and snowshoe area located between Bucks Summit and Bucks Lake along Bucks Creek. This area receives infrequent OSV use. Skiers use the groomed snow trail to access Bucks Creek Loop non-motorized trail. Snow play (sledding) occurs on and adjacent to the groomed trail at Bucks Summit and adjacent to parking lot. ,

Davis: Potential conflicts between motorized and non-motorized uses exist in this area. Grizzly Peak semi-primitive area is a high value area for backcountry skiing. The highest overlap between motorized and non-motorized recreation occurs in the Lake Davis area which is popular with both snowmobilers and cross-country skiers and snowshoers.

Lakes Basin: There is potential for conflict between motorized and non-motorized recreationists in this area. Plumas Eureka State Park is a main hub for non-motorized winter recreation that extends onto adjacent NFS lands to the west, south, and east of the park, including Eureka Ridge, McRae Meadow, Florentine Canyon, Mount Washington, Mount Elwell, and Smith Lake. Portions of the Lakes Basin Recreation area also receive high amounts of non-motorized use, including the cross-country ski trail along Graeagle Creek, the Frazier Creek area, Smith Lake, and portions of the groomed trail system.

Within the above areas, potential conflicts include: 1) Safety- both real and perceived risks of collisions with high speed OSVs may adversely affects the non-motorized recreation experience; 2) Emissions- the smell and physiological effects of inhaled exhaust from OSVs may negatively affect the non-motorized recreation experience; 3) Noise- the noise produced by OSV use may negatively impact non-motorized users recreationists desire for solitude and quiet recreation; 4) Entitlement- designation of this area as open to for OSV use may result in a perception that motorized use is the preferred use; 5) Displacement- non-motorized recreationists may avoid using the area due to the potential for disturbance from motorized use; 6) Altercation- any of the above potential conflicts could result in physical altercations between recreationists. 7) Quality of snow- OSV use of an area may cause snow to become compacted, tracked, and rutted. This makes the snow surface difficult and potentially unsafe for non-motorized recreationists to cross-country ski, snowshoe, sled, or walk on. Given the range and speed of OSVs and the ephemeral nature of snow, OSVs can quickly impact large areas of high-quality, untracked snow valued by all over-snow recreationists.

d) Creating noise which may affect solitude and quiet recreational opportunities; and

Under alternative 1, 1,147,825 acres would remain available to OSV use and the associated influence of OSV noise, as under current management. Noise sources of multiple OSVs and vehicles would be concentrated at plowed OSV trailheads, and more dispersed across OSV areas and along OSV trails (see OSV-use assumptions for analysis). However, only 189,545 acres or approximately 16.5 percent of the 1,147,825 acres where OSV use is allowed, are anticipated to have high to moderate OSV-use levels and the associated potential noise impacts because they are in desirable, historically available OSV-use areas.

Existing conflicts between motorized and non-motorized winter experiences in the Plumas National Forest would continue and may increase as population and visitor use increase. Ongoing motorized use in close proximity to the areas designated for their non-motorized qualities, such as wilderness (there are approximately 4,646 acres currently open to OSV use within ¼ mile of designated Wilderness boundaries) and the PCT (OSV use allowed adjacent to approximately 60

miles of the PCT that do not pass through areas closed to motorized use), temporarily degrades opportunities for solitude near the non-motorized area boundaries, when OSVs are present. Similarly, there may be temporary impacts to air quality when OSVs are present.

e) Impacting the scenery by reducing the amount of unaltered views.

Short-term impacts to scenery occur when OSV tracks through the snow crisscross the landscape, leaving visual evidence of motorized use. The tracks only remain on the landscape until they are covered by additional snowfall or until the snow melts, and do not cause long-term impacts to scenery or the underlying soils and vegetation (see additional analysis in the Soils section beginning on page 336, and Botany section beginning on page 268, of this FEIS). Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 106,252 acres.

Table 20. Resource indicators and measures for the existing condition, alternative 1

Resource Element	Resource Indicator/Measure	Existing Conditions
1a. Availability of Motorized Over-snow Recreation Opportunities – Designated cross-country areas	Acreage of designated public OSV cross-country use; Percent change as compared to current management	1,147,825 acres currently open to public, cross-country OSV use, no change. No snow depth restrictions
1a. Availability of Motorized Over-snow Recreation Opportunities – Designated snow trails	Length of designated OSV trails (miles), Percent change from current management	227 miles of designated OSV trails (groomed and ungroomed), no change
1a. Availability of Motorized over-snow recreation Opportunities – Designated, groomed snow trails	Length of groomed OSV trails (miles), Percent change from current management	203 miles, no change from current management 12 inch snow depth requirement for grooming
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Distance to non-motorized opportunities	Acreage and length of trails (miles) available to non-motorized recreation enthusiasts within 5 miles of plowed trailheads Percent of acres available for quiet, non-motorized use that are considered high-quality non-motorized opportunities based on proximity to plowed trailheads (areas within 5 miles of plowed trailheads) and absence of motorized use	Four plowed trailheads provide access for motorized and non-motorized winter use 12,957 acres available for non-motorized recreation within 5 miles of plowed trailheads, no change from existing conditions 22.8 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities 7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Distance to non-motorized opportunities	Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.)	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Volume II, Appendices D and E
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Conflicts with other resource values	Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.)	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Volume II, Appendices D and E

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Resource Element	Resource Indicator/Measure	Existing Conditions
1b. Availability of Non-motorized Over-snow Recreation Opportunities -Wilderness	Size of areas (acres) affected and duration of impact. Qualitative description for wilderness attributes.	<p>Opportunities for solitude maybe temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 4,646 acres currently open to OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Roadless Characteristics	Size of area (acres) affected and duration of impact. Qualitative description for roadless characteristics	<p>Approximately 64,604 IRA acres currently open to OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation maybe temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Pacific Crest Trail	Number of crossings; area (acres) where OSV use is allowed within 500 feet of centerline of the PCT	<p>No designated OSV trails across the PCT.</p> <p>OSV use allowed within 500 feet of centerline of the PCT on 5,294 acres of the PCT</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for Wild and Scenic Attributes	<p>10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Eligible Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for eligible Wild and Scenic Attributes	<p>Approximately 43.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings</p>
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality motorized opportunities	Percent of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV-use assumption categories	<p>189,545 acres high to moderate OSV use, 16.5 percent of the available acres are considered high-quality.</p>
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality non-motorized opportunities	Acreage not designated for public cross-country OSV use, percent change as compared to current management	<p>56,925 acres, OSV use not allowed.</p>

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Resource Element	Resource Indicator/Measure	Existing Conditions
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Solitude	Distance of groomed public OSV snow trails from non-motorized areas	A total of approximately 5 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Noise	Acres and percent of designated acres that are anticipated to have high to moderate OSV-use levels and the associated potential for noise impacts	1,147,825 acres currently open to OSV use and potentially affected by noise; 189,545 acres (16.5 percent) of the acres open to OSV use are expected to have high to moderate use.
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Scenery	Qualitative/narrative description of potential visual impacts	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 106,252 acres

Cumulative Effects

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Past, present, and reasonably foreseeable projects in the area include (past) vegetation management (including commercial thinning, salvage cutting, improvement cutting, and hazard tree removal) in addition to (present) ongoing recreational use of the forest, snow trail grooming, road and parking area plowing, and routine administrative patrols. Three recreational projects that are in progress include the realignment of 800 feet of the Mud Lake Trail; Rehabilitation of the Four Corners OHV Play Area, and construction of 0.95 mile of the Mills Peak Trail South.

Issue 1a. Availability of Motorized Over-snow Recreation Opportunities

Cumulative impacts to the motorized recreation experience are expected to be minimal. Most forest activities would not take place during the winter when the landscape is covered with snow. Generally, NFS lands below the 3,500-foot elevation do not receive snowfall in adequate amounts to support OSV use.

Past vegetation management and fire salvage projects adjacent to groomed OSV trails and in areas designated for cross-country OSV use may enhance opportunities for cross-country OSV use by removing trees that would otherwise obstruct OSV riding. Vegetation treatment, in addition to OSV grooming could cumulatively enhance OSV opportunities.

Issue 1b. Availability of Non-motorized Winter Recreation Opportunities and Issue 1c. Quality of Winter Recreational Experiences

Disturbance from general motorized use and recreational access occurs and will continue to occur throughout the forest indefinitely. We anticipate minimal changes in the existing recreation profile. Other recreational activities that take place off the developed roads, such as the gathering of miscellaneous forest products and hunting, occur within the project area, but because OSV use would generally occur on adequate snowpack, we anticipate no cumulative effects from other ongoing recreational activities.

Noise from OSVs in areas and on trails across the forest would add to other (ongoing, present) sound sources, such as OSV grooming equipment (although overlap is not likely since grooming is done at night, while OSV recreation is during the day), road and parking area plowing equipment, vehicles on plowed portions of highways, airplanes, etc.

Cumulative noise across the forest could impact non-motorized enthusiasts who are seeking quiet, non-motorized experiences. Since OSV use under current management is allowed across the entire forest (except for areas with existing prohibitions (Bucks Lake Wilderness (21,000 acres), Challenge Experimental Forest (3,400 acres), the Pacific Crest Trail (79 miles), (approximately 170 acres), within Rx-11 Bald Eagle Habitat Prescription (Plumas LRMP EIS, USDA Forest Service, 1988, p. 3-24) (Plumas LRMP EIS, USDA Forest Service, 1988, p. 4-96). The wild zone of Wild and Scenic Rivers, alternative 1 would likely have the highest potential for cumulative noise impacts as compared to the action alternatives.

Direct and Indirect Effects Common to All Action Alternatives

Issue 1a: Availability of Motorized Over-Snow Recreation Opportunities

Having a clearly designated system of trails and OSV-use areas and the subsequent production of the OSV-use map would improve information available to the public about opportunities for OSV use. This

would assist both motorized and non-motorized recreationists in selecting areas that meet their setting and experience preferences, and therefore, would minimize the potential for conflict.

The OSV area designations increase the management presence across the forest, through additional signs, maps, and motorized route designations that visitors must understand and comply with, slightly impacting the managerial component of the forest setting.

According to the 2009 State DEIR trailhead survey, there are approximately 22,250 OSV visits to the Plumas National Forest per winter season, typically mid-December through March. OSV use would be spread across the available designated OSV acres and trails. Based on 22,250 visits, if use were spread evenly across each day of the season, there would be approximately 212 OSVs in the forest per day. Daily use may be higher during weekends and holidays and lower during the week.

Issue 1b: Availability of Non-Motorized Winter Recreation Opportunities and Issue 1c. Quality of Winter Recreational Experiences

The existing OSV prohibitions in the Bucks Lake Wilderness areas would continue, in compliance with the Wilderness Act.

In all alternatives, there are 10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with the Plumas LRMP Wild and Scenic River interim guidelines requiring that activities within 0.25 mile of each bank of an eligible reach of a river or stream would be managed consistent with the direction for Wild and Scenic Rivers until eligibility and river classification is determined, and in compliance with Rx-2 Wild and Scenic River prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.

The PCT would continue to be managed as a non-motorized trail, in compliance with the National Trails System Act and the PCT Comprehensive Plan.

Alternative 2 - Modified

Alternative 2 - modified is described in detail in chapter 2 of this FEIS.

Minimization Measures for Recreation Resources Common to All OSV Areas

Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands:

The Forest Service would provide accurate maps, signage and electronic information to educate the public on OSV-use restrictions. The Forest Service would provide signage and electronic information to educate the public on responsible practices and use restrictions for Class 2 OSVs.

The Forest Service would provide signage and electronic information to educate the public on responsible practices and trail restrictions to reduce conflicts. This may increase safety awareness of recreationists, reduce any sense of entitlement felt by a particular group, and reduce any expectation of non-motorized visitors regarding solitude or noise- and emission-free recreation on the trail.

The Forest Service would install proper signage on multi-use and non-motorized trails, and provide electronic information and paper maps that clearly display and explain trail restrictions.

The National Trail System Act, P.L. 90-543, Sec 7(c) prohibits the use of motorized vehicles by the general public along any national scenic trail. 36 CFR § 261.20 states: "It is prohibited to use a

motorized vehicle on the Pacific Crest National Scenic Trail without a special-use authorization.” The area surrounding the PCT in the Canyon Area is already closed to OSV use because it is within the Chips Creek Semi-Primitive Area, which would minimize noise disturbance to non-motorized recreationists on the PCT. OSVs would be allowed to cross the PCT on designated OSV crossings. There are no designated OSV trails across the PCT identified in the Canyon Area.

Areas within 0.25 mile of Wild and Scenic Eligible Wild zones on Yellow Creek and Indian Creek would not be designated for OSV use. This is consistent with Plumas LRMP Wild and Scenic River interim guidelines requiring that activities within 0.25 mile of each bank of an eligible reach of a river or stream would be managed consistent with the direction for Wild and Scenic Rivers until eligibility and river classification is determined.

Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors:

Areas within and surrounding Genesee Valley would not be designated for OSV use. This area is described in the Genesee Valley Special Management Area portion of the Plumas County General Plan. The direction for Genesee Valley emphasizes management that provides a non-motorized recreation experience. OSV use in this area would conflict with management objectives

The Forest Service would provide maps and electronic information that clearly identify areas designated and not designated for OSV use and the location of non-motorized areas including the Bucks Wilderness, the Pacific Crest National Scenic Trail and the Bucks Creek Loop trail.

Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring Federal lands:

Class 2 OSVs would be allowed to operate on designated groomed trails only. Class 2 OSVs would not be allowed to operate cross-country or on ungroomed trails.

Cross-country over-snow travel by wheeled vehicles is prohibited under current wheeled motorized vehicle use regulations. None of the alternatives would amend or rescind the existing prohibition on operating wheeled vehicles cross country.

Plumas National Forest, Plumas County, and Sierra County would cooperate to temporarily close designated, groomed trails to use by wheeled vehicles.

Minimization Measures for Recreation Resources by OSV Area

Antelope Area

Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands:

The Thompson Peak Semi-Primitive Area would not be designated for OSV use. Plumas LRMP Semi-primitive Area Prescription (Rx-8, page 4-88) and ROS class SPNM (page R-1).

The following areas would not be designated for public, cross-country OSV use: areas within Genesee Valley, Thompson Peak Semi-Primitive Area, and the portion of the Keddie Semi-Primitive Area adjacent to the Homer and Deerheart Lakes areas of the Lassen National Forest. Plumas LRMP Semi-primitive Area Prescription (Rx-8, page 4-88) and ROS class SPNM (page R-1).

Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring Federal lands:

Class 2 OSVs would be allowed to operate on designated groomed trails only. Class 2 OSVs would not be allowed to operate cross-country or on ungroomed trails.

Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.

The Plumas National Forest would coordinate with the Lassen National Forest to ensure that information produced for the Fredonyer Snow Trail System accurately communicates relevant information and OSV restrictions for recreationists crossing into the Plumas National Forest.

Bucks Area

Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands:

The Bucks Lake Wilderness Area would not be designated for OSV use. To facilitate enforcement and prevent motorized entry into the wilderness, the area north of Bucks Lake Road between the staging area and the east arm of Bucks Lake would not be designated for OSV use.

To accommodate current use patterns and reduce potential conflicts between motorized and non-motorized uses, the high value non-motorized recreation areas within the Black Gulch area between the eastern boundary of Bucks Lake Wilderness and Silver Lake Road, south of Silver Lake and north of Bucks Lake Road would not be designated for OSV use.

To comply with Forest Plan direction, the following areas would not be designated as open to for OSV use:

Bucks Lake Wilderness, the Wild zone of the Middle Fork Feather Wild and Scenic River, the Middle Fork Feather River Semi-primitive Area and Inventoried Roadless Area, and the Butterfly Valley botanical SIAs.

The National Trail System Act, P.L. 90-543, Sec 7(c) prohibits the use of motorized vehicles by the general public along any national scenic trail. 36 CFR § 261.20 states: “It is prohibited to use a motorized vehicle on the Pacific Crest National Scenic Trail without a special-use authorization.” An area not designated for OSV use is applied along the PCT at Bucks Summit, a congested, high-use staging area, to minimize noise disturbance to non-motorized recreationists on the PCT. NFS lands adjacent to Plumas County Road 414 near Deadwood Creek and adjacent to private lands were also included in the areas not designated for OSV use.

The Bucks Summit trailhead receives both non-motorized and motorized uses. The area not designated for OSV use provides a noise barrier along the PCT in a congested area. This segment of the PCT provides about 3 miles of gentle terrain to the south of Bucks Summit. OSVs would be allowed to cross the PCT on designated OSV crossings.

Areas within 0.25 mile of Wild and Scenic Eligible Wild zones on The Little North Fork NFFR and Bear Creek reaches would not be designated for OSV use. This is consistent with Plumas LRMP Wild and Scenic River interim guidelines requiring that activities within 0.25 mile of each

bank of an eligible reach of a river or stream would be managed consistent with the direction for Wild and Scenic Rivers until eligibility and river classification is determined.

Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring Federal lands:

Plumas National Forest and Plumas County would cooperate to temporarily close designated, groomed trails to use by wheeled vehicles.

The Forest Service would monitor use patterns and consider additional temporary seasonal road closures to enhance over snow recreation opportunities and minimize use conflicts.

Canyon Area

Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands:

The Chips Creek Semi-Primitive Area and Inventoried Roadless Area would not be designated for OSV use, Plumas LRMP Semi-primitive Area Prescription (Rx-8, page 4-88) and ROS class SPNM (page R-1).

The area between CA89 and the south end of Lake Almanor would not be designated for OSV use, because there is a non-motorized trail in this area and OSV use would cause adverse effects and safety concerns.

Consider compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors:

The Plumas National Forest has coordinated to propose designated OSV-use areas that align with adjacent designated OSV-use area boundaries in the Lassen National Forest.

Davis Area

Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands:

The Grizzly Peak Semi-primitive area would not be designated as open for OSV use. Plumas LRMP Semi-primitive Area Prescription (Rx-8, page 4-88) and ROS class SPNM (page R-1).

Mitigations described in the Terrestrial Wildlife section (p. 207 of this FEIS) should mitigate conflict between uses in the Lake Davis area. Signage would be installed along multi-use designated snow trails in the Davis Trails System to alert and educate recreationists to proper etiquette and safety concerns associated with non-motorized use on trails. Areas not designated for OSV use along the shore of Lake Davis (due to overlap with bald eagle territories) would prevent overlap between cross-country skiers and snowshoers and OSVs that could otherwise occur along the lake shore.

The Grizzly Peak Semi-Primitive Area and Inventoried Roadless Area and the Soda Rock SIA would not be designated for OSV use. Plumas LRMP Semi-primitive Area Prescription (Rx-8, page 4-88) and ROS class SPNM (page R-1); Plumas LRMP (1988) Forest-wide Standards and Guidelines:

Protect unique botanical values for research purposes, (4-59). Protect areas of unique scenic, botanic, or geological value (4-59).

Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring Federal lands:

If the snow trails are designated, the Plumas would consider whether to issue a seasonal, temporary Forest Order closing the designated OSV trails in the area to use by wheeled motor vehicles to avoid safety and conflicts.

The Plumas National Forest would monitor OSV use of Davis designated snow trail system. If OSV use increases, current staging locations may be insufficient for vehicle parking needs and may conflict with plowing of roads.

Frenchman Area

Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands:

The Adams Peak Inventoried Roadless Area would not be designated for OSV use. Plumas LRMP Semi-primitive Area Prescription (Rx-8, page 4-88) and ROS class SPNM (page R-1).

Lakes Basin Area

Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands:

To accommodate current use patterns and reduce potential conflicts between motorized and non-motorized uses, the high value non-motorized recreation areas adjacent to Plumas-Eureka State park would not be designated for OSV use. This includes areas west, south, and east of Plumas-Eureka State Park. This is consistent with Plumas LRMP direction for the Lakes Basin Semi-primitive Area (Rx8) and Management Area 35, Lakes Basin: “Allow motorized over-the-snow travel, but consider restricting to designated areas if conflicts develop with other users or resources” (page 4-324).

The Smith Lake Area receives high non-motorized use and low OSV use and would not be designated for OSV use. The cross-country ski trail along Graeagle Creek in Lakes Basin Recreation Area would remain non-motorized and not open designated to OSV use.

The upper (south) portion of Little Jamison Creek Basin would be designated for OSV use. The lower (north) portion of Little Jamison Creek Basin would not be designated for OSV use. This area overlaps a reach of river proposed as Wild under the Wild and Scenic River Act and receives little OSV use.

An area not designated for OSV use is applied along the PCT from the general area of Onion Valley to McRae Ridge to include the preservation of historic ski trails. OSVs would be allowed to cross the PCT on designated OSV crossings trails to facilitate OSV travel between designated open OSV-use areas in the Plumas and Tahoe National Forests.

Portions of the Lakes Basin semi-primitive area in Florentine Canyon, the north face of Mount Elwell, Smith Lake basin, and lower Little Jamison Creek basin (closest to Plumas Eureka State Park and highest non-motorized use) would not be designated for OSV use. This is consistent

with Plumas LRMP direction for the Lakes Basin Semi-primitive Area (Rx8) and Management Area 35, Lakes Basin: “Allow motorized over-the-snow travel, but consider restricting to designated areas if conflicts develop with other users or resources” (page 4-324).

Minimize conflicts among different classes of motor vehicle uses of NFS lands or neighboring Federal lands:

Plumas National Forest and Plumas County would cooperate to temporarily close designated, groomed trails to use by wheeled vehicles.

La Porte Area

Minimize conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands:

The Forest Service would clearly indicate the cross-country ski trail in the Lexington Hill area as not designated for OSV use on maps and electronic information.

The Forest Service would post signs warning/informing recreationists that snow play (sledding) occurs adjacent to the La Porte Staging Area. Informative signs would inform recreationists of etiquette and safe use practices.

A portion of the area surrounding the PCT in the La Porte Area is already closed to OSV use because it is within the West Yuba Semi-Primitive Area and within 0.25 mile of proposed wild reaches of eligible Wild and Scenic Creeks and rivers. OSV use would be designated within 500 feet of the PCT near groomed OSV trails and where motorized roads and trails cross or parallel the PCT, and motorized use is allowed adjacent to the trail in both the summer and winter.

The Middle Fork Semi-primitive and Inventoried Roadless Area would not be designated for OSV use. Plumas LRMP Semi-primitive Area Prescription (Rx-8, page 4-88) and ROS class SPNM (page R-1).

Portions of the Beartrap and Dixon Creek Semi-primitive and Inventoried Roadless Areas would not be designated for OSV use.

OSV use would be designated in a portion of these areas to facilitate connectivity of OSV use between the Lakes Basin and LaPorte designated OSV-use areas.

Botanical SIAs and the Feather Falls scenic SIA would not be designated for OSV use. Excluding OSV use from these areas would protect threatened, sensitive, and watch list botanical resources in this land allocations in accordance with the Plumas LRMP.

Plumas LRMP (1988) Forest-wide Standards and Guidelines:

- Protect unique botanical values for research purposes, (4-59).
- Protect areas of unique scenic, botanic, or geological value (4-59)

Direct and Indirect Effects - Alternative 2 - Modified

Issue 1a. Availability of Motorized Over-snow Recreation Opportunities

a) Eliminating popular, highly desirable areas that have been historically available for public, cross-country OSV use

The seven areas designated for cross-country OSV use under alternative 2 - modified include a total of 858,436 acres of NFS lands. Of the 858,436 acres designated for public cross-country OSV use, 144,332 acres are located in areas that have been identified as having potential for high to moderate OSV use. Based on the high to moderate OSV assumption categories, 16.8 percent of the designated acres are considered high-quality OSV opportunities. This is a lower percentage of high-quality designated acres than in alternatives 3, 4 and 5.

The forest-wide snow depth requirement of 12 inches for areas designated for OSV use would impose restrictions on OSV use, although it is likely that most OSV owners would not ride with less than adequate snow depths to prevent damage to their OSVs. Establishing the forest-wide minimum snow depth for cross-country OSV use would minimize impacts to soil, water, vegetation, and wildlife resources, as described in the relevant sections of this analysis. Designating public OSV use on snow trails when there is adequate snow depth to avoid damage to natural and cultural resources. To avoid damaging resources on designated OSV trails with underlying roads, a minimum of 6 inches of snow or ice is typically needed. This would provide improved trail access for OSV to reach areas of higher terrain with adequate snow depths.

b) Designating an insufficient quantity (miles and acres) of NFS trails and areas for public OSV use.

There are 289,389 acres of areas currently available for OSV use that would not be designated for OSV use in alternative 2 - modified, a 25.2 percent decrease from existing conditions, however OSV use is typically only available on areas above 3,500 feet when there is adequate snowfall for OSV use to occur. This is a greater reduction in acres than proposed in alternative 4, and less of a reduction compared to what is proposed in alternatives 3 and 5.

Alternative 2 - modified would slightly decrease the miles of designated OSV trails (226 miles), as compared to the existing conditions (227 miles). This would have a negligible effect for miles of trail available for OSV use. This is more miles of designated OSV trail than proposed in alternatives 3 (220 miles) and 5 (210 miles), but less than proposed in alternative 4 (577 miles).

This is a greater increase in miles than proposed in alternatives 3 (46 miles added) and 5 (27 mile reduction), but less than proposed in alternative 4 (523 mile increase).

Two classes of OSV have been identified in alternative 2 - modified, including class 1: over-snow vehicles that typically exert a ground pressure of 1.5 pounds per square inch (psi) or less. This class includes snowmobiles, tracked motorcycles, tracked all-terrain vehicles (ATVs), tracked utility terrain vehicles (UTVs), snowcats, and Class 2: over-snow vehicles that typically exert a ground pressure of more than 1.5 psi. This class includes tracked four-wheel drive (4WD) sport utility vehicles (SUVs) and tracked 4WD trucks. There are currently no known conflicts occurring between different classes of OSV use. Snowcats are used for grooming OSV trails. The grooming operations are conducted during the night or during low use timeframes if possible to avoid conflicts with day use. Since snowcats groom the OSV trails, the trails would be wide enough to accommodate larger tracked OSVs in addition to snowmobiles. Class 1 OSVs would

be allowed on all designated OSV trails and areas. Class 2 OSVs would only be allowed on designated OSV trails available for grooming. Only allowing class 2 OSVs on designated OSV trails available for grooming reduces the potential for conflict between different classes of OSVs.

c) Providing an insufficient quantity (miles) of groomed public OSV opportunities.

The 143 miles of trail available for grooming would be less than in the existing conditions (203 miles), there would be a slight loss of groomed OSV trail opportunities under alternative 2 - modified.

Issue 1b. Availability of Non-motorized Winter Recreation Opportunities

a) Reducing the quantity of NFS land available for quiet, non-motorized recreation;

Non-motorized winter recreation enthusiasts would have substantially more acres where OSV use would not be allowed, as compared to existing conditions. There are a total of approximately 346,314 acres across the Plumas National Forest where OSV use would not be designated. Overall, alternative 2 - modified provides substantially more, quiet, non-motorized opportunities than the existing conditions and alternative 4, and fewer quiet non-motorized opportunities than alternatives 3 and 5.

b) Allowing OSV use within areas that currently emphasize non-motorized recreation including Semi-Primitive Areas and Proposed or Recommended Wild and Scenic Rivers and Special Interest Areas;

Wilderness

The existing OSV prohibitions in the Bucks Lake Wilderness area would continue, in compliance with the Wilderness Act. To accommodate current use patterns and reduce potential conflicts between motorized and non-motorized enthusiasts, the high value non-motorized recreation areas north of Bucks Lake Road between the Bucks Summit Staging Area and the east end of Bucks Lake, and within the Black Gulch between the eastern boundary of Bucks Lake Wilderness and Silver Lake Road, south of Silver Lake and north of Bucks Lake Road would not be designated for OSV use. Approximately 1,940 acres would be designated for OSV use adjacent to the Bucks Lake Wilderness, however, based on the reduction of acres designated in the high value non-motorized recreation areas adjacent to Bucks Lake Wilderness, the potential for negative impacts to wilderness characteristics from OSV use would be minimal.

Approximately 7 miles of groomed OSV trails would be designated adjacent to the southern boundary of the Wilderness area, including portions of the Mill Creek Trail, the Four Trees/Bucks Summit trail, and the Cutoff/Lookout Rock trail. Approximately 1.4 miles of the Bald Eagle Mountain trail would be designated and available for grooming along the southwestern boundary of the wilderness. Under existing conditions, this is an ungroomed trail. Allowing grooming to continue beyond the wilderness boundary would help direct OSV riders away from the wilderness boundary as they exit the end of the trail into the adjacent open area. This trail designation would provide a longer groomed OSV trail and a safe turnaround location for the grooming machine. Occasional incursions into the wilderness from the OSV trail system and adjacent areas may continue to occur, although OSV use within areas adjacent to the wilderness would be less than in existing conditions. Ongoing wilderness boundary signage and patrol would address this concern.

The presence of these groomed trails in close proximity to wilderness may temporarily impact outstanding opportunities for solitude, when OSVs are present on the trails. The wilderness

characteristics of natural, undeveloped, special features and manageability are not expected to be impacted by adjacent OSV use. Designating OSV-use trails or areas adjacent to wilderness and proposed wilderness does not, however, reduce the wilderness potential of these areas. Most statewide wilderness acts include what has become known as “buffer zone preclusion language” such as,

Congress does not intend that the designation of wilderness areas ... lead to the creation of protective perimeters or buffer zones around each wilderness area. The fact that nonwilderness activities or uses can be seen or heard from areas within the wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area. (Kelson and Lilieholm 1999).

Virtually identical language has been included in 30 other wilderness statutes enacted since 1980 (Gorte 2011). This concept is also supported by Forest Service Manual 2320.3 that directs consideration of uses on both sides of wilderness boundaries, but states,

Do not maintain buffer strips of undeveloped wildland to provide an informal extension of wilderness. Do not maintain internal buffer zones that degrade wilderness values.

IRAs and Wild and Scenic Rivers

Portions of the Middle Fork IRA that surrounds the Middle Fork Feather River Wild and Scenic River are adjacent to groomed and ungroomed OSV trails where moderate to high OSV use is expected (Ararat Loop and Cold Water loop in the Bucks Area, and Hogback Trail in the La Porte Area). It is anticipated that most OSV use would remain on the trail system (see OSV-use assumptions for analysis) and would not occur within the IRA. OSV use would be designated on 7,164 acres of IRA (within the Bucks Lake, Middle Fork, Chips Creek, Grizzly Peak and West Yuba IRAs), a substantial reduction from existing conditions; and alternative 4, a slight reduction as compared to alternative 3, but more than in alternative 5.

Alternative 2- modified would not impact the potential future designation of any of the IRAs as wilderness. Due to the temporal nature of OSV use and the lack of on-the-ground imprints after snow melt, designating OSV use in portions of IRAs would not preclude any area from being considered as wilderness in the future. Wilderness Inventory under the 2012 Planning Rule and Citizen's Wilderness Inventory The Wilderness Inventory process under the 2012 Planning Rule (FSH 1909.12 - 70 Wilderness) includes the following inventory criteria: Include an area in the inventory when: 1. The area meets the size criteria defined in section 71.21 and has no improvements; or 2. The area meets the size criteria defined in section 71.21 and is consistent with the improvements criteria defined in sections 71.22a and 71.22b. Motorized OSV use over-snow, when snow depth is adequate for that use to occur would not be considered an improvement and would not degrade or disqualify the area for consideration in subsequent wilderness inventory processes.

Pacific Crest National Scenic Trail

Alternative 2 - modified would apply an area not designated for OSV use adjacent to the PCT at Bucks Summit, a congested, high-use staging area; the eastern side of the Middle Fork Wild and Scenic River to provide a noise buffer; and from the general area of Onion Valley to McRae Ridge to include the preservation of historic ski trails. In addition to these non-designated areas, almost 18 miles of the PCT overlies designated wilderness or special areas where OSV use is not allowed. OSV use would be designated within 500 feet of the PCT on 1,717 acres within the Bucks, Lakes Basin, and La Porte OSV areas where motorized roads and trails cross or parallel the PCT, and motorized use is allowed adjacent to the trail in both the summer and winter.

Designation of OSV use within 500 feet of the PCT would be along a total of 14.71 miles of the PCT, consisting of 3.62 miles in the Bucks OSV area, 2.48 miles in the Lakes Basin OSV area, and 8.61 miles in the LaPorte OSV area, as shown on figure 3. Conflict between motorized and non-motorized uses along the trail is most likely to occur in areas that are easily accessible to non-motorized enthusiasts, within 5 miles of plowed trailheads. There are 22.4 miles of the PCT that are located within 5 miles of plowed trailheads. Winter non-motorized use of the PCT, such as cross-country skiing or snowshoeing, is most likely to occur along these 22.4 miles, due to the availability of plowed access and the distance typically traveled per day by winter non-motorized visitors. OSV use adjacent to the trail has the potential to impact trail experience due to the sights and sounds of OSVs in close proximity to the trail. Motorized use adjacent to the PCT may be impacting the nature of the trail as a year-round non-motorized trail, however the potential conflicts with winter non-motorized users on the trail are only anticipated to occur on approximately 662 acres that are located along the 22.4 miles of the PCT that are within 5 miles of plowed trailheads. This would be less potential for conflict than in existing conditions and less than proposed in alternatives 3 and 4, but more than proposed under alternative 5.

Alternative 2 - modified would designate 16 OSV crossings of the PCT located in the Bucks and Lakes Basin OSV analysis areas. The crossing locations in the Lakes Basin have been coordinated with the Tahoe National Forest to provide access to open OSV areas on either side of the trail within the Plumas and Tahoe National Forests. Designating OSV crossings across the PCT would minimize the potential for motorized use to impact the trail experience, consistent with the PCT comprehensive management plan. Limiting the locations where OSVs cross the trail would enhance the quiet, non-motorized experience, while accommodating motorized access to OSV areas and maintaining OSV loop-riding opportunities. Since most OSV crossings of the PCT would primarily use roads identified on the Plumas National Forest's Motor Vehicle Use Map, motorized disturbance to the trail would be at a similar level as could be experienced in the summer months. Identifying designated trails on the OSV-use map would allow PCT visitors to know in advance where they may encounter OSVs crossing the trail, and alerts OSV riders to locations of potential non-motorized recreationists along the trail. This knowledge enhances both public safety and the experience expectations of visitors in these areas. Alternative 2 - modified would minimize potential motorized OSV impacts to the non-motorized PCT experience to a greater extent than alternatives 1, 3, and 4, but less than alternative 5. The proposed areas to be designated, and not designated for OSV use along the PCT provide for multiple uses along the trail, while also giving consideration to the existence of the trail and uses of the trail, consistent with the management direction for the PCT in the Pacific Crest National Scenic Trail Comprehensive Plan and the National Trails System Act.

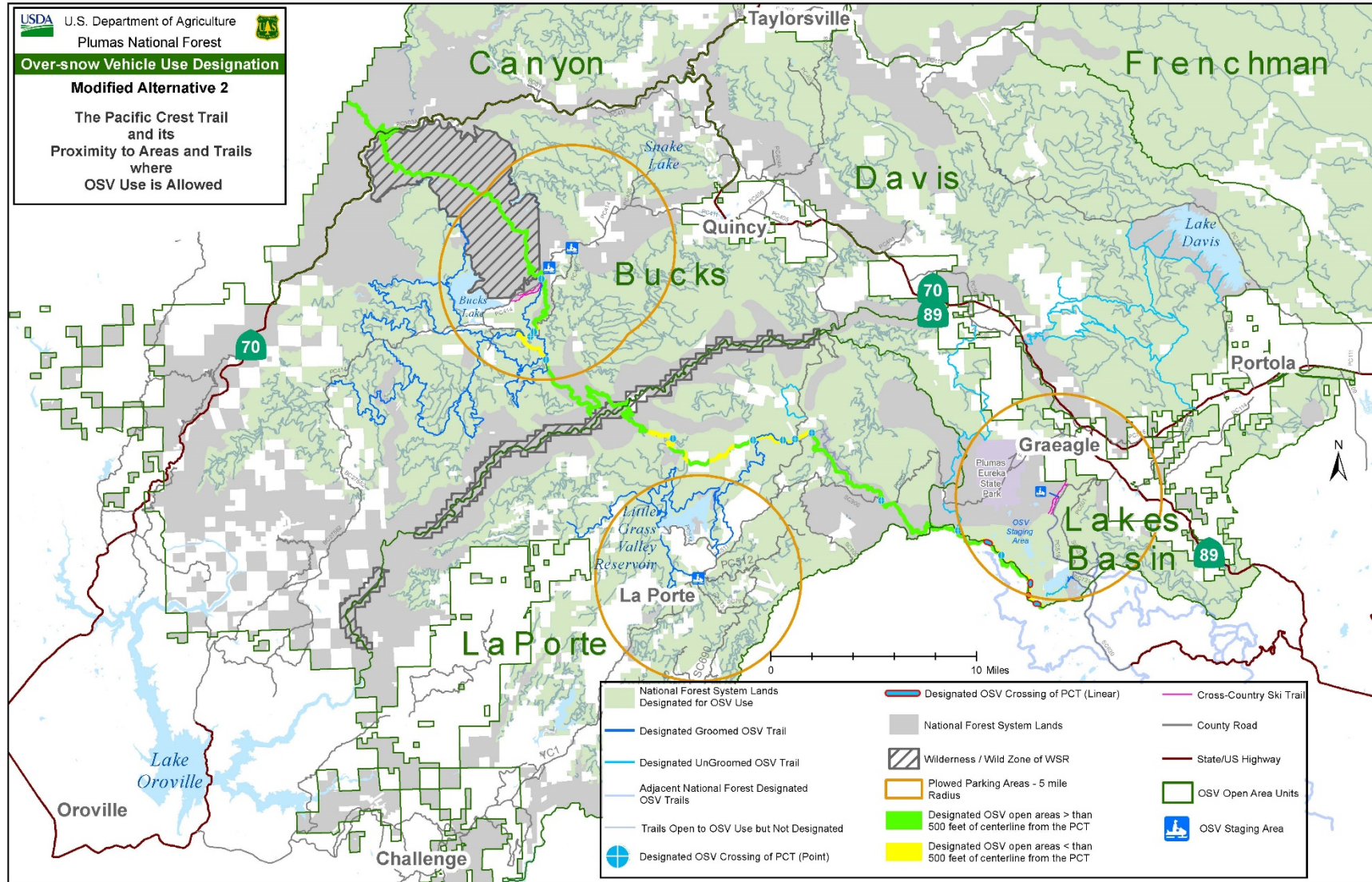


Figure 3. Pacific Crest Trail and its proximity to areas and trails where OSV use is allowed, alternative 2 - modified

c) Increasing the area of overlap between non-motorized (e.g. snowshoeing, cross-country skiing, general snow play) and motorized (i.e., OSV) use;

Motorized OSV use overlaps with areas that are also desirable and accessible to non-motorized enthusiasts (within 5 miles of plowed trailheads) on 84,350 acres. In these locations, potential conflicts are more likely to occur, as motorized OSVs consume untracked powder snow that is desired by backcountry skiers, create tracks across the snow surface making skiing difficult, and create safety concerns in areas where motorized and non-motorized use is occurring at shared trailheads and on shared trails. The overlap of areas desirable for non-motorized uses that are also open to motorized uses in alternative 2 - modified is less than in alternatives 1 and 4, but more than in alternatives 3 and 5.

Based on annual OSV visits to the Plumas National Forest and the acres available for motorized OSV use under alternative 2 - modified, there would be 4,049 designated acres per OSV. Although slightly less than in alternatives 1 and 4, there would still be adequate acres for OSVs to disperse across the designated areas.

d) Increasing the distance of travel required in order to access desirable quiet, non-motorized recreation areas (perhaps to distances further than an enthusiast is physically able to travel);

Non-motorized winter recreation enthusiasts may continue to be displaced in some areas by motorized OSV use. Displacement or conflict may occur where non-motorized enthusiasts are unable to access areas for desired quiet, non-motorized experiences away from the sights, sounds, and smells of motorized use, without traveling long distances through motorized routes and areas, or traveling further than they are physically able to traverse in a typical day. There are approximately 34,700 acres available for high-quality quiet, non-motorized winter activities, and approximately 7.6 miles of cross-country ski trails and 22.4 miles of the PCT within 5 miles of plowed trailheads. These areas are free from motorized use and are easily accessible by non-motorized visitors in a typical day trip. This is a 21,743-acre increase over existing conditions.

Issue 1c. Quality of Winter Recreational Experiences

- a) Consuming untracked powder desired by non-motorized winter recreationists, particularly backcountry downhill skiers;**
- b) Compacting, tracking, and rutting the snow, making the snow surface difficult and potentially unsafe for non-motorized users to cross-country ski, sled, snowshoe, or walk on;**
- c) Creating a real or perceived risk of injury or mortality;**

Opportunities for quality recreation experiences depend on both the settings (physical, social, and managerial aspects), and on the desired experience of the recreationist. Conflicts occur when one recreationist affects or degrades the experience of another. Many non-motorized recreationists experience conflict with motorized recreationists (Adams and McCool 2010). Conflict can result in displacement or the abandonment of the use of a particular trail or area, or a change in time of use (Adams and McCool 2010).

Motorized use has inherent conflicts with non-motorized recreationists who are typically seeking a quiet recreation setting that is not influenced by the sight, sound, or exhaust smell of motorized vehicles. There are also inherent conflicts in that motorized OSVs travel much faster and farther

than non-motorized recreationists. OSV tracks can interfere with cross-country skiing by causing ruts in the trails, and since OSVs travel faster and further than non-motorized recreationists, they often “consume” the fresh powder slopes, limiting opportunities for backcountry skiers who are seeking similar opportunities on snow covered slopes (Snowlands 2014).

Existing areas of conflict (as described in Issue 1c for alternative 1) between motorized and non-motorized winter uses would be mitigated as described in alternative 2 - modified (listed above under the headings, Minimization Measures for Recreation Resources Common to All OSV Areas and Minimization Measures for Recreation Resources by OSV Area) and documented in the minimization criteria worksheets in Volume II, Appendices B and C.

d) Creating noise which may affect solitude and quiet recreational opportunities; and

Under alternative 2 - modified, 858,436 acres would be designated for OSV use and the associated influence of OSV noise. Noise sources of multiple OSVs and vehicles would be concentrated at plowed OSV trailheads, and more dispersed along designated trails and in designated areas (see OSV-use assumptions for analysis). However, only 144,332 acres, or 16.8 percent of the 858,436 acres designated for OSV use, are anticipated to have high to moderate OSV-use levels and the associated higher potential noise impacts.

Ongoing motorized use in close proximity to designated non-motorized areas, such as wilderness (1,940 acres designated for OSV use within ¼ mile of designated Wilderness) and the PCT (OSV use designated within 500 feet of centerline of the PCT on 1,717 acres), temporarily degrades opportunities for solitude near the non-motorized area boundaries, when OSVs are present on the trails. Similarly, there may be temporary impacts to air quality in the vicinity of OSVs.

e) Impacting the scenery by reducing the amount of unaltered views.

Short-term impacts to scenery and the setting for non-motorized experiences occur when OSV tracks through the snow crisscross the landscape, leaving visual evidence of motorized use. The tracks only remain on the landscape until they are covered by additional snowfall or until the snow melts, and do not cause long-term impacts to scenery or the underlying soils and vegetation (see additional analysis in the Soils section beginning on page 366 of this FEIS, and Botany section beginning on page 268 of this FEIS). Potential impacts occur primarily where motorized and non-motorized uses overlap on approximately 84,350 acres. This is less overlap than alternative 1 and 4, but more than alternatives 3 and 5.

Table 21. Resource indicators and measures for alternative 2 - modified direct and indirect effects

Resource Element	Resource Indicator/Measure (Quantify if possible)	Alternative 2 – Modified Proposed Action
1a. Availability of Motorized Over-snow Recreation Opportunities – Designated cross-country areas	Acreage of designated public OSV cross-country use; percent change as compared to current management	858,436 acres open to public, cross-country OSV use, a 25.2 percent decrease from existing conditions. 12 inch snow depth
1a. Availability of Motorized Over-snow Recreation Opportunities - Designated snow trails	Length of designated OSV trails (miles), percent change from current management	226 miles of designated OSV snow trails, subject to snow depth restrictions, 0.44 percent decrease from existing conditions Adequate snow depth to prevent resource damage, typically 6 inch snow depth
1a. Availability of Motorized over-snow recreation Opportunities – Designated, groomed snow trails	Length of groomed OSV trails (miles), percent change from current management	143 miles, 29.5 percent decrease 12 – 18 inch snow depth
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Distance to non-motorized opportunities	Acreage and length of trails (miles) available to non-motorized recreation enthusiasts within 5 miles of plowed trailheads Percent of acres available for quiet, non-motorized use that are considered high-quality non-motorized opportunities based on proximity to plowed trailheads (areas within 5 miles of plowed trailheads) and absence of motorized use	Four plowed trailheads provide access for motorized and non-motorized winter use 34,700 acres available for quiet, non-motorized recreation within 5 miles of plowed trailheads, a 21.743 acre increase from existing conditions 10 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities 7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for quiet, non-motorized recreation within 5 miles of plowed trailheads
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Conflicts with other resource values	Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.)	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Appendices B and C

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Resource Element	Resource Indicator/Measure (Quantify if possible)	Alternative 2 – Modified Proposed Action
1b. Availability of Non-motorized Over-snow Recreation Opportunities -Wilderness	Size of areas (acres) affected and duration of impact. Qualitative description for wilderness attributes.	<p>Opportunities for solitude may be temporarily affected due to the sights and sounds of OSVs near wilderness boundaries.</p> <p>There are approximately 1,940 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Roadless Characteristics	Size of area (acres) affected and duration of impact. Qualitative description for roadless characteristics	<p>Approximately 7,164 IRA acres designated for OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Pacific Crest Trail	Number of crossings; area (acres) where OSV use is allowed within 500 feet of centerline of the PCT	<p>16 designated OSV crossings of the PCT (10 on MVUM roads routes, 2 on County Roads which are on the MVUM as background data, and 4 crossing zones up to 0.25 mile wide).</p> <p>Non-motorized zone adjacent to the PCT at Bucks Summit, the eastern side of the Middle Fork Wild and Scenic River, and from the general area of Onion Valley to McRae Ridge.</p> <p>OSV use designated within 500 feet of centerline of the PCT on 1,717 acres of the PCT.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for Wild and Scenic Attributes	<p>10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Eligible Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for eligible Wild and Scenic Attributes	<p>Approximately 13.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings</p>

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Resource Element	Resource Indicator/Measure (Quantify if possible)	Alternative 2 – Modified Proposed Action
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality motorized opportunities	Percent of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV-use assumption categories	144,332 acres high to moderate OSV use, 16.8 percent of the designated acres are considered high-quality.
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality non-motorized opportunities	Acreage not designated for public cross-country OSV use, percent change as compared to current management	346,314 acres not designated for OSV use, a 508 percent increase
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Solitude	Distance of groomed public OSV snow trails from non-motorized areas	A total of approximately 7 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Noise	Acres and percent of designated acres that are anticipated to have high to moderate OSV-use levels and the associated potential for noise impacts	858,436 acres designated for OSV use and potentially affected by noise; 144,332 acres (16.8 percent) of the acres designated for OSV use are expected to have high to moderate use.
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Scenery	Qualitative/narrative description of potential visual impacts	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Fewer acres designated for cross-country OSV use, and associated visual impacts than in existing conditions and alternative 4. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 84,350 acres

Cumulative Effects – Alternative 2 - Modified

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Past, present, and reasonably foreseeable projects in the area include (past) vegetation management (including commercial thinning, salvage cutting, improvement cutting, and hazard tree removal) in addition to (present) ongoing recreational use of the forest, snow trail grooming, road and parking area plowing, and routine administrative patrols. Three recreational projects that are in progress include the realignment of 800 feet of the Mud Lake Trail; Rehabilitation of the Four Corners OHV Play Area, and construction of 0.95 mile of the Mills Peak Trail South.

Issue 1a. Availability of Motorized Over-snow Recreation Opportunities

Cumulative impacts to the motorized recreation experience are expected to be minimal. Most forest activities, except vegetation treatments, would not take place during the winter when the landscape is covered with snow.

Past vegetation management and fire salvage projects adjacent to groomed OSV trails and in areas designated for cross-country OSV use may enhance opportunities for cross-country OSV use by removing trees that would otherwise obstruct OSV riding. Vegetation treatment, in addition to OSV grooming could cumulatively enhance OSV opportunities.

Issue 1b. Availability of Non-motorized Winter Recreation Opportunities and Issue 1c. Quality of Winter Recreational Experiences

Disturbance from general motorized use and recreational access occurs and will continue to occur throughout the forest indefinitely. We anticipate minimal changes in the existing recreation profile. Other recreational activities that take place off the developed roads, such as the gathering of miscellaneous forest products and hunting, occur within the project area, but because OSV use would generally occur on adequate snowpack, we anticipate no cumulative effects from other ongoing recreational activities.

Noise from OSVs in areas and on trails across the forest would add to other (ongoing, present) sound sources, such as OSV grooming equipment (although overlap is not likely since grooming is done at night, while OSV recreation is during the day), road and parking area plowing equipment, vehicles on plowed portions of highways, airplanes, etc. Cumulative noise across the forest could impact non-motorized enthusiasts who are seeking quiet, non-motorized experiences, however under alternative 2 there would be greater separation of motorized and non-motorized uses in areas that are valued for non-motorized opportunities, such as adjacent to Wilderness, IRAs, and the PCT. With a reduction in total acres where OSV use would be allowed across the Forest, as compared to current management, alternative 2 - modified would likely decrease the cumulative noise impacts.

A general assumption can be made that as an area's population increases over time, visitor use will also increase, along with the potential for use conflicts on the limited public recreation resources. However, OSV use is also dependent on weather conditions and snowpack. OSV use has not increased at the rate that was anticipated in the 2009 State Draft EIR (OHMVR Division 2010). Due to the fluctuations in OSV-use levels and winter conditions, it is difficult to accurately predict whether use conflicts will continue to increase over time. As the climate changes and snow levels are limited to higher elevations, the area in the Plumas National Forest with sufficient snow for OSV use would be reduced. This would potentially lead to a loss of motorized recreation opportunities, or increased use conflicts as both motorized and non-motorized winter visitors are spread across an area with less snow and shorter winter seasons.

Alternative 3

Direct and Indirect Effects - Alternative 3

Issue 1a. Availability of Motorized Over-snow Recreation Opportunities

- a) Eliminating popular, highly desirable areas that have been historically available for public, cross-country OSV-use.**

The seven areas designated for cross-country OSV use under alternative 3 include a total of 600,542 acres of NFS lands. Of the 600,542 acres designated for public cross-country OSV use, 246,815 acres are located in areas that have been identified as having potential for high to moderate OSV use. Based on the high to moderate OSV assumption categories, 41 percent of the designated acres are considered high-quality OSV opportunities.

The forest-wide snow depth requirement of 18 inches for areas and trails designated for OSV use would impose additional restrictions on OSV use, although it is likely that most OSV owners would not ride with less than adequate snow depths to prevent damage to their OSVs. There is a potential for the increased snow depth requirement to shorten the amount of time there would be adequate snow for OSV use in some areas, depending on varying snow conditions. Establishing the forest-wide minimum snow depth for cross-country OSV use would minimize impacts to soil, water, vegetation, and wildlife resources, as described in the relevant sections of this analysis. The 18 inch snow depth requirement for use of OSV trails would be the most restrictive alternative regarding OSV trail use.

- b) Designating an insufficient quantity (miles and acres) of NFS trails and areas for public OSV use.**

There are 547,283 acres of areas currently available for OSV use that would not be designated for OSV use in alternative 3, a 47.7 percent decrease from existing conditions, however OSV use is typically only available on areas above 3,500 feet when there is adequate snowfall for OSV use to occur.

Alternative 3 would slightly decrease the miles of designated OSV trails (220 miles), as compared to the existing conditions (227 miles), providing slightly fewer designated OSV trail opportunities.

- c) Providing an insufficient quantity (miles) of groomed public OSV opportunities.**

Alternative 3 would decrease the miles of designated OSV trails available for grooming (147 miles), as compared to the existing conditions (203 miles), providing fewer groomed trail opportunities.

Issue 1b. Availability of Non-motorized Winter Recreation Opportunities

- a) Reducing the quantity of NFS land available for quiet, non-motorized recreation;**

Non-motorized winter recreation enthusiasts would have considerably more acres where OSV use would not be allowed, as compared to existing conditions. There are a total of approximately 604,208 acres across the Plumas National Forest where OSV use would not be designated. Overall, alternative 3 provides considerably more, quiet, non-motorized opportunities than all other alternatives.

b) Allowing OSV use within areas that currently emphasize non-motorized recreation including Semi-Primitive Areas and Proposed or Recommended Wild and Scenic Rivers and Special Interest Areas;

Wilderness

Alternative 3 would further reduce the potential influence of motorized OSV use adjacent to the Wilderness by not designating OSV use in the areas described in alternative 2 - modified, and on additional acres adjacent to the wilderness. Approximately 225 acres would be designated for OSV use, and 3.5 miles of groomed OSV trails would be designated adjacent to Bucks Lake Wilderness. Alternative 3 would result in less potential for OSV use adjacent to the wilderness than existing conditions and alternative 2 - modified, therefore, there would be less potential for impacts to opportunities for solitude within the wilderness during the winter season, when OSVs are present. The wilderness characteristics of natural, undeveloped, special features and manageability are not expected to be impacted by adjacent OSV use.

IRAs and Wild and Scenic Rivers

Portions of the Middle Fork IRA that surrounds the Middle Fork Feather River Wild and Scenic River are adjacent to groomed and ungroomed OSV trails where moderate to high OSV use is expected (Ararat Loop, Cold Water loop, and Mt. Ararat ungroomed trail in the Bucks Area, and Hogback Trail in the La Porte Area). It is anticipated that most OSV use would remain on the trail system and would not occur within the IRA. OSV use would be designated on 1,760 acres of IRA (including Bucks Lake, Middle Fork, Grizzly Peak, and West Yuba IRAs), a substantial reduction from existing conditions and a reduction from alternative 2 - modified. As discussed under alternative 2, designating OSV use in portions of IRAs would not preclude any area from being considered as wilderness in the future.

Pacific Crest National Scenic Trail

Alternative 3 would generally not designate OSV use adjacent to the PCT, OSV use would only be designated adjacent to the PCT in those areas that are near the groomed OSV trail systems in the Bucks and LaPorte OSV areas, on 1,186 acres within 500 feet of the PCT. Designation of OSV use within 500 feet of the PCT would be along a total of 10.41 miles of the PCT, consisting of 7.7 miles within the Bucks OSV area, and 2.71 miles within the LaPorte area, as shown on figure 4.

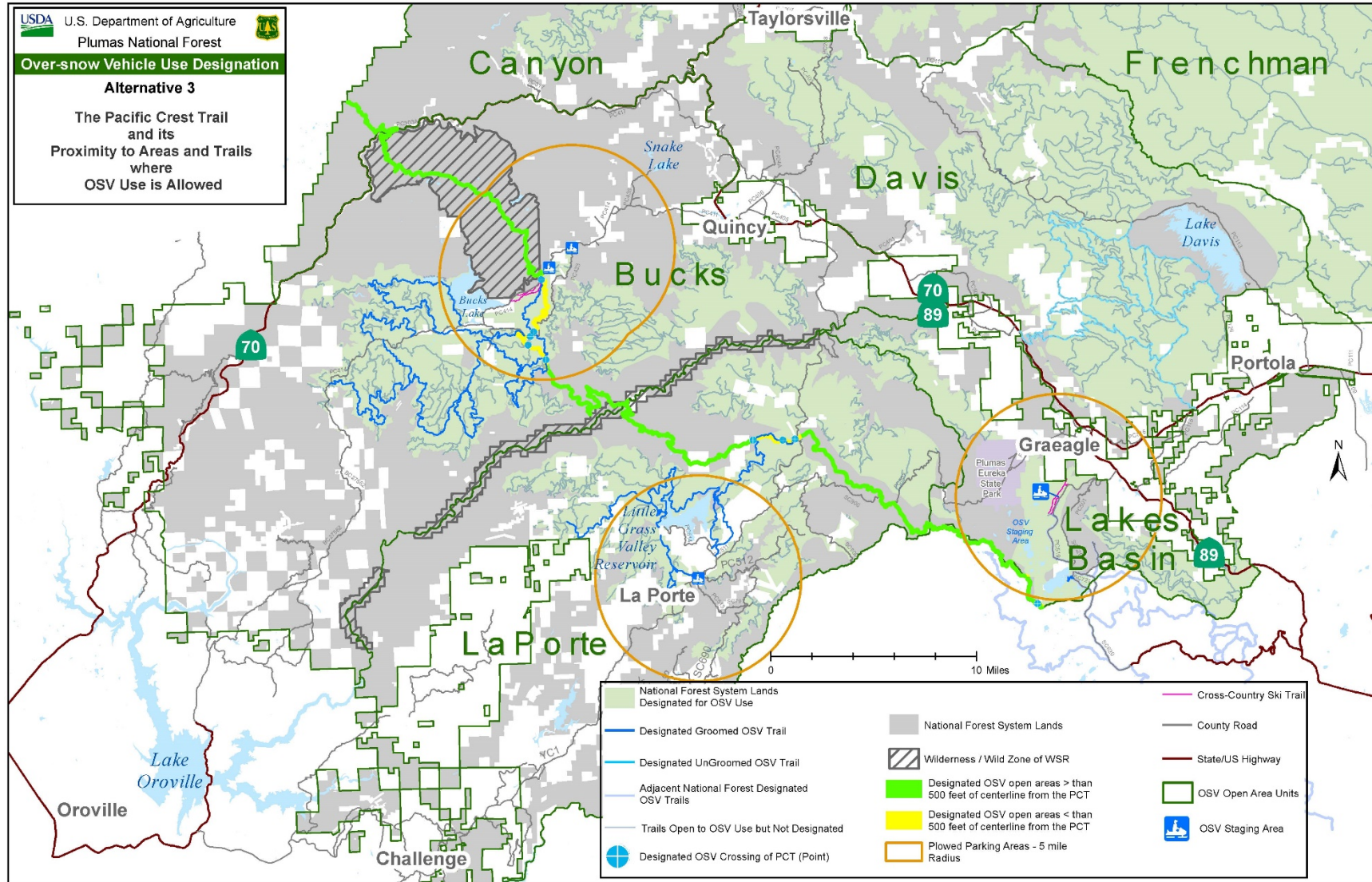


Figure 4. Pacific Crest Trail and its proximity to areas and trails where OSV use is allowed, alternative 3

This would be slightly less OSV use adjacent to the PCT than proposed in alternative 2, much less than in alternatives 1 and 4, but more than in alternative 5. Conflict between motorized and non-motorized uses along the trail is most likely to occur in areas that are easily accessible to non-motorized enthusiasts, within 5 miles of plowed trailheads. There are 22.4 miles of the PCT that are located within 5 miles of plowed trailheads. Winter non-motorized use of the PCT, such as cross-country skiing or snowshoeing, is most likely to occur along these 22.4 miles, due to the availability of plowed access and the distance typically traveled per day by winter non-motorized visitors. OSV use adjacent to the trail has the potential to impact trail experience due to the sights and sounds of OSVs in close proximity to the trail. Motorized use adjacent to the PCT may be impacting the nature of the trail as a year-round non-motorized trail, however the potential conflicts with winter non-motorized users on the trail are only anticipated to occur on approximately 887 acres that are located along the 22.4 miles of the PCT that are within 5 miles of plowed trailheads. This would be less potential for conflict than in existing conditions and as proposed in alternative 4, but more than proposed under alternatives 2 and 5. Nine OSV crossings would be designated across the PCT. Designating OSV crossings across the PCT would minimize the potential for motorized use to impact the trail experience, consistent with the PCT comprehensive management plan. Limiting the locations where OSVs cross the trail would enhance the quiet, non-motorized experience, while accommodating motorized access to OSV areas and maintaining OSV loop-riding opportunities. Since most OSV crossings of the PCT would primarily use roads identified on the Plumas National Forest's Motor Vehicle Use Map, motorized disturbance to the trail would be at a similar level as could be experienced in the summer months. Identifying designated trails on the OSV use map would allow PCT visitors to know in advance where they may encounter OSVs crossing the trail, and alerts OSV riders to locations of potential non-motorized recreationists along the trail. This knowledge enhances both public safety and the experience expectations of visitors in these areas

c) Increasing the area of overlap between non-motorized (e.g. snowshoeing, cross-country skiing, general snow play) and motorized (i.e., OSV) use;

Motorized OSV use overlaps with areas that are also desirable and accessible to non-motorized enthusiasts (within 5 miles of plowed trailheads) on 47,172 acres. In these locations, potential conflicts are more likely to occur, as motorized OSVs consume untracked powder snow that is desired by backcountry skiers, create tracks across the snow surface making skiing difficult, and create safety concerns in areas where motorized and non-motorized use is occurring at shared trailheads and on shared trails. The overlap of areas desirable for non-motorized uses that are also open to motorized uses in alternative 3 is less than all other alternatives.

Based on annual OSV visits to the Plumas National Forest and the acres available for motorized OSV use under alternative 3, there would be 2,833 designated acres per OSV. Although less than all other alternatives, acreage is still adequate for OSVs to disperse across the designated areas.

d) Increasing the distance of travel required in order to access desirable quiet, non-motorized recreation areas (perhaps to distances further than an enthusiast is physically able to travel);

Non-motorized winter recreation enthusiasts may continue to be displaced in some areas by motorized OSV use. Displacement or conflict may occur where non-motorized enthusiasts are unable to access areas for desired quiet, non-motorized experiences away from the sights, sounds, and smells of motorized use, without traveling long distances through motorized routes and areas,

or traveling further than they are physically able to traverse in a typical day. There are approximately 71,146 acres available for high-quality quiet, non-motorized winter activities, and approximately 7.6 miles of cross-country ski trails and 22.4 miles of the PCT within 5 miles of plowed trailheads. These areas are free from motorized use and are easily accessible by non-motorized visitors in a typical day trip. This is a 58,189-acre increase over existing conditions.

Issue 1c. Quality of Winter Recreational Experiences

- a) Consuming untracked powder desired by non-motorized winter recreationists, particularly backcountry downhill skiers;**
- b) Compacting, tracking, and rutting the snow, making the snow surface difficult and potentially unsafe for non-motorized users to cross-country ski, sled, snowshoe, or walk on;**
- c) Creating a real or perceived risk of injury or mortality;**

Existing areas of conflict between motorized and non-motorized winter uses (as described in Issue 1c for alternative 1) would be mitigated as described in alternative 2 - modified, and documented in the minimization criteria worksheets in volume II, appendices D and E.

Alternative 3 emphasizes the quality non-motorized recreation experience, with the least amount of acres designated for OSV use, and the least areas of potential overlap between motorized and non-motorized uses. Therefore, alternative 3 reduces potential conflicts with non-motorized uses to the greatest extent of all alternatives.

- d) Creating noise which may affect solitude and quiet recreational opportunities; and**

Under alternative 3, 600,542 acres would be designated for OSV use and the associated influence of OSV noise. Noise sources of multiple OSVs and vehicles would be concentrated at plowed OSV trailheads, and more dispersed along designated trails and in designated areas (see OSV-use assumptions for analysis). However, only 246,815 acres, or 41 percent of the 600,542 acres designated for OSV use, are anticipated to have high to moderate OSV-use levels and the associated higher potential noise impacts.

Ongoing motorized use in close proximity to the designated non-motorized areas, such as wilderness (225 acres designated for OSV use within 0.25 mile of designated Wilderness) and the PCT (OSV use designated within 500 feet of centerline of the PCT on 1,186 acres), temporarily degrades opportunities for solitude near the non-motorized area boundaries, when OSVs are present. Similarly, there may be temporary impacts to air quality in the vicinity of OSVs. Alternative 3 substantially reduces the acres designated for OSV use within 0.25 mile of designated Wilderness areas, therefore, substantially reducing any potential impacts to opportunities for solitude and air quality, as compared to all other alternatives.

- e) Impacting the scenery by reducing the amount of unaltered views.**

Short-term impacts to scenery and the setting for non-motorized experiences occur when OSV tracks through the snow crisscross the landscape, leaving visual evidence of motorized use. The tracks only remain on the landscape until they are covered by additional snowfall or until the snow melts, and do not cause long-term impacts to scenery or the underlying soils and vegetation (see additional analysis in the Soils and Botany sections of this FEIS). Potential impacts occur primarily where motorized and non-motorized uses overlap on approximately 47,172 acres. This is less overlap than in all other alternatives.

Table 22. Resource indicators and measures for alternative 3 direct and indirect effects

Resource Element	Resource Measure/Measure	Alternative 3
1a. Availability of Motorized Over-snow Recreation Opportunities – Designated cross-country areas	Acreage of designated public OSV cross-country use; percent change as compared to current management	600,542 acres open to public, cross-country OSV use, a 47.7 percent decrease from existing conditions. 18 or more inches of snow or ice covering the landscape, to prevent impacts to surface and subsurface.
1a. Availability of Motorized Over-snow Recreation Opportunities – Designated snow trails	Length of designated OSV trails (miles), percent change from current management	220 miles of designated OSV snow trails, subject to snow depth restrictions. 3 percent increase from existing conditions. 18 or more inches of snow or ice covering the trail, to prevent impacts to surface and subsurface.
1a. Availability of Motorized over-snow recreation Opportunities – Designated, groomed snow trails	Length of groomed OSV trails (miles), percent change from current management	220 miles, 8.4 percent increase from existing conditions 12 inch snow depth for snow trail grooming to occur
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Distance to non-motorized opportunities	Acreage and length of trails (miles) available to non-motorized recreation enthusiasts within 5 miles of plowed trailheads Percentage of acres available for quiet, non-motorized use that are considered high-quality non-motorized opportunities based on proximity to plowed trailheads (areas within 5 miles of plowed trailheads) and absence of motorized use	Four plowed trailheads provide access for motorized and non-motorized winter use 71,146 acres available for non-motorized recreation within 5 miles of plowed trailheads, a 58,189-acre increase from existing conditions. 11.9 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities 7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Conflicts with other resource values	Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.)	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Appendices B and C

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Resource Element	Resource Measure/Measure	Alternative 3
1b. Availability of Non-motorized Over-snow Recreation Opportunities -Wilderness	Size of areas (acres) affected and duration of impact. Qualitative description for wilderness attributes.	<p>Opportunities for solitude maybe temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 225 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Roadless Characteristics	Size of area (acres) affected and duration of impact. Qualitative description for roadless characteristics	<p>Approximately 8,348 IRA acres designated for OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Pacific Crest Trail	Number of crossings; area (acres) where OSV use is allowed within 500 feet of centerline of the PCT	<p>9 designated OSV crossings of the PCT (8 on MVUM roads and 1 on a motorized trail)</p> <p>OSV use designated within 500 feet of centerline of the PCT on 1,186 acres of the PCT</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for Wild and Scenic Attributes	<p>10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Eligible Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for eligible Wild and Scenic Attributes	<p>Approximately 5.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings</p>
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality motorized opportunities	Percentage of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV-use assumption categories	<p>246,815 acres high to moderate OSV use, 41 percent of the designated acres are considered high-quality</p>
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality non-motorized opportunities	Acreage not designated for public cross-country OSV use, percent change as compared to current management	<p>604,208 acres not designated for OSV use, a 961 percent increase</p>

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Resource Element	Resource Measure/Measure	Alternative 3
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Solitude	Distance of groomed public OSV snow trails from non-motorized areas	A total of approximately 3.5 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Noise	Acres and percent of designated acres that are anticipated to have high to moderate OSV-use levels and the associated potential for noise impacts	600,542 acres designated for OSV use and potentially affected by noise; 246,815 acres (41 percent) of the acres designated for OSV use are expected to have high to moderate use.
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Scenery	Qualitative/narrative description of potential visual impacts	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Fewer acres designated for cross-country OSV use, and associated visual impacts than all other alternatives. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 47,172 acres

Cumulative Effects – Alternative 3

The cumulative effects of alternative 3 would be the similar to those described for alternative 2 - modified, although potential effects would occur across fewer acres designated for OSV use.

Alternative 4

Direct and Indirect Effects - Alternative 4

Issue 1a. Availability of Motorized Over-snow Recreation Opportunities

a) Eliminating popular, highly desirable areas that have been historically available for public, cross-country OSV-use

The seven areas designated for cross-country OSV use under alternative 4 include a total of 1,160,793 acres of NFS lands. Of the 1,160,793 acres designated for public cross-country OSV use, 682,877 acres are located in areas that have been identified as having potential for high to moderate OSV use. Based on the high to moderate OSV assumption categories, 58.8 percent of the designated acres are considered high-quality OSV opportunities.

The forest-wide snow depth requirement of 12 inches for areas designated for OSV use would impose additional restrictions on OSV use, although it is likely that most OSV owners would not ride with less than adequate snow depths to prevent damage to their OSVs. Establishing the forest-wide minimum snow depth for cross-country OSV use would minimize impacts to soil, water, vegetation, and wildlife resources, as described in the relevant sections of this analysis. Designating public OSV use on snow trails when there is adequate snow depth to avoid damage to natural and cultural resources would provide improved trail access for OSVs to reach areas of higher terrain with adequate snow depths. This would be less restrictive than any other alternative regarding snow depth and would allow maximum access to OSV trails throughout the winter season.

b) Designating an insufficient quantity (miles and acres) of NFS trails and areas for public OSV use.

There are 12,968 acres of areas not currently available for OSV use within the Canyon, Davis, Frenchman, Lakes Basin, and La Porte OSV areas that would be designated for OSV use in alternative 4, an increase of 1.1 percent from existing conditions, however OSV use is typically only available on areas above 3,500 feet when there is adequate snowfall for OSV use to occur. Alternative 4 would slightly increase the total acres available to cross-country OSV, but is most similar to the OSV opportunities that are available under existing conditions. Alternative 4 would increase the miles of designated OSV trails to the greatest extent of all alternatives (adding 523 miles). Alternative 4 would provide more areas where OSV use would be designated than the other action alternatives, enhancing opportunities for motorized experiences across the forest to the greatest extent.

c) Providing an insufficient quantity (miles) of groomed public OSV opportunities.

Alternative 4 would increase the miles of trails available for grooming to the greatest extent of all alternatives (577 miles), substantially increasing the amount of groomed trail riding opportunities that could be provided.

Issue 1b. Availability of Non-motorized Winter Recreation Opportunities

a) Reducing the quantity of NFS land available for quiet, non-motorized recreation;

Non-motorized winter recreation enthusiasts would have slightly fewer acres where OSV use would not be allowed, as compared to existing conditions. There are a total of approximately 43,957 acres across the Plumas National Forest where OSV use would not be designated. Overall, alternative 4 provides the least quiet, non-motorized opportunities of all alternatives.

b) Allowing OSV use within areas that currently emphasize non-motorized recreation including Semi-Primitive Areas and Proposed or Recommended Wild and Scenic Rivers and Special Interest Areas;

Wilderness

Alternative 4 would designate areas for OSV use adjacent to the wilderness, to the same extent as under existing conditions. Approximately 4,646 acres would be designated for OSV use, and 5 miles of groomed OSV trails would be designated adjacent to Bucks Lake Wilderness. Alternative 4 would result in the same potential for OSV use adjacent to the wilderness as in existing conditions, and more than in alternatives 2 - modified and 3. Occasional incursions into the wilderness from the OSV trail system and adjacent areas would likely continue to occur. Ongoing wilderness boundary signage and patrol would address this concern. The presence of the OSV trails or areas and grooming in close proximity to wilderness may temporarily impact outstanding opportunities for solitude, during the winter, when there is adequate snow for OSVs to be present. When OSVs are present, they may be seen or heard from within the wilderness and may impact opportunities for solitude. The wilderness characteristics of natural, undeveloped, special features and manageability are not expected to be impacted by adjacent OSV use.

IRAs and Wild and Scenic Rivers

Portions of the Middle Fork IRA that surrounds the Middle Fork Feather River Wild and Scenic River are adjacent to groomed and ungroomed OSV trails where moderate to high OSV use is expected (Ararat Loop, Cold Water loop, and Mt Ararat ungroomed trail in the Bucks Area, and Hogback Trail in the La Porte Area). It is anticipated that most OSV use would remain on the trail system and would not occur within the IRA. OSV use would be designated on 64,612 acres of IRA (within the Bald Rock, Bucks Lake, Middle Fork, Chips Creek, Grizzly Peak, Adams Peak, and West Yuba IRAs), slightly more than under existing conditions. Although designating additional acres of IRA for OSV use may increase the potential for impacts to opportunities for solitude in the area when OSVs are present, as discussed under alternative 2, designating OSV use in portions of IRAs would not preclude any area from being considered as wilderness in the future.

Pacific Crest National Scenic Trail

Alternative 4 would designate OSV use adjacent to approximately 5,294 acres of the PCT, similar to existing conditions, but more OSV use adjacent to the PCT than proposed in alternatives 2 - modified, 3, and 5. Designation of OSV use within 500 feet of the PCT would be along a total of 48.62 miles, consisting of 17.18 miles in the Bucks OSV area, 3.95 miles in the Canyon OSV area, 2.67 miles in the Lakes Basin OSV area, and 24.82 miles in the LaPorte OSV area, as shown on figure 5. Conflict between motorized and non-motorized uses along the trail is most likely to occur in areas that are easily accessible to non-motorized enthusiasts, within 5 miles of plowed trailheads. There are 22.4 miles of the PCT that are located within 5 miles of plowed trailheads. Winter non-motorized use of the PCT, such as cross-country skiing or snowshoeing, is most likely to occur along these 22.4 miles, due to the availability of plowed access and the distance typically

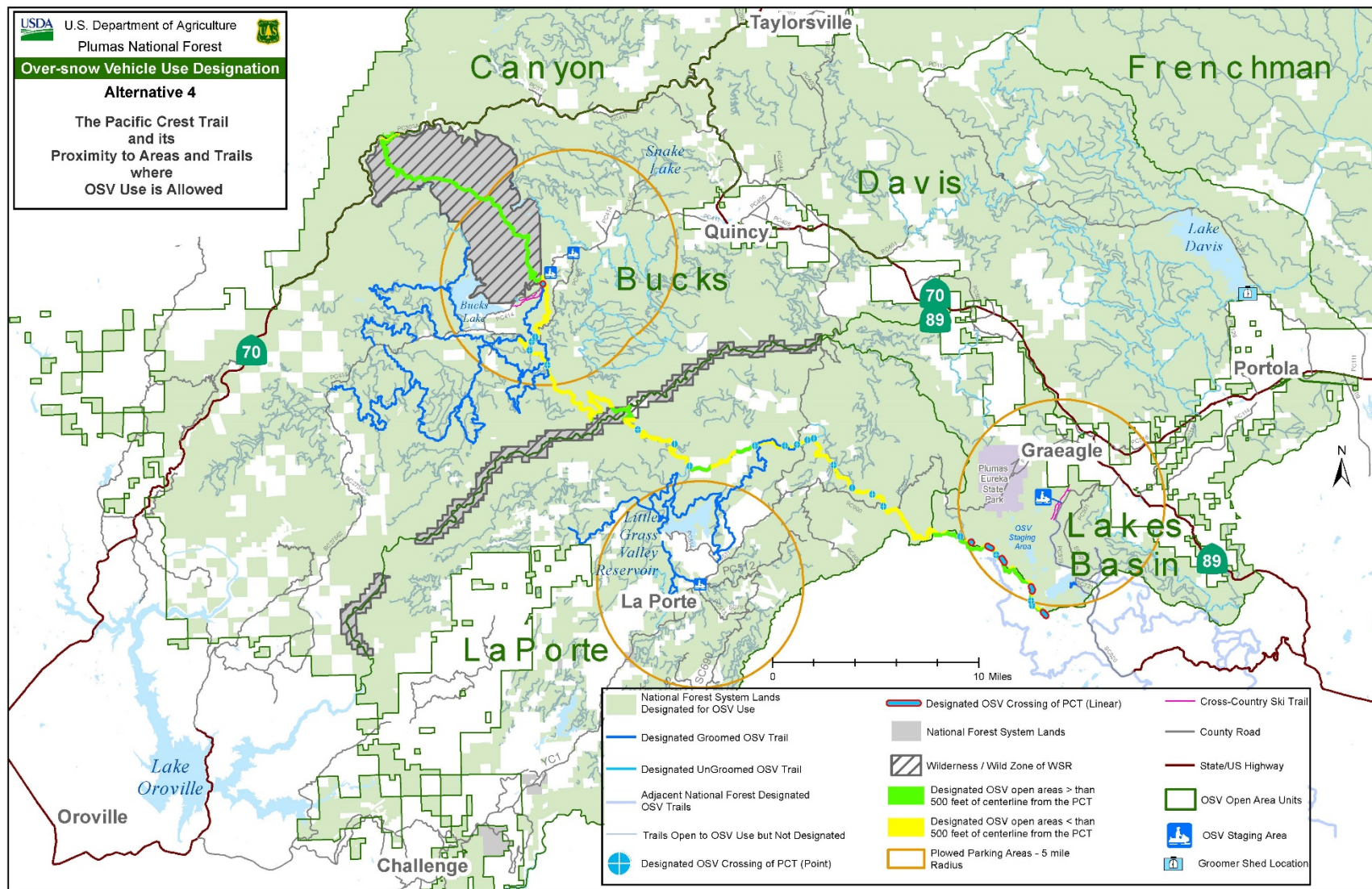


Figure 5. Pacific Crest Trail and its proximity to areas and trails where OSV use is allowed, alternative 4

traveled per day by winter non-motorized visitors. OSV use adjacent to the trail has the potential to impact trail experience due to the sights and sounds of OSVs in close proximity to the trail. Motorized use adjacent to the PCT may be impacting the nature of the trail as a year-round non-motorized trail, however the potential conflicts with winter non-motorized users on the trail are only anticipated to occur on approximately 1,243 acres that are located along the 22.4 miles of the PCT that are within 5 miles of plowed trailheads. This would be similar to existing conditions, but more potential for conflict than proposed in alternatives 2, 3, and 5. There would be 31 OSV crossings designated across the PCT. The crossing locations in the Lakes Basin have been coordinated with the Tahoe National Forest to provide access to open OSV areas on either side of the trail within the Plumas and Tahoe National Forests. Designating OSV crossings of the Pacific Crest Trail would minimize the potential for motorized use to impact the trail experience, consistent with the PCT comprehensive management plan. Limiting the locations where OSVs cross the trail would enhance the quiet, non-motorized experience while accommodating motorized access to OSV areas and maintaining OSV loop-riding opportunities. Since OSV crossings of the PCT would primarily use roads identified on the Plumas National Forest's Motor Vehicle Use Map, motorized disturbance to the trail would be at a similar level as could be experienced in the summer months. Identifying designated crossings on the OSV-use map would allow PCT visitors to know in advance where they may encounter OSVs crossing the trail, and alerts OSV riders to locations of potential non-motorized recreationists along the trail. This knowledge enhances both public safety and the experience expectations of visitors in these areas. Alternative 4 would have the highest number of PCT crossings of any of the alternatives and impact the PCT to the greatest extent compared to all other action alternatives.

Challenge Experimental Forest

The Challenge Experimental Forest was established in 1942, by the Chief of the Forest Service with review and support from the Pacific Southwest Regional Forester and Research Station Direction. The designated area was established for two main reasons: (1) accessibility of second-growth timber, and (2) the "belt" where the ponderosa pine grows much faster than almost anywhere in its range. The designated area totals approximately 2,250 acres and elevations range from 2,400 to 3,200 feet. The paramount value of this area is for timber production and there are no other values for public use.

The 1988 Plumas National Forest Land and Resource Management Plan developed a prescription specific to the Challenge Experimental Forest, including general direction and standards and guidelines (USDA Forest Service 1988, pp.4-78 – 4-79). With regard to recreation, the general direction for Challenge Experimental Forest encourages only recreation that is compatible with PSW projects, and identifies standards and guidelines that prohibit ORV use and limiting dispersed recreation (Ibid, p. 4-78). "ORV" is defined as "Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice, marsh, swampland, or other natural terrain" (Plumas National Forest EIS for LRMP, Glossary, Definitions, p. 29).

The Challenge Experimental Forest is a designated area established for research purposes. Given that the designated area is low in elevation, surrounded by private land, about 0.03 percent of NFS lands within the Plumas National Forest, and uses are currently restricted to activities compatible with PSW project, the substantive requirements for ecosystem services and multiple use would not be met by allowing public OSV use within the designated area. The responsible official has determined to not amend the Forest Plan.

c) Increasing the area of overlap between non-motorized (e.g. snowshoeing, cross-country skiing, general snow play) and motorized (i.e., OSV) use;

Motorized OSV use overlaps with areas that are also desirable and accessible to non-motorized enthusiasts (within 5 miles of plowed trailheads) on 106,282 acres. In these locations, potential conflicts are more likely to occur, as motorized OSVs consume untracked powder snow that is desired by backcountry skiers, create tracks across the snow surface making skiing difficult, and creating safety concerns in areas where motorized and non-motorized use is occurring at shared trailheads and on shared trails. The overlap of areas desirable for non-motorized uses that are also open to motorized uses in alternative 4 is approximately the same as in existing condition, and more than in alternatives 2 - modified, 3, and 5. Based on annual OSV visits to the Plumas National Forest and the acres available for motorized OSV use under alternative 4, there would be 5,475 designated acres per OSV. This is slightly more than under existing conditions, and acreage would be adequate for OSVs to disperse across the designated areas.

d) Increasing the distance of travel required in order to access desirable quiet, non-motorized recreation areas (perhaps to distances further than an enthusiast is physically able to travel);

Non-motorized winter recreation enthusiasts would continue to be displaced in some areas by motorized OSV use, or be unable to access areas for desired quiet, non-motorized experiences away from the sights, sounds, and smells of motorized use, since they would have to travel longer distances through motorized routes and areas than they are physically able to traverse. However, there would be 12,957 acres available for quiet, non-motorized winter activities (consisting of areas where motorized use is prohibited under the Forest Plan) and 7.6 miles of cross-country ski trails and 22.4 miles of the PCT within 5 miles of plowed trailheads. This is the same as existing conditions.

Issue 1c. Quality of Winter Recreational Experiences

- a) Consuming untracked powder desired by non-motorized winter recreationists, particularly backcountry downhill skiers;**
- b) Compacting, tracking, and rutting the snow, making the snow surface difficult and potentially unsafe for non-motorized users to cross-country ski, sled, snowshoe, or walk on;**
- c) Creating a real or perceived risk of injury or mortality;**

Alternative 4 emphasizes the quality motorized recreation experience and would designate the most acres for OSV use of any alternative. The areas of potential overlap between motorized and non-motorized uses is also increased to the greatest extent by alternative 4, therefore resulting in the highest potential for ongoing conflicts (as described in Issue 1c for alternative 1).

d) Creating noise which may affect solitude and quiet recreational opportunities; and

Under alternative 4, 1,160,793 acres would be designated for OSV use and the associated influence of OSV noise. Noise sources of multiple OSVs and vehicles would be concentrated at plowed OSV trailheads, and more dispersed along designated trails and in designated areas (see OSV-use assumptions for analysis). However, only 682,877 acres, or 58.8 percent of the 1,160,793 acres designated for OSV use, are anticipated to have high to moderate OSV-use levels and the associated higher potential noise impacts.

Ongoing motorized use in close proximity to the designated non-motorized areas, such as wilderness (4,646 acres designated for OSV use within 0.25 mile of designated Wilderness) and the PCT (OSV use designated within 500 feet of centerline of the PCT on 5,294 acres), temporarily degrades opportunities for solitude near the non-motorized area boundaries, when OSVs are present on the trails. Similarly, there may be temporary impacts to air quality in the vicinity of OSVs.

e) Impacting the scenery by reducing the amount of unaltered views.

Short-term impacts to scenery and the setting for non-motorized experiences occur when OSV tracks through the snow crisscross the landscape, leaving visual evidence of motorized use. The tracks only remain on the landscape until they are covered by additional snowfall or until the snow melts, and do not cause long-term impacts to scenery or the underlying soils and vegetation (see additional analysis in the Soils section beginning on page 377 of this FEIS, and Botany section beginning on page 281 of this FEIS). Potential impacts occur primarily where motorized and non-motorized uses overlap on approximately 106,282 acres. This is more overlap than in all other alternatives.

Cumulative Effects – Alternative 4

The cumulative effects of alternative 4 would be similar to those described for alternative 2 –modified; however, with additional acres and trails designated for OSV use, the potential impacts may be greater than all other action alternatives.

Table 23. Resource indicators and measures for alternative 4 direct and indirect effects

Resource Element	Measure	Alternative 4
1a. Availability of Motorized Over-snow Recreation Opportunities – Designated cross-country areas	Acreage of designated public OSV cross-country use; percent change as compared to current management	1,160,793 acres open to public, cross-country OSV use, a 1.1 percent increase from existing conditions. 12 or more inches of snow or ice covering the landscape, to prevent impacts to surface and subsurface.
1a. Availability of Motorized Over-snow Recreation Opportunities - Designated snow trails	Length of designated OSV trails (miles), percent change from current management	577 miles of designated OSV snow trails, subject to snow depth restrictions. 154 percent increase from existing conditions. OSV use on trails would be allowed when there is adequate snow depth to avoid damage to natural and cultural resources.
1a. Availability of Motorized over-snow recreation Opportunities – Designated, groomed snow trails	Length of groomed OSV trails (miles), percent change from current management	577 miles, 207 percent increase from existing conditions No minimum snow depth requirement for grooming to occur.
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Distance to non-motorized opportunities	Acreage and length of trails (miles) available to non-motorized recreation enthusiasts within 5 miles of plowed trailheads Percent of acres available for quiet, non-motorized use that are considered high-quality non-motorized opportunities based on proximity to plowed trailheads (areas within 5 miles of plowed trailheads) and absence of motorized use	Four plowed trailheads provide access for motorized and non-motorized winter use, 12,957 acres available for non-motorized recreation within 5 miles of plowed trailheads, no change from existing conditions 29.5 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities 7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Conflicts with other resource values	Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.)	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Appendices B and C

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Resource Element	Measure	Alternative 4
1b. Availability of Non-motorized Over-snow Recreation Opportunities - Wilderness	Size of areas (acres) affected and duration of impact. Qualitative description for wilderness attributes.	<p>Opportunities for solitude maybe temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 4,646 acres designated for OSV use within 0.25 mile of designated wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Roadless Characteristics	Size of area (acres) affected and duration of impact. Qualitative description for roadless characteristics	<p>Approximately 64,613 IRA acres designated for OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation maybe temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Pacific Crest Trail	Number of crossings; area (acres) where OSV use is allowed within 500 feet of centerline of the PCT	<p>31 designated OSV crossings of the PCT (25 MVUM roads and 6 linear features that would be wider than a road)</p> <p>OSV use designated within 500 feet of centerline of the PCT on 5,294 acres of the PCT</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for Wild and Scenic Attributes	<p>10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of wild and scenic rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Eligible Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for eligible Wild and Scenic Attributes	<p>Approximately 43.5 miles of eligible wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings</p>
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality motorized opportunities	Percent of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV-use assumption categories	<p>682,877 acres high to moderate OSV use, 58.8 percent of the designated acres are considered high-quality.</p>
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality non-motorized opportunities	Acreage not designated for public cross-country OSV use, percent change as compared to current management	<p>43,957 acres not designated for OSV use, a 22.8 percent decrease</p>

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Resource Element	Measure	Alternative 4
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Solitude	Distance of groomed public OSV snow trails from non-motorized areas	A total of approximately 5 miles of groomed OSV trails plus approximately 3 miles of potential groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Noise	Acres and percent of designated acres that are anticipated to have high to moderate OSV-use levels and the associated potential for noise impacts	1,160,793 acres designated for OSV use and potentially affected by noise; 682,877 acres (58.8 percent) of the acres designated for OSV use are expected to have high to moderate use.
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Scenery	Qualitative/narrative description of potential visual impacts	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Slightly more acres designated for cross-country OSV use, and associated visual impacts than in existing conditions. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 106,282 acres

Alternative 5

Direct and Indirect Effects - Alternative 5

Issue 1a. Availability of Motorized Over-snow Recreation Opportunities

- a) Eliminating popular, highly desirable areas that have been historically available for public, cross-country OSV-use**

The seven areas designated for cross-country OSV use under alternative 5 include a total of 651,877 acres of NFS lands. Of the 651,877 acres designated for public cross-country OSV use, 246,816 acres are located in areas that have been identified as having potential for high to moderate OSV use. Based on the high to moderate OSV assumption categories, 37.9 percent of the designated acres are considered high-quality OSV opportunities.

The forest-wide snow depth requirement of 24 inches for areas and 12 inches for trails designated for OSV use would impose additional restrictions on OSV use, although it is likely that most OSV owners would not ride with less than adequate snow depths to prevent damage to their OSVs. There is a potential for the increased snow depth requirement to shorten the amount of time there would be adequate snow for OSV use in some areas, depending on varying snow conditions. Establishing the forest-wide minimum snow depth for cross-country OSV use would minimize impacts to soil, water, vegetation, and wildlife resources, as described in the relevant sections of this analysis.

- b) Designating an insufficient quantity (miles and acres) of NFS trails and areas for public OSV use.**

There are 495,948 acres of areas currently available for OSV use that would not be designated for OSV use in alternative 5, however OSV use is typically only available on areas above 3,500 feet when there is adequate snowfall for OSV use to occur. Alternative 5 would reduce the total acres available to cross-country OSV use more than alternatives 1, 2 - modified, and 4, and would designate slightly more acres than alternative 3. Alternative 5 would reduce the total miles of designated OSV trails (210 miles) more than all other alternatives.

Two classes of OSV have been identified, including class 1: over-snow vehicles that typically exert a ground pressure of 1.5 pounds per square inch (psi) or less. This class includes snowmobiles, tracked motorcycles, tracked all-terrain vehicles (ATVs), tracked utility terrain vehicles (UTVs), snowcats, and Class 2: over-snow vehicles that typically exert a ground pressure of more than 1.5 psi. This class includes tracked four-wheel drive (4WD) sport utility vehicles (SUVs) and tracked 4WD trucks. There are currently no known conflicts occurring between different classes of OSV use. Snowcats are used for grooming OSV trails. The grooming operations are conducted during the night or during low use timeframes if possible to avoid conflicts with day use. Since snowcats groom the OSV trails, the trails would be wide enough to accommodate larger tracked OSVs in addition to snowmobiles. Class 1 OSVs would be allowed on all designated OSV trails and areas. Class 2 OSVs would only be allowed on designated OSV trails available for grooming. Only allowing the larger, class 2 OSVs on designated OSV trails available for grooming reduces the potential for conflict between different classes of OSVs.

c) Providing an insufficient quantity (miles) of groomed public OSV opportunities.

Alternative 5 would slightly increase the total miles of designated OSV trails available for grooming (210 miles) as compared to existing conditions (203) miles, and alternative 2 – modified (143 miles), but would be fewer miles than proposed in alternative 3 (220 miles) or alternative 4 (577 miles). This slight increase in OSV trails available for grooming would be a slightly positive change from existing conditions for groomed OSV trail opportunities.

Issue 1b. Availability of Non-motorized Winter Recreation Opportunities

a) Reducing the quantity of NFS land available for quiet, non-motorized recreation;

Non-motorized winter recreation enthusiasts would have substantially more acres where OSV use would not be allowed, as compared to existing conditions. There are a total of approximately 552,873 acres across the Plumas National Forest where OSV use would not be designated. Overall, alternative 5 provides substantially more, quiet, non-motorized opportunities than the existing conditions and alternatives 2 - modified and 4, and slightly fewer quiet non-motorized opportunities than alternative 3.

b) Allowing OSV use within areas that currently emphasize non-motorized recreation including Semi-Primitive Areas and Proposed or Recommended Wild and Scenic Rivers and Special Interest Areas;

Wilderness

Alternative 5 would further reduce the potential influence of motorized OSV use adjacent to the Wilderness by not designating OSV use in the areas described in alternative 2 - modified, and on additional acres adjacent to the Wilderness. Approximately 1,423 acres would be designated for OSV use, and 3.5 miles of groomed OSV trails would be designated adjacent to Bucks Lake Wilderness. Alternative 5 would result in less potential for OSV use adjacent to the Wilderness than existing conditions and alternatives 2 - modified and 5, and would be similar to alternative 3. The presence of the OSV trails or areas and grooming in close proximity to wilderness may temporarily impact outstanding opportunities for solitude, during the winter, when there is adequate snow for OSVs to be present. When OSVs are present, they may be seen or heard from within the wilderness and may impact opportunities for solitude. The wilderness characteristics of natural, undeveloped, special features and manageability are not expected to be impacted by adjacent OSV use.

IRAs and Wild and Scenic Rivers

Portions of the Middle Fork IRA that surrounds the Middle Fork Feather River Wild and Scenic River are adjacent to groomed and ungroomed OSV trails where moderate to high OSV use is expected (Ararat Loop, Cold Water loop, and Mt Ararat ungroomed trail in the Bucks Area, and Hogback Trail in the La Porte Area). It is anticipated that most OSV use would remain on the trail system and would not occur within the IRA. OSV use would not be designated within IRAs in alternative 5, and this alternative provides the most protection of IRA characteristics of all alternatives.

Pacific Crest National Scenic Trail

Alternative 5 would not designate OSV use immediately adjacent to the PCT. This would be less OSV use adjacent to the PCT than proposed in all other alternatives. Conflict between motorized and non-motorized uses along the trail is most likely to occur in areas that are easily accessible to non-motorized enthusiasts, within 5 miles of plowed trailheads. There are 22.4 miles of the PCT

that are located within 5 miles of plowed trailheads. Winter non-motorized use of the PCT, such as cross-country skiing or snowshoeing, is most likely to occur along these 22.4 miles, due to the availability of plowed access and the distance typically traveled per day by winter non-motorized visitors. OSV use adjacent to the trail has the potential to impact trail experience due to the sights and sounds of OSVs in close proximity to the trail. Motorized use adjacent to the PCT is not anticipated to impact the nature of the trail as a year-round non-motorized trail, since motorized use would not be designated within 500 feet of the PCT, this would result in less potential for conflict with non-motorized visitors than in all other alternatives. Sixteen OSV crossings would be designated across the PCT. Designating OSV crossings of the PCT would minimize the potential for motorized use to impact the trail experience, consistent with the PCT comprehensive management plan. Limiting the locations where OSVs cross the trail would enhance the quiet, non-motorized experience, while accommodating motorized access to OSV areas and maintaining OSV loop-riding opportunities. The number of designated OSV crossings of the PCT would be more than in alternatives 1 and 3, but fewer than in alternatives 2 and 4. Since OSV crossings across the PCT would primarily use roads identified on the Plumas National Forest's Motor Vehicle Use Map, motorized disturbance to the trail would be at a similar level as could be experienced in the summer months. Identifying designated trails on the OSV-use map would allow PCT visitors to know in advance where they may encounter OSVs crossing the trail, and alerts OSV riders to locations of potential non-motorized recreationists along the trail. This knowledge enhances both public safety and the experience expectations of visitors in these areas. (figure 6)

c) Increasing the area of overlap between non-motorized (e.g. snowshoeing, cross-country skiing, general snow play) and motorized (i.e., OSV) use;

Motorized OSV use overlaps with areas that are also desirable and accessible to non-motorized enthusiasts (within 5 miles of plowed trailheads) on 49,349 acres. In these locations, potential conflicts are more likely to occur, as motorized OSVs consume untracked powder snow that is desired by backcountry skiers, create tracks across the snow surface making skiing difficult, and creating safety concerns in areas where motorized and non-motorized use is occurring at shared trailheads and on shared trails. The overlap of areas desirable for non-motorized uses that are also open to motorized uses in alternative 5 is slightly more than in alternative 3, but less than in existing condition, and alternatives 2 -modified and 4.

Based on annual OSV visits to the Plumas National Forest and the acres available for motorized OSV use under alternative 5, there would be 3,075 designated acres per OSV. Although less than in the existing conditions and alternatives 2 - modified and 4, there would be adequate acres for OSVs to disperse across designated acres.

d) Increasing the distance of travel required in order to access desirable quiet, non-motorized recreation areas (perhaps to distances further than an enthusiast is physically able to travel);

Non-motorized winter recreation enthusiasts may continue to be displaced in some areas by motorized OSV use. Displacement or conflict may occur where non-motorized enthusiasts are unable to access areas for desired quiet, non-motorized experiences away from the sights, sounds, and smells of motorized use, without traveling long distances through motorized routes and areas, or traveling further than they are physically able to traverse in a typical day. There are approximately 69,685 acres available for high-quality quiet, non-motorized winter activities, and

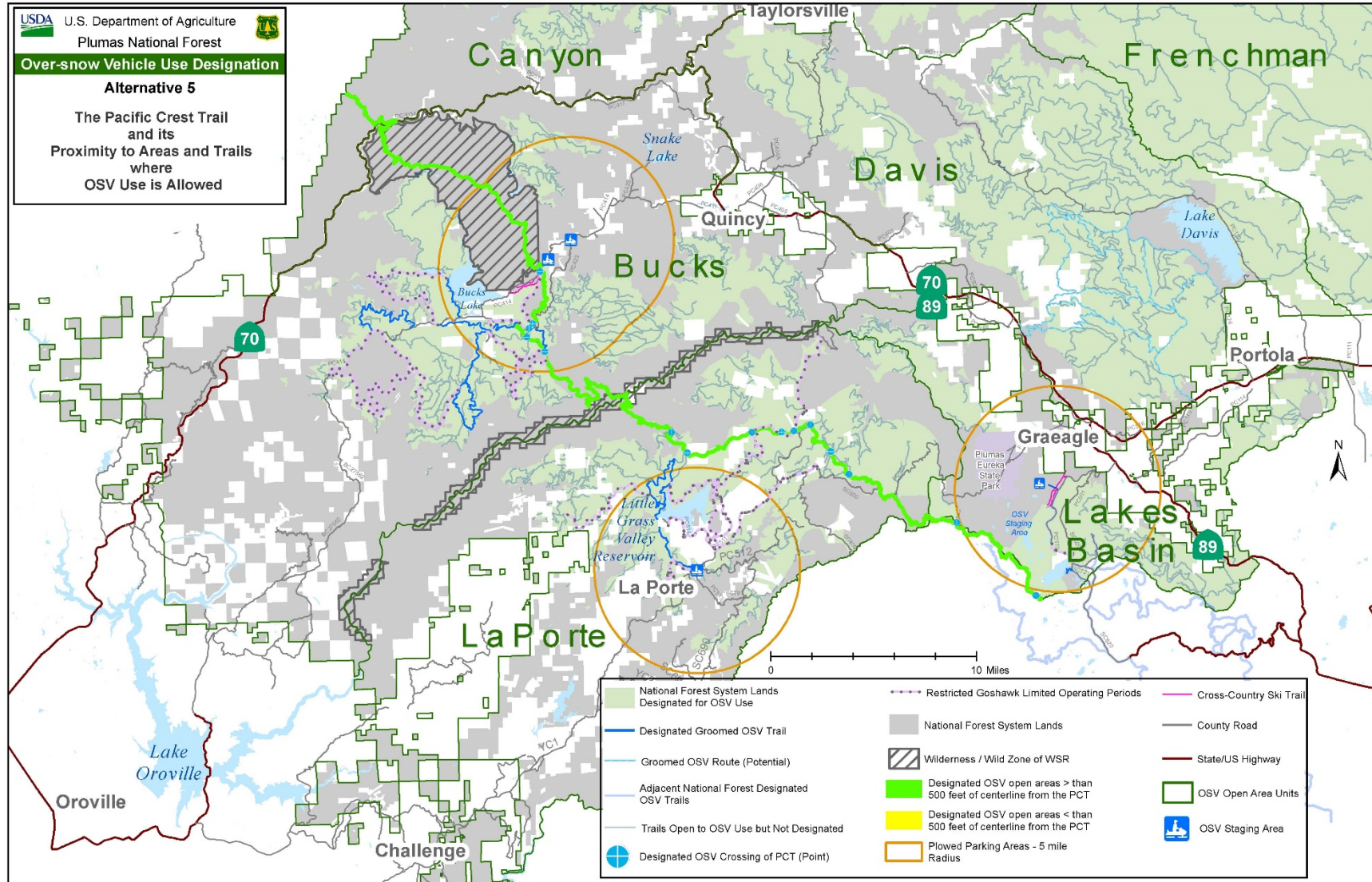


Figure 6. Pacific Crest Trail and its proximity to areas and trails where OSV use is allowed, alternative 5

approximately 7.6 miles of cross-country ski trails and 22.4 miles of the PCT within 5 miles of plowed trailheads. These areas are free from motorized use and are easily accessible by non-motorized visitors in a typical day trip. This is a 56,728-acre increase over existing conditions. This is more high-quality non-motorized opportunities than would be provided under alternatives 1, 2 and 4, but less than would be provided under alternative 3.

Issue 1c. Quality of Winter Recreational Experiences

- a) Consuming untracked powder desired by non-motorized winter recreationists, particularly backcountry downhill skiers;**
- b) Compacting, tracking, and rutting the snow, making the snow surface difficult and potentially unsafe for non-motorized users to cross-country ski, sled, snowshoe, or walk on;**
- c) Creating a real or perceived risk of injury or mortality;**

Existing areas of conflict between motorized and non-motorized winter uses (as described in Issue 1c for alternative 1) would be mitigated as described in alternative 2 - modified, and documented in the minimization criteria worksheets in volume II, appendices D and E. Alternative 5 emphasizes protections for wildlife and natural resources as well as the quality non-motorized recreation experience, with less acres designated for OSV use than all alternatives except alternative 3, and less areas of potential overlap between motorized and non-motorized uses than all alternatives, except of alternative 3. Therefore, alternative 5 reduces potential conflicts with non-motorized uses to the greatest extent than alternatives 1, 2 - modified, and 4.

- d) Creating noise which may affect solitude and quiet recreational opportunities; and**

Under alternative 5, 651,877 acres would be designated for OSV use and the associated influence of OSV noise. Noise sources of multiple OSVs and vehicles would be concentrated at plowed OSV trailheads, and more dispersed along designated trails and in designated areas (see OSV-use assumptions for analysis). Only 246,816 acres, or 37.9 percent of the 651,877 acres designated for OSV use, are anticipated to have high to moderate OSV-use levels and the associated higher potential noise impacts. Therefore alternative 5 negatively impacts solitude and quiet recreational opportunities less than alternatives 1, 2 - modified, and 4, but slightly more than alternative 3.

Ongoing motorized use near the designated non-motorized areas, such as wilderness (1,423 acres designated for OSV use within 0.25 mile of designated Wilderness), temporarily degrades opportunities for solitude near the non-motorized area boundaries, when OSVs are present on the trails. Since no use is designated within 500 feet of the PCT, noise conflict is not anticipated under alternative 5. Similarly, there may be temporary impacts to air quality in the vicinity of OSVs. OSV use within .25 miles of designated wilderness under alternative 5 would be less than in alternatives 1 and 4, slightly less than in alternative 2, but more than under alternative 3.

- e) Impacting the scenery by reducing the amount of unaltered views.**

Short-term impacts to scenery and the setting for non-motorized experiences occur when OSV tracks through the snow crisscross the landscape, leaving visual evidence of motorized use. The tracks only remain on the landscape until they are covered by additional snowfall or until the snow melts, and do not cause long-term impacts to scenery or the underlying soils and vegetation (see additional analysis in the applicable resource sections of this analysis). Potential impacts

occur primarily where motorized and non-motorized uses overlap on approximately 49,349 acres. This is less overlap than alternatives 1, 2-modified, and 4, but more than alternative 3.

Cumulative Effects – Alternative 5

The cumulative effects of alternative 5 would be similar to those described for alternative 2 - modified, although potential effects would occur across fewer acres designated for OSV use.

Table 24. Resource indicators and measures for alternative 5 direct and indirect effects

Resource Element	Resource Indicator/Measure	Alternative 5
1a. Availability of Motorized Over-snow Recreation Opportunities – Designated cross-country areas	Acreage of designated public OSV cross-country use; percent change as compared to current management	651,877 acres open to public, cross-country OSV use, 43.2 percent decrease from existing conditions. 24 or more inches of snow or ice covering the landscape, to prevent impacts to surface and subsurface.
1a. Availability of Motorized Over-snow Recreation Opportunities - Designated snow trails	Length of designated OSV trails (miles), percent change from current management	210 miles of designated OSV snow trails, subject to snow depth restrictions. 7.5 percent decrease from existing conditions. OSV use on trails would be allowed when there are 12 or more inches of snow or ice covering the trail
1a. Availability of Motorized over-snow recreation Opportunities – Designated, groomed snow trails	Length of groomed OSV trails (miles), percent change from current management	210 miles, 3.4 percent decrease from existing conditions Follow California State Parks' Off-Highway Motor Vehicle Recreation Division snow depth standards for grooming, which is currently 12 to 18 inches of snow
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Distance to non-motorized opportunities	Acreage and length of trails (miles) available to non-motorized recreation enthusiasts within 5 miles of plowed trailheads Percent of acres available for quiet, non-motorized use that are considered high-quality non-motorized opportunities based on proximity to plowed trailheads (areas within 5 miles of plowed trailheads) and absence of motorized use	Four plowed trailheads provide access for motorized and non-motorized winter use 69,685 acres available for non-motorized recreation within 5 miles of plowed trailheads, a 56,728 acre increase from existing conditions 12.6 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities 7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Conflicts with other resource values	Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.)	Potential conflict with other resource values are described in the Minimization Criteria worksheets in Appendices B and C

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Resource Element	Resource Indicator/Measure	Alternative 5
1b. Availability of Non-motorized Over-snow Recreation Opportunities - Wilderness	Size of areas (acres) affected and duration of impact. Qualitative description for wilderness attributes.	<p>Opportunities for solitude maybe temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 1,423 acres designated for OSV use within 0.25 mile of designated wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Roadless Characteristics	Size of area (acres) affected and duration of impact. Qualitative description for roadless characteristics	<p>No IRA acres designated for OSV use.</p> <p>Roadless characteristics such as air quality and primitive and semi-primitive and semi–primitive non-motorized classes of dispersed recreation would not be impacted by proposed OSV use designations</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Pacific Crest Trail	Number of crossings; area (acres) where OSV use is allowed within 500 feet of centerline of the PCT	<p>16 designated OSV crossings of the PCT (on MVUM roads or trails, the width of a road, approximately 14 feet)</p> <p>OSV use not designated within 500 feet of centerline of the PCT.</p>
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for Wild and Scenic Attributes	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Eligible Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for eligible Wild and Scenic Attributes	Approximately 7.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality motorized opportunities	Percent of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV-use assumption categories	246,816 acres high to moderate OSV use, 37.9 percent of the designated acres are considered high-quality.
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality non-motorized opportunities	Acreage not designated for public cross-country OSV use, percent change as compared to current management	552,873 acres not designated for OSV use, an 871.2 percent increase

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Resource Element	Resource Indicator/Measure	Alternative 5
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Solitude	Distance of groomed public OSV snow trails from non-motorized areas	A total of approximately 3.5 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Noise	Acres and percent of designated acres that are anticipated to have high to moderate OSV-use levels and the associated potential for noise impacts	651,877 acres designated for OSV use and potentially affected by noise; 246,816 acres (37.9 percent) of the acres designated for OSV use are expected to have high to moderate use.
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Scenery	Qualitative/narrative description of potential visual impacts	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Fewer acres designated for cross-country OSV use, and associated visual impacts than in existing conditions, alternative 2 - modified, and alternative 4. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 49,349 acres

Summary

Degree to Which the Purpose and Need for Action is Met

All of the action alternatives (alternatives 2 - modified, 3, 4, and 5) equally meet the purpose and need to effectively manage OSV use by identifying a manageable system of OSV trails and areas per Subpart C of the Travel Management Regulations and to identify OSV trails for grooming to provide a high-quality OSV trail system.

Degree to Which the Alternatives Address the Issues

Table 25 provides a comparison of the alternatives and the degree to which the alternatives address the recreation-related issues.

Table 25. Summary of resource indicators and measures for all action alternatives

Resource Element	Resource Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified	Alternative 3	Alternative 4	Alternative 5
1a. Availability of Motorized Over-snow Recreation Opportunities – Designated cross-country areas	<p>Acreage of designated public OSV cross-country use;</p> <p>Percent of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV-use assumption categories</p>	<p>1,147,825 acres currently open to public, cross-country OSV use.</p> <p>189,545 acres high to moderate OSV use</p> <p>No minimum snow depth requirement</p>	<p>858,436 acres designated for public cross-country OSV use, a 25.2 percent decrease from existing conditions.</p> <p>144,332 acres high to moderate OSV use (16.8 percent)</p> <p>12 inch snow depth requirement</p>	<p>600,542 acres designated for public cross-country OSV use, a 47.7 percent decrease from existing conditions.</p> <p>246,815 acres high to moderate OSV use (41 percent)</p> <p>18 inch snow depth requirement</p>	<p>1,160,793 acres designated for public cross-country OSV use, 1.1 percent decrease from existing conditions.</p> <p>682,877 acres high to moderate OSV use (58.8 percent)</p> <p>12 inch snow depth requirement</p>	<p>651,877 acres designated for public cross-country OSV use, a 43.2 percent decrease from existing conditions.</p> <p>246,816 acres high to moderate OSV use (37.8 percent)</p> <p>24 inch snow depth requirement</p>
1a. Availability of Motorized Over-snow Recreation Opportunities - Designated snow trails	<p>Length of designated OSV trails (miles), percent change from current management</p>	<p>227 miles of designated OSV trails (groomed and ungroomed), no change</p>	<p>226 miles of designated OSV snow trails, subject to snow depth restrictions, 44 percent decrease from existing conditions</p> <p>Adequate snow to prevent resource damage, typically 6 inch snow depth</p>	<p>220 miles of designated OSV snow trails, subject to snow depth restrictions. 3 percent decrease from existing conditions</p> <p>18 inch snow depth requirement</p>	<p>577 miles of designated OSV snow trails, subject to snow depth restrictions. 154 percent increase from existing conditions</p> <p>OSV use on trails would be allowed when there is adequate snow depth to avoid damage to natural and cultural resources</p>	<p>210 miles of designated OSV snow trails, subject to snow depth restrictions. 7.5 percent decrease from existing conditions</p> <p>12 inch snow depth requirement</p>
1a. Availability of Motorized over-snow recreation Opportunities – Designated, groomed snow trails	<p>Length of groomed OSV trails (miles), percent change from current management</p>	<p>203 miles, no change from current management</p> <p>12 inch snow depth requirement for grooming</p>	<p>143 miles, 29.5 percent decrease from current management</p> <p>12 inch snow depth requirement for grooming</p>	<p>220 miles, 8 percent increase from existing conditions</p> <p>12 inch snow depth requirement for grooming</p>	<p>577 miles, 184 percent increase from existing conditions</p> <p>No minimum snow depth requirement for grooming</p>	<p>200 miles, 1 percent decrease from existing conditions</p> <p>12 to 18 inch snow depth requirement for grooming</p>

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Resource Element	Resource Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified	Alternative 3	Alternative 4	Alternative 5
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Distance to non-motorized opportunities	<p>Acreage and length of trails (miles) available for non-motorized opportunities within 5 miles of plowed trailheads</p> <p>Percent of acres available for quiet, non-motorized use that are considered high-quality non-motorized opportunities based on proximity to plowed trailheads (areas within 5 miles of plowed trailheads) and absence of motorized use</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>12,957 acres available for non-motorized recreation within 5 miles of plowed trailheads, no change from existing conditions</p> <p>22.8 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>34,700 acres available for non-motorized recreation within 5 miles of plowed trailheads, a 21,743-acre increase from existing conditions</p> <p>10 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>71,146 acres available for non-motorized recreation within 5 miles of plowed trailheads, a 58,189-acre increase from existing conditions.</p> <p>11.9 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>12,957 acres available for non-motorized recreation within 5 miles of plowed trailheads, no change from existing conditions</p> <p>29.5 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>	<p>Four plowed trailheads provide access for motorized and non-motorized winter use</p> <p>69,685 acres available for non-motorized recreation within 5 miles of plowed trailheads, a 56,728-acre increase from existing conditions</p> <p>12.6 percent of acres available for quiet, non-motorized use are considered high-quality non-motorized opportunities</p> <p>7.6 miles of cross-country ski trails and 22.4 miles of the PCT available for non-motorized recreation within 5 miles of plowed trailheads</p>

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Resource Element	Resource Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified	Alternative 3	Alternative 4	Alternative 5
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Conflicts with other resource values	Proximity of OSV use related to other resource values (such as tribal/spiritual sites, sensitive wildlife areas, popular non-motorized winter recreation areas, populated areas, neighboring Federal lands, etc.)	Potential conflicts with other resource values are described in the Minimization Criteria worksheets in Volume II, Appendices D and E	Potential conflicts with other resource values are described in the Minimization Criteria worksheets in Appendices D and E	Potential conflicts with other resource values are described in the Minimization Criteria worksheets in Appendices D and E	Potential conflicts with other resource values are described in the Minimization Criteria worksheets in Appendices D and E	Potential conflicts with other resource values are described in the Minimization Criteria worksheets in Appendices D and E
1b. Availability of Non-motorized Over-snow Recreation Opportunities - Wilderness	Size of areas (acres) affected and duration of impact. Qualitative description for wilderness attributes.	<p>Opportunities for solitude may be temporarily affected due to the sights and sounds of OSVs near wilderness boundaries.</p> <p>There are approximately 4,646 acres currently open to OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>	<p>Opportunities for solitude may be temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 1,940 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>	<p>Opportunities for solitude may be temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 225 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>	<p>Opportunities for solitude may be temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 4,646 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>	<p>Opportunities for solitude may be temporarily affected due to the sights and sounds of OSVs near Wilderness boundaries.</p> <p>There are approximately 1,423 acres designated for OSV use within 0.25 mile of designated Wilderness boundaries, The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.</p>

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1b. Availability of Non-motorized Over-snow Recreation Opportunities – Roadless Characteristics	Size of area (acres) affected and duration of impact. Qualitative description for roadless characteristics	Approximately 64,604 IRA acres currently open to OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.	Approximately 7,164 IRA acres designated for OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area.	Approximately 8,348 IRA acres designated for OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area	Approximately 64,613 IRA acres designated for OSV use. Air quality, and primitive and semi-primitive non-motorized classes of dispersed recreation may be temporarily affected due to the presence of OSVs. The duration of the potential impacts would be short-term, during the winter while snow depth is adequate for OSVs to access the area	No IRA acres designated for OSV use. Roadless characteristics such as air quality and primitive and semi-primitive and semi – primitive non-motorized classes of dispersed recreation would not be impacted by proposed OSV-use designations

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1b. Availability of Non-motorized Over-snow Recreation Opportunities – Pacific Crest Trail	Number of crossings; area (acres) where OSV use is allowed within 500 feet of centerline of the PCT	<p>No designated OSV crossings of the PCT.</p> <p>OSV use allowed within 500 feet of centerline of the PCT on 5,294 acres of the PCT</p>	<p>16 designated OSV crossings of the PCT (10 on MVJM routes, 2 on Country roads that are on the MVJM as background data and 4 crossing zones up to 0.25 mile wide)</p> <p>Non-motorized zone adjacent to the PCT at Bucks Summit, the eastern side of the Middle Fork Wild and Scenic River, and from the general area of Onion Valley to McRae Ridge.</p> <p>OSV use designated within 500 feet of centerline of the PCT on 1,717 acres of the PCT</p>	<p>9 designated OSV crossings of the PCT (8 on MVJM roads and 1 on a motorized trail)</p> <p>OSV use designated within 500 feet of centerline of the PCT on 1,186 acres of the PCT</p>	<p>31 designated OSV crossings of the PCT (25 MVJM roads and 6 linear features that would be wider than a road)</p> <p>OSV use designated within 500 feet of centerline of the PCT on 5,294 acres of the PCT</p>	<p>16 designated OSV crossings of the PCT (on MVJM roads or trails, the width of a road, approximately 14 feet)</p> <p>OSV use not designated within 500 feet of centerline of the PCT.</p>

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Resource Element	Resource Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified	Alternative 3	Alternative 4	Alternative 5
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for Wild and Scenic Attributes	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings.	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings	10,813 acres where OSV use is prohibited within 0.25 mile of wild segments of Wild and Scenic Rivers, in compliance with Rx-2 Wild and Scenic River Prescription in the Plumas Forest Plan to maintain the area's outstanding values and primitive recreation settings
1b. Availability of Non-motorized Over-snow Recreation Opportunities – Eligible Wild and Scenic Rivers	Size of area (acres) affected and duration of impact. Qualitative description for eligible Wild and Scenic Attributes	Approximately 43.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings	Approximately 13.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings	Approximately 5.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings	Approximately 43.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings	Approximately 7.5 miles of Eligible Wild river segments where OSV use is allowed adjacent to the river. Potential impacts to the area's outstanding values and primitive recreation settings
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality motorized opportunities	Percent of designated acres that are considered high-quality OSV opportunities based on the high to moderate OSV-use assumption categories	16.5 percent of the designated acres are considered high-quality	16.8 percent of the designated acres are considered high-quality	41 percent of the designated acres are considered high-quality	58.8 percent of the designated acres are considered high-quality	37.9 percent of the designated acres are considered high-quality

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Resource Element	Resource Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified	Alternative 3	Alternative 4	Alternative 5
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – High quality non-motorized opportunities	Acreage not designated for public cross-country OSV use, percent change as compared to current management	56,925 acres, OSV use not allowed.	346,314 acres not designated for OSV use, a 508 percent increase	604,208 acres not designated for OSV use, a 961 percent increase	43,957 acres not designated for OSV use, a 22.8 percent decrease	552,873 acres not designated for OSV use, a 871.2 percent increase
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Solitude	Distance of groomed public OSV snow trails from non-motorized areas	A total of approximately 5 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary	A total of approximately 7 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary	A total of approximately 3.5 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary	A total of approximately 5 miles of groomed OSV trails plus approximately 3 miles of potential groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary	A total of approximately 3.5 miles of groomed OSV trails within 0.5 mile of Bucks Lake Wilderness boundary
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Noise	Acres and percent of designated acres that are anticipated to have high to moderate OSV-use levels and the associated potential for noise impacts	1,147,825 acres currently open to OSV use and potentially affected by noise; 189,545 acres (16.5 percent) of the acres open to OSV use are expected to have high to moderate use.	858,436 acres designated for OSV use and potentially affected by noise; 144,332 acres (16.8 percent) of the acres designated for OSV use are expected to have high to moderate use.	600,542 acres designated for OSV use and potentially affected by noise; 246,815 acres (41 percent) of the acres designated for OSV use are expected to have high to moderate use.	1,160,793 acres designated for OSV use and potentially affected by noise; 682,877 acres (58.8 percent) of the acres designated for OSV use are expected to have high to moderate use.	651,877 acres designated for OSV use and potentially affected by noise; 246,816 acres (37.9 percent) of the acres designated for OSV use are expected to have high to moderate use.

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Resource Element	Resource Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified	Alternative 3	Alternative 4	Alternative 5
1c. Quality of Motorized and Non-motorized Over-snow Recreation Experiences – Scenery	Qualitative/narrative description of potential visual impacts	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 106,252 acres	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Fewer acres designated for cross-country OSV use, and associated visual impacts than in existing conditions and alternative 4. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 84,350 acres	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Fewer acres designated for cross-country OSV use, and associated visual impacts than all other alternatives. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 47,172 acres	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Slightly more acres designated for cross-country OSV use, and associated visual impacts than in existing conditions. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 106,282 acres	Cross-country OSV use creates temporary tracks in the snow that crisscross the landscape. Fewer acres designated for cross-country OSV use, and associated visual impacts than in existing conditions, alternatives 2 - modified, and 4. The visual evidence of snowmobile use decreases as fresh snow covers the tracks and/or when the snow melts at the end of the season. Potential impacts occur primarily where motorized and non-motorized uses overlap, on approximately 49,349 acres

Air Quality

Air quality is a key resource and a valued element of the forest experience. This analysis describes air quality in the Plumas National Forest and evaluates the potential changes and effects of the alternatives on air quality.

Topics and Issues Addressed in This Analysis

Issues

The NEPA regulations at 40 CFR § 1501.7 state “identify and eliminate from detailed study the issues which are not significant.”

Internal and external scoping identified the following significant issue (issue 2) with regard to air quality.

Designating areas and trails for public OSV use and grooming trails for public OSV use have the potential to generate exhaust and emit pollutants into the air. This has the potential to degrade the quality of the air. This potential degradation of air quality can impact recreational users, wildlife, and sensitive areas.

- Monitoring of ambient air quality near trails, trailheads, and in OSV areas.

The monitoring of ambient air quality and noise is outside the scope of the purpose and need for action. The Forest Service has no regulatory jurisdiction over air quality. There are no standards which would allow the Forest Service to identify or enforce prohibitions against unacceptable air quality levels. These levels are set by state law and therefore will not be analyzed in detail. Effects on air quality from the proposed action and alternatives, including the indirect effects of changes in air quality will be discussed in this section.

- Transition to cleaner and quieter OSVs through encouragement of best available technology (BAT) to reduce air and noise pollution.

The imposition of best available technology requirements is outside the scope of the purpose and need for action, which is to provide a manageable, designated OSV system of areas and trails for public use within the Plumas National Forest that is consistent with and achieves the purposes of the Forest Service Travel Management Rule at 36 CFR Part 212, subpart C. The regulation of best available technology, whether only encouraged or mandated, is outside the scope of this analysis (FEIS 2019). The Forest Service has no regulatory jurisdiction over air quality and there are no Forest Service directives requiring the establishment of standards, therefore, this will not be analyzed in detail.

Resource Indicators and Measures

The air quality analysis is a qualitative discussion of the potential contribution of OSV emissions from the estimated number of visitors to the Plumas each year.

Information Sources

Information sources used for this analysis are listed below and represent some of best available information that was available at the time of analysis.

- ArcMap and relevant Geographic Information System (GIS) data layers from the Plumas National Forest, Environmental Protection Agency and the California Air Resources Board were used. Including county boundaries, air basin boundaries, air district boundaries and class 1 and 2 areas.

- GIS layer of proposed OSV designations and groomed trails
- Plumas National Forest Plan (USDA Forest Service 1988).
- Scientific literature cited in the “References” section.
- The National Visitor Use Monitoring (NVUM) information for the Plumas National Forest.
- OSV use was from the 2009 OSV Winter Trailhead Survey conducted in support of the 2010 State OSV Program Environmental Impact Report (EIR) for Program Years 2010-2020.

Incomplete and Unavailable Information

No information was found on past monitoring of air quality related to OSV use in the forest.

Assumptions used in the Analysis

For analysis purposes, snowmobile emission data used was obtained from the Environmental Protection Agency (EPA 2010). Analysis was based on emission estimates for a 2-stroke snowmobile (worst-case scenario). Snowmobile miles traveled per day was estimated at 50 miles per day and was averaged based on the responses received through a survey forum (snowest.com). The CA State Parks estimate of 22,250 visitors forestwide per winter season is similar to the 2005 NVUM data. The 2010 and 2015 NVUM data shows very little OSV use (Valentine 2018b). OSV use is reported highest on weekends and holidays.

Spatial and Temporal Context for Effects Analysis

Spatial Context:

- The spatial boundary for analyzing the direct and indirect effects to air quality is the national forest administrative boundary, because the decision would apply to OSV use in the forest.
- The spatial boundaries for analyzing cumulative effects to air quality is the national forest administrative boundary, because the decision would apply to OSV use and the potential to cumulatively impact air quality in the forest.

Effects Timeframe:

The temporal boundary for analyzing the direct and indirect effects to air quality is one OSV season. This is in order to analyze the estimated OSV emissions within the Plumas National Forest for one winter season, as compared to the total emissions generated in relevant air districts per year.

Affected Environment

California is divided geographically into air basins for the purpose of managing the air resources of the State on a regional basis. An air basin generally has similar meteorological and geographic conditions throughout. The State is currently divided into fifteen air basins. The majority of the Plumas National Forest is located within the Mountain Counties air basin; with a portion of the forest within the Sacramento Valley and Northeast Plateau Air Basins (figure 7).



Figure 7. Designated air basins in California

Class I and II Areas

The following Class I areas are located around the Plumas National Forest: The Caribou Wilderness lies approximately 15 miles to the north; the Lassen Volcanic National Park is approximately 17 miles to the north; the Desolation Wilderness is approximately 50 miles to the south, and the Yolla-Bolly-Middle Eel Wilderness is approximately 65 miles to the west.

The Clean Air Act as amended in August 1977, was developed for the preservation of air quality. Section 160-169 of the Act established a detailed policy and regulatory program to protect the quality of the air in regions of the United States in which the air is cleaner than required by the NAAQS. One purpose of the program is the Prevention of Significant Deterioration (PSD) and to preserve, protect and enhance air quality in national parks and national wilderness areas. Under PSD provisions, Congress established a land classification scheme for those areas with air quality better than the NAAQS. Class I allows very little

deterioration of air quality, Class II allows moderate deterioration, and Class III allows more deteriorations. In all cases, the pollution concentrations shall not violate NAAQS.

Visibility impairment is defined as any humanly perceptible change in visual air quality from that which would have existed under natural conditions (in other words, absent human-caused influence). This change is caused by air pollutants: particles and gases in the atmosphere which either scatter or absorb light. The net effect is the creation of a hazy condition. Sources for visibility impairment in these Class I areas include, but are not limited to, industrial sources, on-road and off-road vehicle emissions, road dust, windblown dust, and smoke. Sources can be local or very distant. Progress towards better visibility is calculated from data collected at the Interagency Monitoring of Protected Visual Environments (IMPROVE) network. IMPROVE was initially established as a national visibility network in 1985, and consisted of 30 monitoring sites primarily located in national parks, 20 of which began operation in 1987. With the implementation of the Regional Haze Rule (RHR) in 1999, the IMPROVE network expanded, and 110 monitoring sites were identified that were deemed representative of the regional haze conditions for 155 of the mandatory 156 Class I areas, the Bering Sea Wilderness being the exception. In addition to the 110 sites that are used to represent Class I areas, a number of IMPROVE protocol sites are in operation that provide expanded spatial coverage for the network. The IMPROVE monitors measure the concentration of each haze-causing pollutant every three days (<http://vista.cira.colostate.edu/Improve/improve-program/>). There are 17 IMPROVE monitors representing one or more of the Class I Areas in California. The BLIS1 monitor location represents two wilderness areas located along the crest of the Sierra Nevada mountain range, just west of Lake Tahoe. The wilderness areas associated with the BLIS1 monitor are Desolation Wilderness area and Mokelumne Wilderness area (within the Stanislaus, Eldorado and Toiyabe National Forests). The BLIS1 site has been operating since November 1990 (ARB 2016). The Lassen Volcanic National Park IMPROVE Monitor is located north west of the Plumas National Forest (EPA 2018).

The Air Resources Board also noted that California determines the current Regional Haze plan strategies are sufficient for California and its neighboring states to meet their 2018 Reasonable Progress Goals. This is evidenced by reductions in human-caused source emissions in California and the concurrent improvement in visibility at all of California's Class I Area IMPROVE monitors (ARB 2014).

Air Quality Standards

The Plumas National Forest must comply with Federal and State ambient air quality standards as mandated by the Clean Air Act of 1963. These standards have been established for seven criteria air pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), PM₁₀, PM_{2.5}, ozone (O₃), and sulfur dioxide (SO₂). California also has standards in place for sulfates, hydrogen sulfide, visibility reducing particles and vinyl chloride (ARB 2015).

These pollutants can affect human health, reduce visibility, and lead to acidic deposition in sensitive, high-elevation lakes. Air quality within the National Forest is potentially affected by land management and development activities both on and off the forest. Sources of air pollutants include forest management activities such as wildland fires (both natural and management ignited), road dust, and vehicle emissions. These sources, as well as industrial sources and emissions from urban developments (gas stations, restaurants, railroads, and wood burning stoves) are also found outside Forest Service administered lands.

Currently, the Plumas National Forest complies with Federal and state standards and there are no known violations of the Clean Air Act. The city of Chico, California in Butte County is in non-attainment for 8-hour ozone and PM_{2.5}. The other criteria pollutants for the counties/air districts associated with the Plumas National Forest are in attainment or unclassified. The concern for ozone is in the summer only according to the Air Pollution Specialist at the Air Resources Board (Lopina 2015) (figure 8 and table 26 and table 27).



Figure 8. Class I areas in California

Table 26. Federal non-attainment areas for criteria pollutants

County and/or Air District	8 hour Ozone	Carbon Monoxide (CO)	Lead (Pb)	Particulate Matter 2.5 (PM _{2.5})	Particulate Matter 10 (PM ₁₀)	Nitrogen Dioxide (NO ₂)	Sulfur Dioxide (SO ₂)
Butte	<i>N (for Chico, Ca)</i>	<i>U/A</i>	<i>U/A</i>	<i>N (for Chico, Ca)</i>	<i>U</i>	<i>U/A</i>	<i>U</i>
Lassen	<i>U</i>	<i>U/A</i>	<i>U/A</i>	<i>U</i>	<i>U</i>	<i>U/A</i>	<i>U</i>
Plumas	<i>U</i>	<i>U/A</i>	<i>U/A</i>	<i>U</i>	<i>U</i>	<i>U/A</i>	<i>U</i>
Sierra	<i>U</i>	<i>U/A</i>	<i>U/A</i>	<i>U</i>	<i>U</i>	<i>U/A</i>	<i>U</i>
Yuba	<i>U</i>	<i>U/A</i>	<i>U/A</i>	<i>U</i>	<i>U</i>	<i>U/A</i>	<i>U</i>

Source: <http://www.arb.ca.gov/ei/gislib/gislib.htm> (Accessed: June 2018). **A=Attainment, U=Unclassified, N=Non-attainment**

Table 27 shows the California Ambient Air Quality Standards (CAAQS) state designations for all criteria pollutants in California. The Air Resources Board makes State area designations for 10 criteria pollutants: ozone, suspended particulate matter (PM₁₀), fine suspended particulate matter (PM_{2.5}), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles (ARB 2015). The Air Resources Board lists all counties in non-attainment for PM₁₀. Additionally, Butte County is in non-attainment for PM_{2.5} and Ozone; Plumas County is in non-attainment for PM_{2.5} at the south central area of the county and the Plumas National Forest; and Yuba County is listed as non-attainment/transitional for Ozone. The remaining counties are in attainment or unclassified for the criteria pollutants.

Table 27. State designated non-attainment areas for criteria pollutants

County and/ or Air District	Ozone (O ₃)	Carbon Monoxide (CO)	Lead (Pb)	PM _{2.5}	PM ₁₀	Nitrogen Dioxide (NO ₂)	Sulfur Dioxide (SO ₂)	Sulfates	Hydrogen Sulfide	Visibility Reducing Particles
Butte	<i>N</i>	<i>A</i>	<i>A</i>	<i>N</i>	<i>N</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>U</i>	<i>U</i>
Lassen	<i>A</i>	<i>U</i>	<i>A</i>	<i>A</i>	<i>N</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>U</i>	<i>U</i>
Plumas	<i>U</i>	<i>A</i>	<i>A</i>	<i>U/N (South central portion of county and forest is "N")</i>	<i>N</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>U</i>	<i>U</i>
Sierra	<i>U</i>	<i>U</i>	<i>A</i>	<i>U</i>	<i>N</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>U</i>	<i>U</i>
Yuba	<i>N-T</i>	<i>U</i>	<i>A</i>	<i>A</i>	<i>N</i>	<i>A</i>	<i>A</i>	<i>A</i>	<i>U</i>	<i>U</i>

Source: <http://www.arb.ca.gov/ei/gislib/gislib.htm> Accessed: June 2018. **A=Attainment, U=Unclassified, N=Non-attainment, N-T=Non-attainment/Transitional**⁴.

⁴ **Section 185A (Previously called Transitional)**

An area designated as an ozone nonattainment area as of the date of enactment of the Clean Air Act Amendments of 1990 has not violated the national primary ambient air quality standard for Ozone for the 36-month period commencing on January 1, 1987, and ending on December 31, 1989. Twelve areas were classified transitional in 1991. (EPA.gov) <https://www.epa.gov/green-book/ozone-designation-and-classification-information>

Table 28 displays the estimated annual average emissions (tons per year) generated for the air districts and counties within the Plumas National Forest (EPA 2013).

Table 28. Estimated annual average emissions (tons per year) by air district for area wide, stationary, and mobile sources

Air District	TOG	ROG	CO	NOx	SOx	PM	PM ₁₀	PM _{2.5}
Butte	9,380.5	6,212.3	30,389.9	6,643	109.5	10,793.05	6,270.7	2,171.75
Lassen	6,288.95	2,197.3	12,884.5	1,766.6	94.9	5,880.15	3,777.75	1,153.4
Northern Sierra AQMD (Plumas, Sierra and Nevada Counties*)	10,577.7	5,131.9	33,572.7	4,796.1	270.1	12,380.8	7,577.4	1,941.8
Feather River AQMD (Yuba County)	11,453.7	5,500.55	19,520.2	7,307.3	204.4	10,318.55	5,653.85	1,843.25

Source: <http://www.arb.ca.gov/ei/maps/statemap/dismap.htm> Accessed June 2018.

*Emission data listed for the Northern Sierra AQMD also includes Nevada County which is not within the Plumas National Forest.

Greenhouse Gases and Climate Change

Greenhouse gases trap heat and make the planet warmer. Human activities are responsible for almost all of the increase in greenhouse gases in the atmosphere over the last 150 years. The largest source of greenhouse gas emissions from human activities in the United States is from burning fossil fuels for electricity, heat, and transportation. The transportation sector made up 27 percent of the 2015 greenhouse gas emissions.

Greenhouse gas emissions from transportation primarily come from burning fossil fuel for our cars, trucks, ships, trains, and planes. Almost all (95 percent) of the world's transportation energy comes from petroleum-based fuels, largely gasoline and diesel. Fossil fuel use is the primary source of CO₂ (carbon dioxide). CO₂ can also be emitted from direct human-induced impacts on forestry and other land use, such as through deforestation, land clearing for agriculture, and degradation of soils. Likewise, land can also remove CO₂ from the atmosphere through reforestation, improvement of soils, and other activities.

Global carbon emissions from fossil fuels have significantly increased since 1900. Since 1970, CO₂ emissions have increased by about 90 percent, with emissions from fossil fuel combustion and industrial processes contributing about 78 percent of the total greenhouse gas emissions increase from 1970 to 2011. Agriculture, deforestation, and other land-use changes have been the second-largest contributors (Edenhofer et al. 2014). In 2001, the EPA estimated the percentage contributions made by snowmobiles to the overall output in the United States to be: hydrocarbons (HC) 1.2 percent, carbon dioxide (CO) 0.5 percent, nitrogen oxides (NOx) 0.007 percent, and particulate matter (PM) 0.07 percent. This is truly a tiny contribution to the total emissions released in a year, but snowmobile engines were lumped in with many off-road engine types and standards were established for them all (Snow Goer 2006).

Snowmobile Emission Standards

The effect of emissions from snowmobile activity on air quality and deposition in high elevation ecosystems has been studied primarily at Yellowstone National Park in North West Wyoming. They emit hydrocarbons (HC), nitrogen oxides (NOx), particulate matter (PM), carbon monoxide (CO), and non-combusted fuel vapors (USDI NPS 2000). Combustion engine emissions contain carcinogens, including benzene, butadiene, and polycyclic aromatic hydrocarbons (USDI NPS 2000). Combustion engines also emit large amounts of carbon monoxide.

In the case of snowmobiles, the EPA measures and regulates only HC and CO levels in the exhaust. Levels of NOx are inherently low in two-stroke engines because of their lower combustion chamber temperatures.

While four-stroke engines will have higher NO_x emissions, they are not of great concern in the winter when temperatures aren't high enough to act as the catalyst to create smog (Snow Goer 2006).

In 2002, EPA issued a regulation that imposed stringent pollution regulations on snowmobiles, requiring that snowmobiles fall under regulations of the Clean Air Act (Jehl 2002). In 2012, snowmobile manufacturers were required to meet one of two alternatives. One would require reductions in emissions of both hydrocarbons and carbon monoxide by 50 percent from current levels. The other is intended to encourage further reductions in hydrocarbons and would require a 70 percent reduction in hydrocarbons, the source of the more urgent health concerns, in return for a 30 percent reduction in carbon monoxide (Jehl 2002). The result is that snowmobile engines now have significant lower emissions and are much cleaner. EPA regulations target model year 2006 or newer snowmobiles (Raap 2014).

EPA also requires that manufacturers ensure each new engine, vehicle, or equipment meets the latest emission standards. Once manufacturers sell a certified product, no further effort is required to complete certification. If products were built before EPA emission standards started to apply, they are generally not affected by the standards or other regulatory requirements (EPA 2015a).

According to the California Vehicle code, Division 16.5, Chapter 6, OHVs include snowmobiles. They must have anti-emission devices for air quality and any modification to a machine that removes this device is subject to citation. All vehicles must be registered and are subject to inspection by law enforcement (OHV personnel), so failure to register is also a citable offense. Most machines are 20 years or less in age, so that means, they have newer technology and due to the NPS BATs, the machines are quieter and emit less pollution (Schoenberg 2018).

Table 29. Exhaust emission standards for snowmobiles

Phase	Model year	Phase-in (percent)	Emission standards HC	Emission standards CO	Maximum allowable family emission limits HC	Maximum allowable family emission limits CO
Phase 1	2006	50	100	275	-	-
Phase 1	2007-2009	100	100	275	-	-
Phase 2	2010 and 2011	100	75	275	-	-
Phase 3	2012 and later	100	(¹)	(¹)	150	400

Source: Code of Federal Regulations, Accessed November 2015 ⁵

⁵ See § 1051.103(a)(2):

(a) ***

(1) Follow table 1 of this section for exhaust emission standards. You may generate or use emission credits under the averaging, banking, and trading (ABT) program for HC and CO emissions, as described in subpart H of this part. This requires that you specify a family emission limit for each pollutant you include in the ABT program for each engine family. These family emission limits serve as the emission standards for the engine family with respect to all required testing instead of the standards specified in this section. An engine family meets emission standards even if its family emission limit is higher than the standard, as long as you show that the whole averaging set of applicable engine families meets the applicable emission standards using emission credits, and the vehicles within the family meet the family emission limit. The phase-in values specify the percentage of your U.S.-directed production that must comply with the emission standards for those model years. Calculate this compliance percentage based on a simple count of your U.S.-directed production units within each certified engine family compared with a simple count of your total U.S.-directed production units. Table 1 also shows the maximum value you may specify for a family emission limit, as follows:

(2) For Phase 3, the HC and CO standards are defined by a functional relationship. Choose your corporate average HC and CO standards for each year according to the following criteria: <https://www.federalregister.gov/articles/2008/06/25/E8-14411/exhaust-emission-standards-for-2012-and-later-model-year-snowmobiles>

Best Available Technology (BAT)

Snowmobiles must be certified by the National Park Service to enter some national parks (Yellowstone, Grand Teton). BAT certification is one of the most stringent standards for air and noise emissions in the world, requiring hydrocarbon emissions of less than 15 g/kW-hr, carbon monoxide emissions of less than 120 g/kW-hr, and sound level limited to 73 decibels (BRP 2011). The use of BAT snowmobiles, which result in lower carbon monoxide and hydrocarbon emissions (USDI 2013), is not currently required in the forest.

Motorized Winter Recreation

Snowmobile registrations in the Plumas National Forest counties and statewide have remained nearly stable, or declined slightly over the past six years.

The State Environmental Impact Report (EIR) estimated that OSV use would continue to increase at a rate of approximately 4 percent per year, as it had between 1997 and 2009 (California Department of Park and Recreation 2010). OSV visitor use varies based on the amount of snowfall and the length of the season (Valentine 2018b).

Table 30 is derived from the OSV trailhead survey conducted for the State EIR, based on data summarized in the State EIR (California Department of Park and Recreation 2010). The table shows the average number of vehicles at trailheads, and the average number of OSVs that would be expected on weekends and holidays versus weekdays. Based on this information, estimated use per winter season is 22,250 OSV recreationists forestwide. Due to the Forest's location near large metropolitan areas, visitor use and demand for a variety of

(2) For Phase 3, the HC and CO standards are defined by a functional relationship. Choose your corporate average HC and CO standards for each year according to the following criteria:

(i) Prior to production, select the HC standard and CO standard (specified as g/kW-hr) so that the combined percent reduction from baseline emission levels is greater than or equal to 100 percent; that is, that the standards comply with the following equation:

(ii) Your corporate average HC standard may not be higher than 75 g/kW-hr.

(iii) Your corporate average CO standard may not be higher than 275 g/kW-hr.

(iv) You may use the [averaging](#) and [banking](#) provisions of [subpart H](#) of this part to show compliance with these HC and CO standards at the end of the [model year](#) under [paragraph \(a\)\(2\)\(i\)](#) of this section. You must comply with these final corporate average emission standards.

(b) The exhaust [emission standards](#) in this section apply for [snowmobiles](#) using the [fuel type](#) on which they are designed to operate. You must meet the numerical [emission standards](#) for [hydrocarbons](#) in this section based on the following types of [hydrocarbon](#) emissions for [snowmobiles](#) powered by the following fuels:

(1) Natural gas-fueled snowmobiles: NMHC emissions.

(2) [Alcohol-fueled](#) snowmobiles: THCE emissions.

(3) Other snowmobiles: THC emissions.

(c) Your [snowmobiles](#) must meet [emission standards](#) over their full [useful life](#). The minimum [useful life](#) is 8,000 kilometers, 400 hours of engine [operation](#), or five calendar years, whichever comes first. You must specify a longer [useful life](#) in terms of kilometers and hours for the engine family if the average service life of your vehicles is longer than the minimum value, as follows:

(1) Except as allowed by [paragraph \(c\)\(2\)](#) of this section, your [useful life](#) (in kilometers and hours) may not be less than either of the following:

(i) Your [projected](#) operating life from advertisements or other marketing materials for any vehicles in the engine family.

(ii) Your basic mechanical warranty for any engines in the engine family.

(2) Your [useful life](#) may be based on the average service life of vehicles in the engine family if you show that the average service life is less than the [useful life](#) required by [paragraph \(c\)\(1\)](#) of this section, but more than the minimum [useful life](#) (8,000 kilometers or 400 hours of engine operation). In determining the actual average service life of vehicles in an engine family, we will consider all [available information](#) and analyses. Survey data is allowed but not required to make this showing.

[67 FR 68347, Nov. 8, 2002, as amended at 70 FR 40487, July 13, 2005; 73 FR 35951, June 25, 2008; 73 FR 59246, Oct. 8, 2008]

yearlong recreation opportunities is high; however, OSV visitor use varies based on the amount of snowfall and the length of the season (Valentine 2018b).

Table 30. Plumas National Forest OSV visitor use

Location	Day description	Number of vehicles	Number of OSVs*
Forestwide	Weekend or holiday (approx. 33 per season)	280	560
Forestwide	Weekday (approx. 65 per season)	29	58

Based on 2010 data from California State Draft EIR

*assumes an average of 2 OSVs per vehicle parked at a trailhead

*seasonal total is 22,250 is from the State DEIR page 2-21, Table 2-8. Assumes 33 weekend/holiday at observed maximum day and 65 weekdays at 20% capacity.

Source: Valentine 2018

Grooming activities

Snowcats are used for grooming OSV trails and grooming operations are typically conducted during the night or during low-use timeframes. 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 to satisfy CARB requirements. Due to the CARB requirement, grooming activities were not discussed in this analysis.

Environmental Consequences

Environmental Effects – All Alternatives

It is expected the levels of pollutants for the alternatives discussed below would fall within the ranges under current management and no violation of state or Federal ambient air quality standards would occur during the OSV season. Class I areas are not designated for OSV use in all alternatives and it is anticipated the potential impacts of OSV use in Class I areas would be fairly similar for all alternatives.

Alternative 1 – No Action

Direct and Indirect Effects - Alternative 1

Air quality in the Plumas National Forest is potentially affected by land management and development activities on and off the forest. Air pollution sources include emissions from mobile and stationary sources including industrial activity, highway vehicles, and off-road vehicles (all-terrain vehicles, aircraft, locomotives, construction machinery). Dust and burning can also significantly impact air quality as they occur on and off the forest. These sources can emit a host of regulated pollutants in and around the Plumas.

There are three factors, largely beyond State control, that can interfere with air quality in Class 1 Areas: wildfire smoke, offshore shipping emissions, and Asian dust. These factors are either from natural sources (wildfire smoke), uncontrollable sources (shipping emissions beyond California's jurisdiction), or both (Asian dust, a combination of human-caused and natural sources beyond California's control) (ARB 2014). Table 31 displays the potential contribution of snowmobile emissions from the estimated 22,250 OSV visitors that recreate in the Plumas National Forest each year under current management. All calculations were done using emission estimates from a 2-stroke snowmobile (EPA 2010). As shown in table 28, it is

estimated emissions from OSV use in the Plumas contribute less than 1 percent of carbon monoxide (CO), nitrogen oxide (NOx), and particulate matter (PM).

Table 31. Emission estimate (tons per year) for OSV use in the Plumas National Forest

Source	Number of OSVs	Miles*	CO	NOx	PM
Snowmobile (2-stroke)	22,250	50	362.99	1.05	3.31
Percent Pollutant Contribution to Air Districts	-----	----	0.0037	0.000051	0.0049

*Assumes 22,250 OSVs recreate in the forest per year and travel an average of 50 miles.

Alternative 2 – Modified Proposed Action

Direct and Indirect Effects - Alternative 2 - Modified

Emissions generated as a result of current OSV use in the Plumas are estimated to contribute less than 1 percent of carbon monoxide (CO), nitrogen oxide (NOx), and particulate matter (PM) to the air districts within the Plumas National Forest (figure 7). These emissions are minor compared to other sources of air pollution impacting the forest. Impacts to air quality include vehicle emissions such as nitrogen oxides, particulate matter and carbon monoxide from all motorized vehicles including snowmobiles and snowcats. Diesel engines also emit sulfur oxides and particulates. Air quality impacts from vehicle emissions are influenced by the effectiveness of the smog control devices on cars, amount of traffic, and the duration of engine idling. As people recreate in the forest during the winter months the effects of vehicle exhaust on air quality may become a localized temporary issue where concentrated motorized use conflicts with non-motorized uses and nuisance smell occurs.

There can be localized air quality impacts where there are a large number of snowmobiles occupying a parking lot as studied at Yellowstone National Park. The number of anticipated recreationists for this assessment is lower than Yellowstone National Park, which records 75,000 snowmobile visitors each winter (Millner 2015). The issue of snowmobile emissions and air quality was studied more intensely in Yellowstone National Park than anywhere else in the world during the early 2000s. Intensive studies confirmed that, despite high levels of unregulated snowmobile use, National Ambient Air Quality Standards (NAAQS) were never close to being exceeded in Yellowstone National Park due to snowmobile use. NAAQS thresholds have also never been exceeded elsewhere due to snowmobile use (Raap 2014).

The estimated 22,250 OSV visitors forestwide for the winter season would equate to approximately 227 OSV visitors in the forest per day (using 33 weekend/holidays and 65 weekdays per season) utilizing approximately 226 miles of trail and 858,436 acres for OSV use. That is equivalent to approximately one OSV visitor per 38 acres. It is expected OSV emissions would dissipate and the possibility of accumulation would be eliminated based on topographic influences and wind dispersion. Non-motorized recreationist air quality concerns in parking lots, at trailheads and on trails would continue since non-motorized and motorized recreationists would still share the same parking areas, trailheads and many of the same trails. The odor generated by emissions from combustion engines, particularly two-cycle engines, can diminish a non-motorized recreationist experience. However, this is likely a recreationist satisfaction issue rather than a general air quality issue (see recreation analysis for more discussion on the topic of visitor experience). Bishop et al. (2006) found emissions were greatest during initial startup and idling, especially when the engine is cold. They also observed reducing wait times at entrance stations would further lower emissions and exposure. Implementing similar measures or idling limits at parking lots and trailheads, may address public concerns regarding nuisance smell and potential impacts to air quality in those areas. It is anticipated any impacts to air quality from winter motorized recreation under alternative 2 - modified would not be expected to result in any violations to National and State Ambient Air Quality Standards.

A study by Musselman and Korfmacher (2007) was conducted in Wyoming to evaluate the effects of winter recreation snowmobile activity on air quality at a high-elevation site. They measured levels of nitrogen oxides (NO_x, NO), carbon monoxide (CO), ozone (O₃) and particulate matter (PM₁₀ mass). They found nitrogen oxides and carbon monoxide were significantly higher on weekends than weekdays due to higher snowmobile use on weekends. Ozone and particulate matter were not significantly different during the weekend compared to weekdays. Air quality data during the summer were also compared to the winter data and they found carbon monoxide levels at the site were significantly higher during the winter than during the summer. Nitrogen oxides and particulates were significantly higher during the summer compared to winter. Nevertheless, air pollutants were well dispersed and diluted by strong winds common at the site, and snowmobile emissions did not have a significant impact on air quality at the site (Musselman and Korfmacher 2007). It was determined that pollutant concentrations were generally low both winter and summer and were considerably lower than maximum levels allowed by the NAAQS (Raap 2014).

The U.S. Environmental Protection Agency has imposed stringent pollution regulations on snowmobiles and requires snowmobiles fall under regulations of the Clean Air Act. Authorized OSV use on national forest system lands may unavoidably affect the short term air quality in some areas. Minimization criteria measures to manage OSV use under alternative 2 would help ensure compliance with federal and state air quality regulations with regard to OSV emissions.

Class I and II Areas

In Yellowstone National Park, the implementation of best available technology (BAT) requirements and the reduction in the number of OSVs entering the park during the managed use era dramatically reduced carbon monoxide (CO), particulate matter (PM), and hydrocarbon emissions. The substantial CO and PM emissions reductions from implementing BAT requirements have come with one important tradeoff—an increase in nitrogen oxide (NO_x) emissions. Snowmobiles that meet BAT requirements have higher NO_x emissions than snowmobiles that do not meet BAT requirements. They found overall, from 2003 to 2011, air quality stabilized at the monitoring stations in the park, with the exception of 2010. These positive trends in air quality are primarily the result of BAT requirements for snowmobiles, fewer snowmobiles entering the park in recent years, and carbureted snow coaches being replaced with modern fuel-injected engines. Requiring the use of only BAT snowmobiles has improved emissions, despite the increasing number of snow coaches now entering the park. Although these changes present an overall positive trend toward lower emissions by OSVs, other local sources, such as uncontrolled wood stoves in warming huts and some facilities in the park, still contribute to winter CO and PM_{2.5} concentrations (USDI 2013).

It is anticipated that implementation of alternative 2 - modified would maintain the same air quality conditions as compared to current management due to low emissions generated from OSVs, as compared to other potential sources. It is anticipated air quality of the Class 1 areas would be similar to the current management. Compliance with state and Federal air quality standards is expected to occur under alternative 2 - modified. Motorized recreation emission sources in the Plumas are localized, transient, and not expected to result in any significant air quality impacts under alternative 2 - modified. No violations of the Clean Air Act are expected to occur.

Climate Change

Projected climate change through the 21st century will generate warmer temperatures and changes in precipitation that are expected to decrease the duration and extent of natural snow cover across the northern hemisphere (Wobus et al. 2017). The length of average snowmobile seasons in the 2020s were projected to be reduced between 11 and 40 percent under a low emission climate change scenario and between 39 and 68 percent under a high-emission climate change scenario. Under the high-emission scenario for the 2050s, a

reliable snowmobiling season would essentially be eliminated from Canada's non-mountainous regions. (Wakefield 2016)

A study in Vermont concluded declining snowfall in Vermont at the normal elevations of most snowmobile trails has already occurred and is likely to continue in coming years. Days of snow cover were a significant detractor and with fewer days of snow cover, participation rates would begin to decline. (Wakefield 2016). Based on this research, snowmobile usage in the Plumas could also decline or usage shift to higher elevation routes due to availability of snow. The quantity of greenhouse gas emitted is not expected to increase. With estimated annual visitor use of 22,250 in the Plumas, it is likely emissions contributions to the atmosphere would decline as visitor use declines due to lack of snow. Insufficient information is available to predict the effect of greenhouse gas emissions on global climate change from snowmobile use in the Plumas National Forest.

Implementation of alternative 2 - modified is expected to maintain the same air quality conditions as compared to the existing condition due to low emissions generated from OSVs as compared to other potential sources. Compliance with State and Federal air quality standards is expected to occur under alternative 2 - modified. Motorized recreation emission sources in the forest are localized, transient, and not expected to result in any significant air quality impacts under alternative 2 - modified. No violations of the Clean Air Act are expected to occur under alternative 2 - modified.

Cumulative Effects – Alternative 2 - Modified

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Past, present, and reasonably foreseeable future actions have the potential to impact air quality and are summarized below. Air quality in the forest is potentially affected by land management and development activities on and off the forest. Air pollution sources include emissions from industrial activity, highway vehicles, and off-road vehicles (all-terrain vehicles, aircraft, locomotives, construction machinery). Dust and burning can also have significant impacts to air quality as they are occurring on and off the forest. None of the on-forest sources are expected to increase or impact air quality when combined with alternative 2 - modified. In addition, emissions generated as a result of snowcats used for plowing and grooming of parking lots and trailheads could also contribute to localized air pollution in the forest. However, it is estimated the contribution of administrative snowcat use to the overall cumulative impacts on air quality would be minimal.

Air quality impacts are expected to grow with continued population growth around the Plumas National Forest. Substantial impacts to air quality are not expected to occur during winter months in the forest due to regulations already in place by the EPA and the Clean Air Act. The past, present, and reasonably foreseeable future actions would be the primary contributors to air quality impacts in the Forest. Due to the short-term and localized impact of OSV use, alternative 2 - modified is not expected to result in a significant contribution to the cumulative impacts of other local and regional air pollution sources. However, it is difficult to predict future pollutant discharge from off-forest mobile and stationary sources and how those sources may contribute or impact air quality in the forest. There are no known unavoidable adverse, irreversible, or irretrievable effects to air quality as a result of implementation.

Alternative 3

Direct and Indirect Effects – Alternative 3

Emissions generated as a result of current OSV use in the Plumas National Forest are estimated to contribute less than 1 percent of carbon monoxide (CO), nitrogen oxide (NOx), and particulate matter (PM) to the air

districts within the Plumas National Forest (table 28). The estimated 22,250 OSV visitors forestwide for the winter season would equate to approximately 227 OSV visitors in the forest per day (using 33 weekend/holidays and 65 weekdays per season) using approximately 220 miles of trail and 600,542 acres for OSV use. That is equivalent to approximately one OSV visitor per 27 acres. Implementation of alternative 3 would be expected to maintain the same air quality conditions as compared to current management due to low emissions generated from OSVs, as compared to other potential sources. It is anticipated air quality of the Class 1 areas would be similar to the current management. Compliance with State and Federal air quality standards is expected to occur. Motorized recreation emission sources in the forest are localized, transient, and not expected to result in any significant air quality impacts. No violations of the Clean Air Act are expected to occur.

The U.S. Environmental Protection Agency has imposed stringent pollution regulations on snowmobiles and requires snowmobiles fall under regulations of the Clean Air Act. Authorized OSV use on national forest system lands may unavoidably affect the short term air quality in some areas. Minimization criteria measures to manage OSV use under alternative 3 would help ensure compliance with federal and state air quality regulations with regard to OSV emissions.

Cumulative Effects- Alternative 3

The cumulative effects discussed for alternative 2 - modified, would also apply for alternative 3.

Alternative 4

Direct and Indirect Effects – Alternative 4

Emissions generated as a result of current OSV use in the Plumas National Forest are estimated to contribute less than 1 percent of carbon monoxide (CO), nitrogen oxide (NO_x), and particulate matter (PM) to the air districts within the forest (table 28). The estimated 22,250 OSV visitors forestwide for the winter season would equate to approximately 227 OSV visitors in the forest per day (using 33 weekend/holidays and 65 weekdays per season) utilizing approximately 577 miles of trail and 1,160,793 acres for OSV use. That is equivalent to approximately one OSV visitor per 52 acres. Implementation of alternative 4 is expected to maintain the same air quality conditions as compared to current management due to low emissions generated from OSVs as compared to other potential sources. It is anticipated air quality of the Class 1 areas would be similar to the current management. Compliance with State and Federal air quality standards would be expected to occur. Motorized recreation emission sources in the forest are localized, transient, and not expected to result in any significant air quality impacts. No violations of the Clean Air Act are expected to occur.

Alternative 4 is expected to exhibit similar air quality conditions as compared to current management. The U.S. Environmental Protection Agency requires each new engine, vehicle, or equipment meets the latest emission standards. Emission sources on the forest are localized, transient and not expected to result in impacts to populated areas and class 1 areas.

Cumulative Effects- Alternative 4

The cumulative effects discussed for alternative 2 -modified, would also apply for alternative 4.

Alternative 5

Direct and Indirect Effects – Alternative 5

Emissions generated as a result of current OSV use in the Plumas National Forest are estimated to contribute less than 1 percent of carbon monoxide (CO), nitrogen oxide (NO_x), and particulate matter (PM) to the air

districts within the Plumas (table 28). The estimated 22,250 OSV visitors forestwide for the winter season would equate to approximately 227 OSV visitors in the forest per day (using 33 weekend/holidays and 65 weekdays per season) using approximately 210 miles of trail and 651,877 acres for OSV use. That is equivalent to approximately one OSV visitor per 28 acres. Implementation of alternative 5 would be expected to maintain the same air quality conditions as compared to current management due to low emissions generated from OSVs as compared to other potential sources. It is anticipated air quality of the Class 1 areas would be similar to the current management. Compliance with State and Federal air quality standards is expected to occur. Motorized recreation emission sources in the Plumas are localized, transient, and not expected to result in any significant air quality impacts. No violations of the Clean Air Act are expected to occur.

The U.S. Environmental Protection Agency has imposed stringent pollution regulations on snowmobiles and requires snowmobiles fall under regulations of the Clean Air Act. Authorized OSV use on national forest system lands may unavoidably affect the short term air quality in some areas. Minimization criteria measures to manage OSV use under alternative 5 would help ensure compliance with federal and state air quality regulations with regard to OSV emissions.

Cumulative Effects- Alternative 5

The cumulative effects discussed for alternative 2 - modified, would also apply for alternative 5.

Compliance with LRMP and Other Relevant Laws, Regulations, Policies and Plans

No known violations of ambient air quality standards have occurred in the Plumas National Forest, nor have any activities in the forest caused violations of these standards elsewhere. The alternatives comply with the Clean Air Act, the National Ambient Air Quality Standards, and California Ambient Air Quality Standards for criteria pollutants.

Unavoidable Adverse Effects

Authorized OSV use on NFS lands, may unavoidably affect the short-term air quality in some areas, specifically at trailheads and parking lots. However, it is likely this is a nuisance smell issue rather than an air quality issue.

Terrestrial Wildlife

This section summarizes potential effects of the alternatives for the Plumas OSV-use Designation on federally listed and Regional Forester's sensitive species (i.e., sensitive species) as disclosed in the project Biological Evaluation (BE) and Biological Assessment (BA), as well as management indicator species (MIS) and migratory landbirds. Potential effects of OSV use and trail grooming, including associated actions, to terrestrial wildlife species of public interest are also disclosed and analyzed.

The following sections apply to both federally listed and Forest Service sensitive species: Topics and Issues Addressed in this Analysis, Methodology, Information and Data Sources, Incomplete and Unavailable Information, and Spatial and Temporal Context for Effects Analysis.

Issues

Issue 3a is specific to terrestrial wildlife.

The proposed OSV-use designations and trail grooming have the potential to directly, indirectly, and cumulatively impact aquatic and terrestrial wildlife and plant species, including federally listed, threatened,

and endangered species and their habitats. OSV-use designations and trail grooming may impact terrestrial wildlife by:

- a. Causing injury or mortality to wildlife and plant species through crushing (or other contact);
- b. Causing disturbance (e.g., increased noise and human presence resulting in interrupted or lost breeding or feeding opportunities, or movement patterns);
- c. Causing habitat destruction or modifications through rutting of the underlying habitat, road, or OHV trail, which could result in sediment delivery during the subsequent runoff season. Spilling or leaking of fuels or oils from OSVs could cause stream contamination at stream crossings;
- d. Causing the zone of potential impacts to broaden by designating OSV-use areas rather than restricting OSV use to designated trails; and
- e. Causing potential increases in OSV use in designated areas by designating trails, and thereby, facilitating access.
- f. Resource indicators and measures for terrestrial wildlife are described in table 32.

We used the following resource indicators and measures (table 32) in the analysis to measure and disclose effects to threatened, endangered, proposed, candidate, and sensitive (TEPCS) species and other species of public interest:

Table 32. Terrestrial wildlife resource indicators and measures for assessing effects

Resource Element	Resource Indicator	Measure	Source (LRMP S&G, law or policy, BMPs, etc.)
Marten	Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals, habitat modification (i.e., altered movement due to OSV use), or snow compaction effects to foraging or denning individuals	Acres of suitable habitat impacted by OSV use	2004 SNFPA ROD, Standard and Guideline 89, p. 62.
	Potential for loss of habitat connectivity	Acres of connectivity habitat with potential to be impacted by OSV use	2004 SNFPA ROD, Standard and Guideline 89, p. 62.
California spotted owl	Potential for disturbance to or displacement of individuals from noise and increased human presence, injury or mortality of individuals	Acres of suitable CSO habitat impacted by OSV use	Minimization Criteria: 36 CFR 212.55(b)(2)
	Potential for disturbance to or displacement of individuals from OSV use and increased human presence, injury or mortality of individuals	Acres of CSO PAC impacted by OSV use	2004 SNFPA ROD, Standard and Guideline 82, p. 61
Northern goshawk	Potential for disturbance to individuals from noise and increased human presence, or injury or mortality of individuals	Acres of suitable habitat impacted by OSV use	Minimization Criteria: 36 CFR 212.55(b)(2)
	Potential for disturbance to individuals from OSV use and increased human presence, or injury or mortality of individuals	Acres of NOGO PACs impacted by OSV use	2004 SNFPA ROD, Standard and Guideline 82, p. 61
Bald eagle	Potential for disturbance to individuals from OSV use and increased human presence or injury or mortality of individuals	Acres of Primary Use Areas within 500 feet of designated OSV trails	Bald and Golden Eagle Protection Act Migratory Bird Treaty Act 1988 Plumas National Forest LRMP, Bald Eagle Habitat Prescription (Rx-11) Minimization Criteria: 36 CFR 212.55(b)(2)
	Potential for disturbance to individuals from OSV use and increased human presence or injury or mortality of individuals	Acres of bald eagle nest territories within 660 feet of OSV trails	Bald and Golden Eagle Protection Act Migratory Bird Treaty Act 1988 Plumas National Forest LRMP, Bald Eagle Habitat Prescription (Rx-11) Minimization Criteria: 36 CFR 212.55(b)(2)

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Resource Element	Resource Indicator	Measure	Source (LRMP S&G, law or policy, BMPs, etc.)
Mule deer/winter range	Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals, or habitat modification (i.e., altered movement due to OSV use)	Acres of winter range affected by OSV use	Minimization Criteria: 36 CFR 212.55(b)(2)
Wolves	Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals, or habitat modification (i.e., altered movement due to OSV use)	Acres of range affected by OSV use	Minimization Criteria: 36 CFR 212.55(b)(2)
Willow flycatcher, western bumble bee, bats	Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals, or habitat modification (i.e., altered movement due to OSV use)	Acres of willow flycatcher habitat impacted by OSV use	FSM 2672.4
		Qualitative discussion on impact to western bumble bee and bats	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 Plumas 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 percent, slopes less than 20 percent; see below) and areas in which OSV use would be permitted under each alternative. The resulting total acres and percentages of habitat, by assumption and alternative, were disclosed and compared. Using best available scientific information, known reproductive sites were buffered California spotted owl PACs (0.25 mile), goshawk PACs (0.25 mile), and bald eagle Primary Use Area 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 Plumas 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 Final Environmental Impact Statement (FEIS) - OSV Use Assumptions for Analysis 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 Environmental Impact Report, 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 percent: California Wildlife Habitat Relationships (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: Staging areas; designated OSV trail (groomed and ungroomed);

- Staging areas
- Designated OSV trail (groomed and ungroomed)
- Areas within 0.5 mile of snowmobile staging areas
- Meadows within 0.5 mile of a designated OSV trail

Moderate Use:

- Areas within 0.5 mile of NFS roads within designated OSV areas
- Areas between 0.5 and 1.5 miles of designated OSV trails
- Meadows 10 acres or greater in size, or 0.5 to 1.5 miles from designated OSV trails

Areas Not Conducive to OSV Use (Low-to-No Use):

Low Use:

- California Wildlife Habitat Relationships (CWHR) vegetation 2D, 3D, 4D, 4M, 5D, 5M, 6; vegetation size 5 and 6 with a slope greater than 20 percent
- Meadows 1.5 miles or greater from OSV trail
- Areas more than 1.5 miles from a designated 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 (USDA Forest Service 2001) and Record of Decision for Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004)
- Assessing the Cumulative Effects of Linear Recreation Routes on Wildlife Habitats on the Okanogan and Wenatchee National Forests. Gen. Tech. Rep. PNW-GTR-586 (Gaines et al. 2003)
- Species' literature
- Personal communications with researchers, Forest Service Region 5 Regional Office staff and Plumas National Forest staff
- California Wildlife Habitat Relationships (2014)
- EVEC data
- Plumas National Forest Land and Resource Management Plan (1988)
- Available Plumas National Forest GIS Data
- Natural Resources Management (NRM) Wildlife Data

Incomplete and Unavailable Information

Over-snow vehicle use is not consistent across all available habitat. Although we do not 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 in the Plumas National Forest, is unknown.

Climate change, when identified as a specific threat (marten) or stressor 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 Plumas 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 G 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 FEIS 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 G of the FEIS and include vegetation management activities, 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 May 15 and October 31, annually, although grazing starts between April 25 and May 1 on a handful of allotments.

Potential effects of the Plumas National Forest OSV 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 Plumas 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 Forest Service spatial data provided by the Plumas 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. 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.

Environmental Consequences

Federally Listed Species and Critical Habitat

This section summarizes findings from the project biological evaluation and biological assessment, 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 wildlife species.

Consultation to Date

Official species lists for the Plumas National Forest Over-snow Vehicle Use Designation Project were obtained on March 4, 2019, from the Sacramento and Reno Field Offices of the U.S. Department of the Interior, Fish and Wildlife Service (USDI Fish and Wildlife Service 2018a and b). The lists identify wildlife species to consider, because they may be present within the general area of the Plumas National Forest. Federally listed species considered for analysis are shown in table 33.

Table 33. Terrestrial threatened, endangered, proposed, and candidate species and designated or proposed critical habitat considered within this analysis

Species Name	TEPC Status ⁶	Project Area Within Species' Range	Detections in or Near the Project Area	Suitable Habitat Present	Species Addressed Further/Rationale	Determination
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	FT	Yes	No	No	No. Suitable breeding habitat does not occur in the project area	Not applicable
Yellow-billed cuckoo proposed critical habitat	NA	No	No	No	No; Project area is outside the proposed critical habitat	Not applicable
Gray wolf (<i>Canis lupus</i>)	FE	Yes	Yes	Yes	Yes	May affect, not likely to adversely affect
Valley elderberry longhorn beetle (<i>Democerus californicus dimorphus</i>)	FT	No	No	No	No. Project area is outside the known distribution of this species	Not applicable
Valley elderberry longhorn beetle critical habitat	NA	No	No	No	No. Project area is outside the designated critical habitat	Not applicable
Carson wandering skipper (<i>Pseudocopa eodes eunus obscurus</i>)	FE	No	No	No	No. Project area is outside the known distribution of this species	Not applicable

⁶ 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 July 16, 2018, from the Sacramento and Reno 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 ⁶	Project Area Within Species' Range	Detections in or Near the Project Area	Suitable Habitat Present	Species Addressed Further/Rationale	Determination
California wolverine (<i>Gulo gulo luteus</i>)	FP/FSS	Yes	No	Yes. In very high elevations	No. OSV use is not expected to occur in areas of potential habitat. No documentation species occurs in the forest.	No Effect

Table 34 summarizes the determinations of effect for federally listed species and critical habitats.

Table 34. Summary of determinations of effect for federally listed threatened, endangered, proposed, and candidate species and designated or proposed critical habitats, by alternative

Species Name	TEPC Status ⁷	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
California wolverine	FP	NE	NE	NE	NE	NE
Gray wolf	FE	NLAA	NLAA	NLAA	NLAA	NLAA

Species Not Analyzed in Detail

Western Yellow-billed Cuckoo

Western populations of this species currently nest in scattered, isolated areas west of the Rocky Mountains, in California (mainly in isolated sites in the Sacramento, Amargosa, Kern, Santa Ana, and Colorado River valleys) (NatureServe 2017). 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.

In 2015, breeding habitat for the Western yellow-billed cuckoo was modeled on the Plumas National Forest (Martinez et al 2015). It was concluded that although the Plumas National Forest does not currently appear to support breeding habitat for yellow-billed cuckoos, migrating cuckoos could potentially pass through the area. However, given the lack of suitable nesting habitat on the Forest, including foraging habitat within nesting territories, it is doubtful that migrant cuckoos would pass through such mountainous terrain when occupied nesting habitat is available for migrant use adjacent to the Forest (e.g., Sacramento and Carson Rivers). Further, lack of cuckoo observations on bird checklists from the Forest does not support the idea that migrant cuckoos routinely traverse the Forest.

There are no known occurrences of this species found in the Plumas 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 greater 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,

⁷ FE = federally endangered; FT = federally listed as threatened; FP = federal proposed for listing; FC = federal candidate for listing; FSS = Forest Service sensitive.

polycyclic aromatic hydrocarbons (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).

The minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are 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, this species will not be discussed in further detail.

Carson Wandering Skipper

This species has been eliminated from required further analysis due to lack of species distribution and lack of designated critical habitat within the forest boundary.

Valley Elderberry Longhorn Beetle

Elderberry beetles are intimately associated with their host plants (*Sambucus* spp.) for their entire lifecycle, displaying a mutualism in which a place to live is traded for help in reproduction. It is found exclusively in association with its host plant, elderberry (*Sambucus* spp.). Riverine systems and riparian zones that provided oases for native species once intersected California's landscape. Development pressures have changed much of the landscape replacing the elderberry savannah with homes and farms. More than 90 percent of these riparian forests have been lost to development, and is only found in a few riparian parks that sit between patches of development.

Elderberry trees are a riparian obligate species. 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).

The minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016).

Although this species is known to occur in the forest, they are not known to occur within the project area. This species occurs in lower elevations that are not conducive to OSV use. No critical habitat is found within or adjacent to the project area. Due to the project area being outside the range of the species, and due to a lack of downstream effects from project activities, this species will not be discussed in further detail.

North American Wolverine

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,⁸ and disturbance at a specific site,⁹ usually wintering areas.

⁸ Spatial shifts in populations or individual animals away from human activities on or near roads, trails, or networks

⁹ Displacement of individual animals from a specific location that is being used for reproduction and rearing of young

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:

(1) Displacement from or avoidance of human activity on or near roads; and (2) Displacement of individual animals from breeding or rearing habitat.

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 miles per hour). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds. Vehicle collision with a wolverine would negatively affect that particular animal, but the likelihood of occurrence is assumed to be rare.

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

Although recreational activities such as snowmobiling and backcountry skiing have the potential to affect wolverines (USDI 2013), elevations where wolverine habitat may occur in the Plumas National Forest are not typically areas where OSV use occurs. Additionally, wolverines are not known to occur in the Plumas National Forest. Therefore, this species will not be discussed in further detail.

Species Analyzed in Detail

Gray Wolf (*Canis lupis*)

Wolves have been sighted recently in California starting back in 2011 when OR7, a single male gray wolf, travelled hundreds of miles throughout California. OR7 eventually returned north and has been residing in Southern Oregon. Additional wolf encounters have had a pack (adults with young) in Shasta-Trinity National Forest, a pair on Lassen National Forest, and an individual that entered Nevada near Tahoe National Forest. Sightings have also occurred in the Plumas National Forest in the northern area of the Mount Hough Ranger District.

Gray wolves are habitat generalists inhabiting a variety of plant communities, typically containing a mix of forested and open areas within 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 aspect 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 forest cover remote from human disturbance. There are no known den sites located in the Plumas National Forest or in the project area. 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.

Resource indicators and measures used in this analysis to measure and disclose effect to the gray wolf are listed in table 35.

Table 35. Resource indicators and measures for assessing effects to gray wolf

Resource Indicator and Effect	Measure (Quantify if possible)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals, or habitat modification (i.e., altered movement due to OSV use)	Acres of deer winter range affected by OSV use	21,330 acres	30,751 acres	9,593 acres	41,477 acres	9,593 acres

Direct and Indirect Effects

Snowmobile use and associated activities within habitats for gray wolves can have the following effects to individuals or their habitat (Gaines et al. 2003). Potential direct effects include:

- Displacement or avoidance away from human activity on or near roads; and
- Displacement of individual animals from breeding or rearing habitat.

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 miles per hour). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds. Vehicle collision with a gray wolf 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 and activity near a route or human activities on or near a route or within open areas.

Effects from This Project

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

Incidental disturbance of individual wolves from OSV use of established trails and cross-country travel is possible. The degree of effect is likely related to the intensity and duration of OSV disturbance. Studies of snowmobile use and wolf movements in Voyageurs 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).

Over-snow vehicle use of groomed trails is expected to be frequent under all alternatives. Consequently, there is an increased likelihood that wolves would avoid these areas. Alternatives 1, 2 - modified, 3, and 5 contain nearly identical amounts of groomed trails; therefore, the effect of groomed trails is similar. Alternative 4 contains slightly higher amounts of groomed trails but it is not significant enough to cause additional effects. Existing linear routes (i.e., roads and trails) in areas outside groomed trails designated for OSV travel (including existing roads and trails) are expected to receive less human use, resulting in decreased disturbance and potential displacement of wolves. Areas outside of existing linear trails and physical barriers and slope limitations, although open meadows or parks adjacent to linear trails may attract more use. The amount of area designated for OSV use varies by alternative. Alternative 4 would be the least restrictive, restricting 37,109 acres. Alternative 5 would restrict travel within 545,780 acres, while the proposed action (alternative 2 - modified) provides restrictions on 333,076 acres. Alternative 3 would be the most restrictive, not designating 597,360 acres for OSV use. This alternative would not designate areas below 3,500 feet elevation for OSV use, which would include all portions of mapped mule deer winter range.

Impacts to Primary Prey

Wintering deer are sensitive to disturbances of all kinds. Snowmobile use is 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 for snowmobiles include collisions causing mortality and harassment that increased metabolic rates and stress responses (Canfield et al. 1999).

Over-snow vehicle use of existing linear routes and cross-country travel is allowed within wolf range, at some level, under all alternatives. There is currently 232,607 acres of deer winter habitat in the Plumas National Forest, only 9 percent is open and conducive to use under the current condition. Of that 9 percent, roughly 21,330 acres or 51 percent of winter range is open to OSV and conducive to use (slopes less than 20 percent and canopy cover less than 70 percent). The amount of winter range with potential for impacts would be the same under alternative 4 as alternative 1 but substantially less under alternative 2 - modified, at approximately 1.4 percent, under alternative 3 at 0.04 percent, and alternative 5 at 0 percent.

Summary of Effects

Alternative 5 provides the largest amount of area where OSVs would be excluded, thereby potentially producing the lowest amount of disturbance spatially in addition to avoiding cross-country travel within all deer winter range. Alternative 2 - modified, alternative 3, 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 alternative provide some disturbance-free portions within winter range, alternative 5 provides the largest amount of OSV-restricted area within mule deer winter range.

Cumulative Effects

Based upon spatial data provided by the Plumas National Forest, vegetation management or fuels management projects are projected to occur within the Plumas 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 are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and non-groomed OSV trails or staging areas where the high OSV use occurs. Recreation activities such as camping, hiking, hunting, and fishing are ongoing and wolf-livestock conflicts if wolves become established, but because livestock are normally present on allotments during the snow-free period, overlap of effects within this project are

unlikely. Use of roads for public and administrative access contributes a level of disturbance primarily during the snow-free period. This 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 reasonable foreseeable actions may be additive locally, but are not expected to contribute substantial impacts to effects discussed for project under any of the alternatives.

Determination Statement

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

- Mitigation measures are incorporated into all alternatives in order to prevent potential OSV disturbance impacts to gray wolf denning and rendezvous sites.
- Wolves are less likely to occur within most of the project area from December through April due to seasonal shifts of prey species to winter range.
- Potential for direct impacts to wolves from collisions with OSVs is very low.

Forest Service Sensitive Species

This section summarizes findings on Forest Service sensitive species from the project biological evaluation that was prepared in accordance with policy established in Forest Service Manual direction (FSM 2670). Federally listed species considered for analysis are shown in table 36.

Table 36 summarizes the determinations of effect for Forest Service sensitive species.

Table 36. Terrestrial Forest Service Sensitive Species considered within this analysis and determinations

Species Name	Project Area Within Species' Range	Detections in or Near the Project Area	Suitable Habitat Present	Species Addressed Further/Rationale	Determination
Late-successional Forest species					
Fisher (<i>Pekania pennanti</i>)	No	Yes	No Project area considered a distribution gap within the species' range.	No Project area is outside known distribution	NA*
Pacific marten (<i>Martes caurina</i>)	Yes	Yes	Yes	Yes	MII**
California spotted owl (<i>Strix occidentalis occidentalis</i>)	Yes	Yes	Yes	Yes	MII
Northern goshawk (<i>Accipiter gentilis</i>)	Yes	Yes	Yes	Yes	MII
Bats					
Fringed myotis (<i>Myotis thysanodes</i>)	Yes	Yes	Yes	Yes	MII
Pallid bat (<i>Antrozous pallidus</i>)	Yes	Yes	Yes	Yes	MII
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	Yes	Yes	Yes	Yes	MII
Species that Utilize Riparian or Wetland Habitats					
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Yes	Yes	Yes	Yes	MII
Great gray owl (<i>Strix nebulosa</i>)	Yes	No	Yes	No. This species is not typically found in the forest.	NE
Willow flycatcher (<i>Empidonax traillii</i>)	Yes	Yes	Yes	Yes	MII
Greater Sandhill crane (<i>Grus canadensis tabida</i>)	Yes	Yes	Yes	No. Species is not found in the project area during times of OSV use	NE
Terrestrial Invertebrates					
Western bumble bee (<i>Bombus occidentalis</i>)	Yes	Yes	Yes	Yes	MII

* NA - reintroduced fisher on private lands have temporarily used forest lands along the property border. Project area is currently assumed to be unoccupied and there is no indication that fisher are using the project area.

** MII - may impact individuals, but are not likely to lead to a loss of viability or a trend toward Federal listing

Species Not Analyzed in Detail

Fisher

Fishers occupy mid-elevation, multi-storied mature and old-growth conifer, mixed conifer and mixed-conifer hardwood forests with contiguous canopy cover. Previous work on west coast populations of fishers found that dense forest canopy was one of the most consistent predictors of fisher habitat (Olson et al. 2014). Weir and Corbould (2010 in Olson et al. 2014) found that fishers selected stands with greater than 30 percent canopy cover. Purcell et al (2009 in Olson et al. 2014) found canopy cover to be the most important variable at predicting fisher resting sites, and Zielinski et al (2004 in Olson et al. 2014) showed that higher average canopy cover was critical for predicting fisher resting habitat. They do not occur in high-elevation alpine or subalpine habitats.

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).

Sierra Pacific Industries reintroduced fisher on lands adjacent to the Plumas National Forest. Reintroductions began in November 2009, with 40 fishers released by the end of 2011 (CDFW 2018). Although reintroduced fishers have used forest lands along the property border (North Fork of the Feather River, Mt Hough Ranger District), the extent to which fisher are using the forest is unknown. Zielinski et al. (2005) concluded that Plumas National Forest falls within an area considered a distribution gap within the range of the fisher. This species will not be discussed in further detail due to the project area being outside the range of the species.

Although potential project impacts are not analyzed in detail because the species does not occur in the project area, the EIS presents law, regulation, and direction related to fisher and a detailed analysis and mitigations addressing potential project impacts on a forest carnivore that currently occurs in the project area, and occupies similar habitat (American marten). Should fisher colonize the project area in the future, management direction in the EIS designed to mitigate threats to fisher will immediately be implemented (e.g., den site buffers) while analyzing project impacts on the species.

Greater Sandhill Crane (*Grus canadensis tabida*)

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).

The minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to be adequate to protect aquatic and riparian habitats from measurable impacts to vegetation or water quality (McNamara 2016).

None of the alternatives of the Plumas National Forest Over-snow Vehicle Use Designation Project would impact the greater sandhill crane or its habitat 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 depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to be adequate to protect wet meadow and fresh emergent wetland habitats used by this species from measurable impacts to vegetation or water quality.

For these reasons, the greater sandhill crane will not be discussed in further detail.

Great Gray Owl (*Strix nebulosa*)

Local data indicate that the owl is an uncommon visitor to the Plumas National Forest and has not been detected during the last decade in the forest. Great gray owl has been reported in the Plumas during 12 of the last 38 years (1980-2017, NRIS Wildlife). Except for 1981 (n=5 observations), 1997 (n=2 observations), and 2007 (n=3 observations), all observation years contained a single owl sighting (1980, 1983, 1985, 1989, 1995, 1999, 2002, 2005, 2006, 2007). The forest has never detected nesting behavior or Primary Use Areas, young of the year, nor feathers during great gray owl surveys. Extensive great gray owl survey efforts over the last nine years (2008-2016) failed to detect great gray owls where historic detections occurred, or elsewhere in the forest. Further, 10 of the 12 owl species known to occur in the forest have been detected during nine years of intensive survey effort (2008-2016) where great gray owls were historically observed, the exceptions being the great gray owl and barn owl. For these reasons, the great gray owl will not be discussed in further detail.

Late-successional Forest Species

Pacific Marten (*Martes caurina*)

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 37.

Table 37. Resource indicators and measures for assessing effects to marten

Resource Indicator and Effect	Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals, habitat modification (i.e., altered movement due to OSV use), or snow compaction effects to foraging or denning individuals	Acres of suitable habitat impacted by OSV use	349,156	305,337	257,864	352,150	283,415
Potential for loss of habitat connectivity	Acres of connectivity habitat with potential to be impacted by OSV use	98,931	77,892	61,470	99,187	62,210

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.

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 diameter at breast height 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. Kirk and Zielinski (2010) modeled dispersal corridors between protected areas and known marten population centers by dividing northeastern California into six landscape linkages, extending from the Southern Cascades through the Sierra Nevada to Lake Tahoe.

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,¹⁰ and disturbance at a specific site,¹¹ 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.

In addition to the roads and trails 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; by creation of a vector pathway for competitors or predators, snow compaction impacts to den sites or prey habitat. Boyle and Samson (1985) state that recreationists can affect wildlife through habitat alteration, disturbance, or direct mortality. Mechanized forms of recreation present the most serious potential impacts. 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

¹⁰ Spatial shifts in populations or individual animals away from human activities on or near roads, trails, or networks

¹¹ Displacement of individual animals from a specific location that is being used for reproduction and rearing of young

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. 2008). Although Zielinski et al. (2008), 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 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 percent) martens generally avoid habitats that lack overhead cover (canopy cover less than 30 percent), such as trails and meadows, where OSV use would most pronounced, Presumably, a marten would hear an OSV and flee before injury or collision.

Competition and Predation

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

Snow Compaction Effects to Denning Individuals and Prey Species

Martens use the space beneath the snow to access prey 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 natal and maternal dens may be found (B. Zielinski, pers. comm.). Sierra Nevada Forest Plan Amendment standards and guidelines designed to protect marten den sites¹² 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.

¹² "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."

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 space beneath the snow. Snow compaction alters the mild subsnow microclimate and can increase winter mortality of prey species (Schmidt 1971 in Boyle and Samson 1985).

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 20 percent and canopy cover less than 70 percent, including the routes and staging areas, themselves, are more conducive to OSV use 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 38, 88 percent of marten winter habitat is currently open to OSV use (alternative 1). However, only 31 percent is open to OSV use and conducive to OSV use. The potential for OSV-related noise-based disturbance, injury or mortality, competition or predation, or snow compaction effects (den sites or prey species) impacting individual martens would be most likely to occur within that 31 percent of winter habitat. With the modified alternative 2, 76 percent of winter habitat is currently open to OSV use, with only 28 percent open to OSV use and conducive to OSV use. The amount of habitat under the remaining alternatives is similar to alternative 1: alternative 3, 25 percent, alternative 4, 31 percent, and alternative 5, 27 percent.

Marten den sites have been observed in the Plumas National Forest.

Table 38. Acres of marten winter habitat¹³ by alternative

	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Open to OSV use	349,156	305,337	257,864	352,150	283,415
Not designated for OSV use	47,526	96,104	138,818	44,532	113,267
Total acres of marten winter habitat	396,682	401,441	396,682	396,682	396,682
Open to OSV use and conducive to OSV use	122,862	114,012	98,266	124,546	109,135
Not designated for OSV use but conducive to OSV use	20,331	30,734	44,927	18,647	34,058
Total acres conducive to OSV Use	143,193	144,746	143,193	143,193	143,193

Marten whelping season (March to April) overlaps with the latter portion of the OSV season. Although den sites could be physically impacted, the Plumas National 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.

¹³ Rustigian-Romsos and Spencer (2010) Conservation Biology Institute Marten Habitat Suitability Model

Based on Kirk and Zielinski (2010), least cost corridor modeled marten connectivity habitat in the Plumas National Forest, 79 percent (30 percent for alternative 3) are currently open to OSV use (alternative 1; table 39). However, 32 percent (30 percent for alternative 3) is currently open to OSV use and conducive to OSV use. Of that, 32 percent (30 percent for alternative 3) of habitat, high OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within less than 32 percent (30 percent for alternative 3) of marten habitat. There is little difference in the amount of marten connectivity habitat that would be open to and conducive to OSV use under the other three alternatives (31 percent under alternative 2 - modified, 32 percent under alternative 4, and 30 percent under alternative 5), but alternative 3 would have the least impact on marten connectivity habitat overall.

Table 39. Acres of marten habitat connectivity corridors¹⁴ by alternative

	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Acres open to OSV use	98,931	77,892	61,470	99,186	62,010
Acres not designated for OSV use	26,804	58,229	64,265	26,549	63,725
Total acres of marten habitat connectivity corridors ¹⁵	125,735	136,121	125,735	125,735	125,735
Acres open to OSV use and conducive to OSV use	30,859	32,356	29,194	33,446	29,194
Acres not designated for OSV use but conducive to OSV use	9,856	9,221	8,670	7,269	8,670
Total acres conducive to OSV use	40,715	41,577	37,864	40,715	37,864

It is unknown if OSV use (or related activities) in the Plumas 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 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail and moderate use occurs within 0.5 mile of marked trails and in areas between 0.5 and 1.5 miles of groomed trails. Therefore, the majority of OSV use would occur within less than 25 to 31 percent of marten winter habitat or 30 to 32 percent of connectivity habitat. Similar to the results of natal and maternal den research, the results of other types of research, as it becomes available, would be used to determine whether disturbance is occurring and if changes in management are necessary. 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

Based upon spatial data provided by the Plumas National Forest, actions that could result in a cumulative impact to marten, when combined with alternatives 1, 2 - modified, 3, 4, or 5 include vegetation management projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between

¹⁴ Least Cost 25 percent Corridor Modeling (Kirk and Zielinski 2010)

¹⁵ Total acres of marten habitat connectivity corridors is the sum of high and moderate quality habitat.

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. Seasonal limited operating periods required for marten for vegetation projects prevent disturbance to breeding individuals.

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. 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 - modified, 3, 4, and 5 of the Plumas 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 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 25 to 31 percent under all of the alternatives, and connectivity habitat ranges from 30 to 32 percent, it is unknown if OSV use or related activities in the Plumas 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 mile 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 preferred by OSV recreationists. Therefore, the potential for disturbance or collisions along existing roads and trails 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 to April) overlaps with the latter portion of the OSV season, but the results of natal and maternal den and other types of research would be used to determine whether disturbance is occurring and if changes in management are necessary, thereby minimizing impacts to marten.
- It is unknown if or how much competition with or predation on martens by coyotes is occurring in the Plumas National Forest as the result of OSV-related snow compaction or other OSV-related activities; however, the potential for predation should be reduced because most OSV use in the Plumas National Forest occurs on groomed routes.
- 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*)

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 40.

Table 40. Resource indicators and measures for assessing effects to California spotted owl

Resource Indicator and Effect	Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to or displacement of individuals from OSV use and increased human presence, injury or mortality of individuals	Acres of CSO PAC impacted by OSV use	47,419	37,253	14,666	7,317	15,935
Potential for disturbance to or displacement of individuals from noise and increased human presence, injury or mortality of individuals	Acres of suitable CSO habitat impacted by OSV use	558,271	111,521	77,765	138,297	83,861

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:

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

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 in the Plumas occurs during daytime hours; and although snow grooming equipment operates during darkness, the equipment travels slowly (3 to 6 miles per hour).

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 sites used by small mammals in which small mammals can either be suffocated as a result of the compaction, or their under-snow movements can be altered owing to impenetrable compact snow. Adverse effects to species that use the spaces beneath the snow 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. 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.

OSV use has the potential to affect California spotted owls either directly through disturbance or displacement of individuals from routes, breeding or rearing habitats, potential for injury or mortality from collision, or indirectly through altered or dispersed movement caused by a route or human activities on or near a route. However, due to the structural nature of suitable habitat (i.e., dense forested stands), the level of cross-country 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. Based on the OSV-use assumptions, 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 California spotted owl PACs within 0.25 mile of groomed trails would decrease after March 31. Habitat would not be physically modified by OSV use and related activities.

The Forest Service considers activities greater than one-quarter mile (400 meters) from a spotted owl protected activity center (PAC) to have reduced 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 mile of California spotted owl PACs and/or suitable 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 20 percent conducive to OSV than others and, therefore, likely to receive the highest use. Those assumptions have been incorporated into the following analysis.

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).

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. 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).

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 PACs 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 suitable 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. Greater than 0.5 mile away of existing roads, trails and staging areas the potential for noise-based disturbance is actually expected to be lower because use, and therefore, the highest potential for disturbance is expected within 0.5 mile of existing roads, trails and staging areas, under all alternatives. Habitat would not be physically modified by OSV use and related activities.

Trail grooming¹⁶ occurs on existing roads and trails and primarily occurs at night when fewer species are active, but when spotted owls are more active. Trail grooming would not physically modify habitat. Under all alternatives the grooming season generally begins in mid-December and continues through March. Start and stop times vary per trail location dependent upon snow presence. Grooming starts in most locations with minimum snow depth of 12 to 18 inches. Trails are prioritized for grooming based on visitor use. Grooming on priority trails occurs several times per week and after major storms. Trail grooming occurs as soon as possible after a storm in which snow accumulations have been substantial. The ideal air temperature for grooming is 35 degrees Fahrenheit or less with the temperature dropping. Wet snow requires a lower temperature to set and is best groomed at night. 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. Direct cumulative effects could result with owls being disturbed diurnally while roosting and nocturnally while foraging with night grooming and night and day OSV riding with bigger impacts on owls along trails compared to open areas with less OSV use and no grooming.

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

Comparison of the Alternatives

Table 41 compares, by alternative, the acres of known PACs buffered by 0.25 mile and suitable California spotted owl habitats, respectively, with the potential for direct and indirect effects from OSV use and related activities. Eighty-eight percent of California spotted owl PACs buffered by 0.25 mile are currently open to OSV use (alternative 1). However, only 17 percent is open to OSV use and conducive to OSV use. Similarly, 74 percent of suitable California spotted owl habitat is currently open to OSV use, but only 19 percent is open to OSV use and conducive to OSV use. Similarly, under alternative 2 - modified, 65 percent of suitable California spotted owl habitat is currently open to OSV use, but only 19 percent is open to OSV use and conducive to OSV use, and 81 percent of buffered PACs is currently open to OSV use, but only 16 percent is open to OSV use and conducive to OSV use. The potential for OSV-related impacts to California spotted owls, including noise-based disturbance, snow compaction impacting prey species, or injury/mortality, would be most likely to occur in those areas conducive to OSV use. In addition, of the 17 percent of buffered PACs and the 19 percent of suitable habitat open to and conducive to OSV use, high OSV use is concentrated

¹⁶ 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. Snow removal on access roads and trailhead parking areas, serving the OSV Program trail systems, occurs several times during storm events as necessary dependent upon weather conditions (California Department of Parks and Recreation 2010).

within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within in an even smaller percentage of each of those habitats. This would be similar under the other three alternatives.

Table 41. Acres of known California spotted owl (CSO) PACs, buffered by 0.25 mile, by alternative

	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Open to OSV Use	7,186	5,898	1,986	7,317	2,116
Not designated for OSV use	996	1,423	784	865	654
Total acres of known CSO PACs, buffered by 0.25 mile	8,182	7,321	2,770	8,182	2,770
Open to OSV use and conducive to OSV use	1,364	1,189	369	1,406	431
Not designated for OSV use but conducive to OSV use	189	306	207	147	145
Total acres conducive to OSV use	1,553	1,495	576	1,553	576

Under alternative 3, 22 percent of suitable California spotted owl habitat and 13 percent of buffered PACs would be open and conducive to OSV use. Similarly, 19 percent of suitable habitat and 17 percent of buffered PACs would be open and conducive to OSV under alternative 4 and 23 percent of suitable habitat and 15 percent of buffered PACs under alternative 5. 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 15 California spotted owl breeding season under all alternatives. 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 PACs within 0.25 mile of groomed trails would decrease by an estimated 50 percent after March 31 for all alternatives. OSV-related surveys would be conducted if resource damage is suspected. Table 42 outlines the acres of suitable California spotted owl habitat by alternative.

Table 42. Acres of suitable California spotted owl habitat by alternative

	Alternative 1	Alternative 2 -Modified	Alternative 3	Alternative 4	Alternative 5
Acres Open to OSV Use	558,370	385,097	231,155	565,975	247,133
Acres Not designated for OSV use	160,350	209,559	126,982	152,746	111,004
Total acres of CSO habitat ¹⁷	718,720	594,656	358,137	718,720	358,137
Acres Open to OSV use and conducive to OSV use	135,428	110,312	77,765	138,297	83,861
Acres Not designated for OSV use but conducive to OSV use	46,546	59,729	35,543	43,677	29,447
Total acres conducive to OSV use	181,974	170,051	113,308	181,974	113,308

Cumulative Effects

Based upon spatial data provided by the Plumas 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 - modified, 3, 4, or 5, include vegetation management projects, firewood cutting, Christmas tree cutting,

¹⁷ Total acres of CSO habitat is the sum of high capacity roosting habitat, moderate capacity roosting habitat, and moderate foraging habitat.

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 projects are usually excluded from spotted owl reproductive habitat. Management prescriptions have emphasized recruitment of large snags and logs. 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. 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 all alternatives. 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. 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 Plumas 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 suitable habitat ranges from 19 to 23 percent, and individuals within buffered PACs ranges from 13 to 17 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.
- 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 PACs 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).
- 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.

Northern Goshawk (*Accipiter gentilis*)

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 43.

Table 43. Resource indicators and measures for assessing effects to northern goshawk

Resource Indicator and Effect	Measure	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from OSV use and increased human presence, or injury or mortality of individuals	Acres of goshawk PACs impacted by OSV use	6,887	5,203	2,314	6,983	2,474
Potential for disturbance to individuals from noise and increased human presence, or injury or mortality of individuals	Acres of suitable habitat impacted by OSV use	731,289	524,484	345,308	740,239	156,121

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

- Displacement of populations or individual animals from a route, related to human activities.
- Impact on prey species
- Disturbance and displacement of individuals from breeding (pair bond formation) or rearing habitats.

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 miles per hour). 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 7,491 acres of goshawk PACs, when each of the 59 PACs is buffered by 0.25 mile, and 930,230 acres of goshawk suitable habitat¹⁸, including high-reproductive habitat, in the Plumas National Forest.

Activities greater than one-quarter mile (400 meters) from a goshawk PAC have reduced potential to affect nesting goshawks. The OSV season overlaps with the courtship through incubation phases of the goshawk breeding season (Woodbridge and Hargis 2006), so snowmobiles passing within 0.25 mile of un-surveyed 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 in the Plumas National Forest. The same would be expected of OSV use in the Plumas National Forest. In addition, Dunk et al. (2011) found no evidence indicating experimental treatments, or research visits in general, influenced goshawk reproduction.

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 Goshawk PACs within 0.25 mile of groomed trails would decrease by an estimated 50 percent after March 31 for all alternatives.

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 conducive to OSV.

Comparison of the Alternatives

Table 44 and table 45 show and compare, by alternative, the amount of northern goshawk PACs and suitable 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 suitable goshawk habitat (i.e., dense forested stands), the level of cross-country travel in goshawk suitable habitat is less than the amount of available habitat. Ninety-two percent of goshawk PACs buffered by 0.25 mile are currently open to OSV use (alternative 1). However, 27 percent is open to OSV use and conducive to OSV use. The

¹⁸ Habitat types suitable for late-successional forest species 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 diameter at breast height with greater than 40 percent canopy cover (Sierra Nevada Forest Plan Amendment, USDA Forest Service 2004).

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 27 percent of buffered PACs and the 24 percent of suitable 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 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within in an even smaller percentage of each of those habitats; 12 goshawk PACs buffered by 0.25 mile (18 percent) fall within 0.5 mile of a groomed trail or OSV staging area. This would be similar under the other alternatives, except alternative 4 where 31 goshawk PACs fall within 0.5 mile of a groomed trail or OSV staging area.

Table 44. Acres of goshawk PACs, buffered by 0.25 mile, by alternative

	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Open to OSV use	6,887	5,203	2,314	6,983	2,474
Not designated for OSV use	605	2,043	1,147	509	987
Total acres of goshawk PACs buffered by 0.25 mile	7,492	7,246	3,461	7,492	3,461
Open to OSV use and conducive to OSV use	2,035	1,455	507	2,101	808
Not designated for OSV use but conducive to OSV use	5,457	5,791	2,954	5,391	2,653
Total acres conducive to OSV use	7,492	7,246	3,461	7,492	3,461

Under alternative 2 - modified, 24 percent of suitable northern goshawk habitat and 20 percent of buffered PACs would be open and conducive to OSV use. Similarly, 27 percent of suitable habitat and 15 percent of buffered PACs would be open and conducive to OSV under alternative 3; and 24 percent of suitable habitat and 28 percent of buffered PACs under alternative 4; and 30 percent of suitable habitat and 23 percent of buffered PACs under alternative 5. The potential for noise-based disturbance would largely overlap with roughly the first 20 percent, or the courtship (formation of breeding pairs, nest building, and copulation) phase of the February 15 through September 15 northern goshawk breeding season under all alternatives. The potential for direct and indirect effects to PACs within 0.25 mile of groomed trails would decrease by an estimated 50 percent after March 31 for all alternatives. 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. OSV related surveys would be conducted if resource damage is suspected.

Table 45. Acres of suitable goshawk habitat by alternative

	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Acres Open to OSV use	731,289	524,484	345,308	740,239	156,121
Acres Not designated for OSV use	198,941	253,567	181,902	189,991	371,089

	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Total acres of goshawk habitat ¹⁹	930,230	778,051	527,210	930,230	527,210
Acres Open to OSV use and conducive to OSV use	221,756	187,886	141,822	225,371	156,121
Acres Not designated for OSV use but conducive to OSV use	60,002	78,860	59,661	56,387	45,362
Total acres conducive to OSV use	281,758	266,746	201,483	281,758	201,483

Cumulative Effects

Based upon Forest Service spatial data provided by the Plumas National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to goshawk, when combined with alternatives 1, 2 - modified, 3, 4, or 5 include vegetation management projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and ungroomed OSV routes or staging areas where the highest OSV use occurs. Seasonal limited operating periods required for vegetation projects would prevent disturbance to breeding individuals. Vegetation and fuels management projects are usually excluded from goshawk reproductive habitat. Management prescriptions have emphasized recruitment of large snags and logs that are important attributes of goshawk habitat.

Goshawk habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. 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 goshawk breeding season under all alternatives. 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. 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 - modified, 3, 4, and 5 of the Plumas 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 the northern goshawk in the Forest Plan area based on the following rationale:

¹⁹ Total acres of goshawk habitat is the sum of high capability foraging habitat, high capability nesting habitat, moderate capability foraging habitat, and moderate capability nesting habitat.

- 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 as goshawk routinely use relatively open areas to hunt when compared to owls, 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 suitable habitat ranges from 24 to 30 percent, and individuals within buffered PACs ranges from 15 to 28 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; 18 percent of buffered goshawk PACs fall within 0.5 mile of a groomed trail or OSV staging area, the highest OSV-use areas.
- The potential for OSV-related noise-based disturbance would overlap with only the early part of the February 15 through September 15 goshawk breeding season.
- OSV use is most common on trails and once OSV trail grooming season ends on March 31, trail use declines by roughly 50 percent. As a result, the potential for direct and indirect effects to goshawk PACs within 0.25 mile of groomed trails would decrease by an estimated 50 percent after March 31 for all alternatives.
- 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.

Bats

Fringed Myotis (*Myotis thysanodes*)

Direct and indirect Effects

OSV use in the Plumas National Forest would not change the habitat for fringed 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, if 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 OSV use and grooming activities. Since there are no known winter roosts in the Plumas, 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 are no known bat hibernacula but disturbance of individuals could occur if an OSV use area is near any sites. Disturbance of individuals during certain times of the year can cause undue stress which can reduce survival rate. 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).

The minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are 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 Plumas National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to *M. thysanodes*, when combined with alternatives 1, 2 - modified, 3, 4, or 5, include vegetation management and fire salvage projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects 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.

M. thysanodes habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. 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 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 Plumas 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*)

Direct and indirect Effects

Over-snow vehicle use and related activities in the Plumas National Forest would not change the habitat for pallid bat, as no habitat modifications are anticipated. Over-snow vehicle noise could cause disturbance at the winter roost. This would be entirely dependent on the location of the winter roost in proximity to OSV use and grooming activities. Since there are no known winter roosts in the Plumas, 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 are no known bat hibernacula but disturbance of individuals could occur if an OSV use area is near any sites. Disturbance of individuals during certain times of the year can cause undue stress which can reduce survival rate. 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).

The minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are 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 Plumas National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to pallid bats, when combined with alternatives 1, 2 - modified, 3, 4, or 5, include vegetation management and salvage projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and ungroomed OSV routes or staging areas where the highest OSV use occurs.

Pallid bat habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. 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 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 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 Plumas 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*)

Direct and Indirect Effects

Over-snow vehicle use in the Plumas 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 OSV use and grooming activities. Since there are no known winter roosts in the Plumas, 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 are no known bat hibernacula but disturbance of individuals could occur if an OSV use area is near any sites. Disturbance of individuals during certain times of the year can cause undue stress which can reduce survival rate. 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).

The minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are 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 Plumas 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 - modified, 3, 4, or 5, include vegetation management projects, fire salvage projects, firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Vegetation management and salvage projects identified above are very small in comparison to the OSV Use Designation action area and/or do not overlap with groomed and ungroomed OSV routes or staging areas where the highest OSV use occurs.

Townsend's big-eared bat habitat also overlaps with areas open to Christmas tree cutting and firewood cutting. 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 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 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 Plumas 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*)

The Pacific Southwest Region of FWS has recently updated their regional recommendations for buffers around eagle nests, making them more in line with national guidelines (Dec 2017). The U.S. Fish and Wildlife Service has national guidelines for management of bald eagles including recommended no-disturbance buffers around bald eagle nests (U.S. Fish and Wildlife Service National Bald Eagle Management Guidelines 2007). Bald eagle nesting sites in California and Nevada may require larger no-disturbance buffer zones than recommended in the national guidelines when local jurisdictions recommend larger buffers, when nests are located in remote or arid areas, or when intensity or duration of human activities are above normal conditions; e.g. when a nest draws high levels of public interest a larger buffer may be appropriate. USFWS National Bald eagle guidelines (2007) recommend “in open areas, where there is increased visibility and exposure to noise, this distance should be extended to 660 feet.”

The 1988 Plumas National Forest Land and Resource Management Plan developed a prescription specific to the Bald Eagle Habitat Prescription, including general direction and standards and guidelines (USDA Forest Service 1988, pp.4-96 – 4-98). This prescription applies to occupied and potential bald eagle habitat to encourage species recovery. These areas consist of (1) historical nesting territories, (2) suitable habitat for population expansion, and (3) foraging and roosting habitat. Site-specific direction is in the Management Area Direction (of the Forest Plan).

The general direction for bald eagle habitat limits recreation use in bald eagle habitat, and identifies standards and guidelines that close the areas to ORV use and preclude development of recreation facilities with nesting territories (Ibid, p. 4-96). “ORV” is defined as “Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice, marsh, swampland, or other natural terrain.” (Plumas National Forest EIS for LRMP, Glossary, Definitions, p.29). The Bald Eagle Habitat Prescription applies to occupied and potential bald eagle habitat to encourage species recovery.

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 46.

Table 46. Resource indicators and measures for assessing effects to bald eagles

Resource Indicator and Effect	Measure	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from noise and increased human presence, injury or mortality of individuals	Acres of Primary Use Areas overlapping designated OSV areas	7,461	493	2	10,457	115

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. Noise disturbance is another disturbance factor for roosting eagles which can cause undue stress on individuals. Eagle Primary Use Areas are often located adjacent to meadows and frozen water bodies which are both very popular with OSV recreationists. A winter roost area is located near Lake Davis, this area is included in the analysis. OSV proposed actions would not physically modify any suitable bald eagle habitat within the project area.

Comparison of Alternatives

Table 47 and table 48 show and compare, by alternative, the number of bald eagle Primary Use Areas within moderate and high habitats, and distance from OSV-use areas; and the amount of buffered bald eagle Primary Use Areas and reproductive habitat, respectively, with the potential for direct and indirect effects (disturbance, injury, or mortality) from OSV use and related activities.

A total of 65 Primary Use Areas are located within the Plumas National Forest. The potential for OSV-related impacts to bald eagle, including noise-based disturbance or injury/mortality, would be most likely to occur in those primary use areas that are open to and conducive to OSV use. In addition, high OSV use is concentrated within 0.5 mile of snowmobile staging areas, on and within 0.5 mile of groomed trails, and in meadows within 0.5 mile of a designated OSV trail, so the majority of OSV use occurs within in an even smaller percentage of the habitat. All alternatives are in compliance with the Plumas Forest Plan.

Table 47. Number of bald eagle Primary Use Areas within moderate and high OSV-use areas

Alternatives	Within moderate OSV-use areas	Within high OSV-use areas
1	11	4
2	23	5
3	17	9
4	15	23
5	17	9

There are 4 Primary Use Areas that are located within high OSV-use areas under alternative 1, with 5 Primary Use Areas under alternative 2 - modified, 9 Primary Use Areas under alternatives 3 and 5, and 23 Primary Use Areas under alternative 4. There are 16 Primary Use Areas within 660 feet of OSV-use areas under alternative 1, with 26 Primary Use Areas under alternative 2 - modified and 5, and 31 Primary Use Areas under alternative 3.

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 Primary Use Areas to determine whether or not disturbance is occurring and if changes in management are necessary. Therefore, bald eagle Primary Use Areas are not expected to be impacted under the current condition. 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 alternatives 4, and 5, primary use areas (67 percent and 64 percent, respectively) have the potential to be impacted by OSV use as alternative 1 (68 percent). Under alternative 2 - modified, primary use areas (55 percent) has the potential to be impacted by OSV use, and alternative 3 has the least potential to be impacted by OSV use at 36 percent.

Table 48. Acres of high-value bald eagle primary use areas by alternative

	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Open to OSV use	21,307	4,060	2,245	13,734	3,956
Not designated for OSV use	7,102	15,561	3,907	14,675	2,196
Total acres of bald eagle primary use areas	28,409	19,711	6,152	28,409	6,152
Open to OSV use and conducive to OSV use	5,833	4,060	2,245	5,815	3,956
Not designated for OSV use but conducive to OSV use	2,802	3,280	3,907	2,820	2,196
Total acres conducive to OSV use	8,635	7,340	6,152	8,635	6,152

Cumulative Effects

Based upon spatial data provided by the Plumas National Forest, past, present, and foreseeable future actions that could result in a cumulative impact to bald eagles, when combined with alternatives 1, 2 - modified, 3, 4, or 5, include firewood cutting, Christmas tree cutting, non-motorized winter recreational activities, or use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. Bald eagle habitat overlaps with areas open to Christmas tree cutting and firewood cutting. 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 all alternatives. 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. 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 - modified, 3, 4, and 5 of the Plumas 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.
- Forest would use the results of ongoing inventory and monitoring of bald eagle Primary Use Areas to determine whether or not disturbance is occurring and if changes in management are necessary, thereby minimizing impacts to bald eagle.
- 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.

Willow Flycatcher (*Empidonax trailii*)

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. 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).

The minimum cross-country snow depth of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to be adequate to protect aquatic and riparian habitats from measurable impacts to water quality (McNamara 2016). Table 49 shows the acres of suitable willow flycatcher habitat by alternative.

Table 49. Acres of suitable willow flycatcher habitat by alternative

	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Acres Open to OSV use	683	2,612	2,093	3,307	2,154
Acres Not designated for OSV use	5,827	2,516	2,020	3,203	1,959
Total acres of willow flycatcher habitat ²⁰	6,510	5,128	4,113	6,510	4,113
Acres Open to OSV use and conducive to OSV use	2,304	2,602	1,667	2,338	1,703
Acres Not designated for OSV use but conducive to OSV use	1,708	1,318	1,447	1,674	1,411
Total acres conducive to OSV use	4,012	3,920	3,114	4,012	3,114

Cumulative Effects

None; the Plumas 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 Plumas National Forest Over-snow Vehicle Use Designation Project would impact the willow flycatcher or its habitat 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.

²⁰ Total acres of willow flycatcher habitat is the sum of high and moderate nesting habitat, and foraging habitat.

- OSV use has not been identified as a factor in meadow degradation for this species, and the minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5 and 18 inches for alternative 3, are expected to protect meadow and riparian habitats from measurable impacts to water quality or vegetation.

Terrestrial Invertebrates

Western Bumble Bee (*Bombus occidentalis*)

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 depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to be adequate to protect vegetation from measurable impacts (McNamara 2016).

OSV use and grooming of OSV trails can damage vegetation through direct contact with plant tissues that are present above the snow or within the snow column that is compacted by the vehicles. Because woody species (trees, shrubs, and sub-shrubs) are the only plants present within the snow, they are the only plants that are likely to be directly damaged. All other plant life forms are not expected to be directly affected by OSV use because adequate snow requirements and minimum snow depths are expected to prevent direct effects to vegetation at ground level (Davidson 2018).

It is generally recognized that disturbance to soil and vegetation by OSV use is reduced as snowpack depths increase. Cole et al (2019) found bumble bee occupancy increased with greater flowering plant richness, more forb cover and less shrub cover. Damage to soil and low-growing vegetation is much more likely when OSV use occurs under low snow conditions (Greller et al. 1974, Fahey and Wardle 1998) (Davidson 2018).

Cumulative Effects

None; the Plumas 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 Plumas National Forest Over-snow Vehicle Use Designation Project would impact the western bumble bee or its habitat 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 the queen burrows under duff under trees and on steeper slopes where OSV use does not occur (refer to OSV-use assumptions).
- It is generally recognized that disturbance to soil and vegetation by OSV use is reduced as snowpack depths increase, OSV use is not expected to degrade terrestrial habitat based upon minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3.

Terrestrial Wildlife Species of Public Interest

Table 50 shows an additional terrestrial species of interest identified during public scoping.

Table 50. Additional terrestrial species of interest identified during public scoping

Species Name	Threatened, endangered, proposed, candidate, and sensitive status	Project Area Within Species' Range	Detections in or Near the Project Area	Suitable Habitat Present	Species Addressed Further/Rationale
Mule deer (<i>Odocoileus hemionus</i>)	MIS	Yes	Yes	Yes	Yes/Addressed in this report with respect to impacts associated with winter range. Otherwise, addressed as a MIS in the project MIS report.

Mule Deer (*Odocoileus hemionus*)

Mule deer are considered a management indicator species for oak-associated hardwood and hardwood conifer in the Sierra Nevada bioregion. Table 51 shows the resource indicators and measures for assessing effects to mule deer on winter ranges.

Potential effects to mule deer on their winter range was identified as a non-significant issue during public scoping. Please refer to the Management Indicator Species section for mule deer population status and trend, habitat status and trend, and project-level habitat impacts.

Table 51. Resource indicators and measures for assessing effects to mule deer on winter range

Resource Indicator and Effect	Measure	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals, or habitat modification (i.e., altered movement due to OSV use)	Acres of winter range affected by OSV use	117,433	208	656	117,652	1

Species Account

Mule deer range and habitat includes coniferous forest, foothill woodland, shrubland, grassland, agricultural fields, and suburban environments (CDFW 2014). Many mule deer migrate seasonally between higher-elevation summer range and low-elevation winter range (Ibid). On the west slope of the Sierra Nevada, oak-associated hardwood and hardwood/conifer areas are an important winter habitat (CDFW 1998).

Mule Deer Habitat Status

Plumas National Forest contains 232,607 acres of mule deer winter range, with 21,330 (9 percent) acres conducive to OSV use.

Direct and Indirect Effects

The cumulative effects of roads and recreation trails on mule deer and elk should be assessed during winter when disturbance has the potential to be the most detrimental (Canfield et al. 1999 in Gaines et al 2003). This means evaluating the effects of roads, ski trails, and snowmobile routes on the winter ranges for these species.

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 (Gaines et al 2003). Based upon Freddy et al. (1986), the distance at which mule deer have been shown to be displaced by OSVs is 133 meters (436 feet).

Snowmobile use within mule deer winter range can have the following direct effects on individual mule deer or their habitat (Gaines et al. 2003): (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; and (3) potential for injury or mortality to individuals from vehicle collision. Potential indirect effects include altered or dispersed movement as caused by a route or human activities on or near a route.

Table 52 displays the amount of deer winter range, by alternative, with the potential for direct (disturbance and vehicle collision) and indirect (habitat modification) effects as described above. 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 miles per hour). There is an increased likelihood of collision with OSVs due to higher frequency of OSV use and higher speeds. Vehicle collision with a mule deer would negatively affect the individual, but the likelihood of occurrence is assumed to be rare.

Table 52. Acres of mule deer winter range with potential to be impacted by OSV use and related activities

	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Open to OSV use	117,433	208	656	117,652	1
Not designated for OSV use	115,174	92,777	23,628	114,955	24,283
Total acres of mule deer winter range	232,607	92,985	24,284	232,607	24,284
Open to OSV use and conducive to OSV use	21,330	15	135	21,334	0
Not designated for OSV use but conducive to OSV use	20,147	30,736	9,458	20,143	9,593
Total acres conducive to OSV use	41,477	30,751	9,593	41,477	9,593

Over snow-vehicle use of existing linear routes and cross-country travel is allowed within winter range, at some level, under all alternatives. Under the current condition (alternative 1), 232,607 acres (50 percent) of mule deer winter range is closed to OSV use. Therefore, deer using that portion of winter range would not be impacted by authorized OSV use. Roughly 50 percent of winter range is open to OSV use. However, only 21,330 acres or 51 percent of winter range are open to and conducive to OSV use (slopes less than 20 percent and canopy cover less than 70 percent). The amount of winter range with potential for impacts would be the same under alternative 4. It would be substantially less under alternative 2 - modified (0.04 percent), alternative 3 (1.4 percent), and alternative 5 (0 percent).

Summary

Approximately 50 percent of mule deer winter range is not designated for OSV use under alternative 1.

Following are the amounts of mule deer winter range that are designated for and conducive to OSV use under each of the alternatives: alternative 1, 51 percent; alternative 2 - modified, 0.04 percent; alternative 3, 1.4 percent; alternative 4, 51 percent; and alternative 5, 0 percent.

Climate Change

Temperature changes associated with changing climate are expected to result in the following general changes to mammals, birds, reptiles and amphibians. Increased temperatures due to climate change may directly affect birds by forcing them to use more energy for thermoregulation that can disrupt maintenance, reproduction, timing of breeding and migration, and reduce survival or fitness. Birds may respond to these costs by shifting their ranges over time to areas with more suitable thermal conditions, but habitat and other resources may be insufficient or unsuitable for their needs. (King and Finch 2013)

Some mammals have very specific climatic adaptations, such as requirements for snow or temperatures within a narrow range (e.g., hibernation). Some have distributions that are dependent on climate. Most mammals will not be able to avoid the effects of climate change, with both positive and negative effects possible. Places to hide, forage, drink, and breed are distinct and may change seasonally. As a result, there are many opportunities for climate change to disrupt mammalian life histories. Most mammals are also highly mobile and have relatively short (generally less than 20 years) life spans, so if climates become unsuitable, mammalian response can be expected to be rapid. Mammals play dominant roles in many systems and make up most of the terrestrial large-bodied predators in North America. Large, high-trophic mammals have significant impacts on the ecosystems they inhabit. Rodents and lagomorphs (hares, pikas, and rabbits), the primary prey for many mammalian and avian predators can affect the composition of vegetative communities through seed predation. Small terrestrial mammals, including rodents and insectivores, including shrews, typically comprise the largest and most diverse group of mammals in many

ecosystems. Therefore, most of the changes in mammal abundances and distributions resulting from climate change are expected to be in this group. (McKelvey et al. 2013)

Climate change may alter habitats and increase fragmentation in aquatic habitats impacting aquatic species such as turtles and amphibians that are sensitive to changes in water availability and its thermal properties. In addition, turtles have temperature-sensitive sex determination: cooler temperatures may produce nests of only males; warmer temperatures may produce nests of only females. Temperature changes in a local area may have the effect of altering the sex ratios of populations - potentially affecting future reproduction and over time compromising their evolutionary fitness. (Olson and Saenz 2013).

Management activities that focus on landscape connectivity, diversity, and resilience may help reduce stresses on wildlife species that could be compounded by changes to climate (King and Finch 2013, McKelvey et al. 2013). For reptiles, maintenance and restoration of existing habitats and management actions that reduce environmental stressors are important management considerations with respect to climate change (Olson and Saenz 2013).

Degree to Which the Alternatives Address the Issues and Summary of Environmental Effects

Table 53. Summary comparison of how the alternatives address the key issues and environmental effects for federally listed species, Forest Service sensitive species, and species of public interest

Resource Indicator and Effect ²¹	Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Potential for noise-based disturbance or injury or mortality ²² to individuals; or snow compaction effects from OSV use and related activities	Acres of buffered California spotted owl (CSO) PACs with potential to be impacted by OSV use	47,419	37,253	14,666	7,317	15,935
	Acres of CSO suitable habitat with potential to be impacted by OSV use	558,271	109,792	77,765	138,297	83,861
	Acres of buffered northern goshawk (goshawk) PACs with potential to be impacted by OSV use	6,887	5,203	2,314	6,983	2,474
	Acres of goshawk suitable habitat with potential to be impacted by OSV use	731,289	524,484	345,308	740,239	156,121
	Acres of buffered bald eagle Primary Use Areas with potential to be impacted by OSV use	848	173	122	483	674
	Acres of bald eagle reproductive habitat with potential to be impacted by OSV use	21,037	4,060	2,245	13,734	3,956

²¹ The percentage of habitats impacted would actually be lower considering the following: the concentration of OSV use is not equal across the landscape or most species, the potential for noise-based disturbance would only overlap with the early part of the 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. In addition, the Forest would use the results of ongoing inventory and monitoring and research to determine whether or not disturbance is occurring and if changes in management are necessary, thereby minimizing impacts to species.

²² Under all alternatives, the potential for injury or mortality to individual animals from OSVs or grooming equipment is low to very low for all species considered.

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Resource Indicator and Effect²¹	Measure	Alternative 1	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Potential for noise-based disturbance or injury or mortality to individuals; habitat fragmentation; or snow compaction effects ²³ from OSV use and related activities	Acres of marten winter habitat with potential to be impacted by OSV use	349,156	305,337	257,864	352,150	283,415
Potential for loss of habitat connectivity	Acres of marten connectivity habitat with potential to be impacted by OSV use	98,931	77,892	61,470	99,187	62,210
Potential for disturbance to individuals from OSV use and increased human presence, injury or mortality of individuals, or habitat modification (i.e., altered movement due to OSV use)	Acres of gray wolf range affected by OSV use	21,330	30,751	9,593	41,477	9,593
Potential for noise-based disturbance or habitat degradation from OSV use and related activities	Qualitative assessment for fringed myotis, pallid, and Townsend's big-eared bats	Under all alternatives: individuals that emerge to forage during warmer weather could experience missed feeding when snow grooming activities occur during the early evening; 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				
Potential for habitat degradation from OSV use and related activities	Migratory species and species that hibernate (willow flycatcher and western bumble bee)	The minimum cross-country snow depths of 12 inches for alternatives 1, 2 - modified, 4, and 5, and 18 inches for alternative 3, are expected to protect meadow, riparian, wetland, and moist bottomland habitats from measurable impacts to water quality or vegetation.				

²³ Reduced route densities, under alternatives 2, 3, and 4, are likely to reduce the potential for impacts to subnivean prey species.

Compliance with LRMP and Other Relevant Laws, Regulations, Policies and Plans

Table 54. Compliance with LRMP and other Relevant Laws, Regulations, Policies, and Plans

Type	Direction	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Plumas National Forest LRMP						
Desired Future Condition		Meets for all species	Would meet for all species	Would meet for all species	Would meet for all species	Would meet for all species
Forest Goals	<ul style="list-style-type: none"> Maintain habitat to support viable populations of all native and desired non-native vertebrate species. Provide habitat leading to viable populations of endangered species. Improve and protect habitat for designated emphasis and harvest species. Provide diversity of plant and animal communities and tree species by assuring the continuous and viable presence of all seral stages of all native plant communities occurring in the forest. 	Meets for all species	Would meet for all species	Would meet for all species	Would meet for all species	Would meet for all species
Forest Standards and Guidelines	<ul style="list-style-type: none"> Standards and guidelines outlined in the Plumas National Forest Land and Resource Management Plan for wildlife have been superseded by the Sierra Nevada Framework (see below) 	Meets for all species	Would meet for all species	Would meet for all species	Would meet for all species	Would meet for all species

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Type	Direction	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Sierra Nevada Forest Plan Amendment						
Management Goals and Strategies	<p>Goals: The broad goals of the old forest and associated species conservation strategy are to:</p> <p>1) 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;</p> <p>2) Increase the frequency of large trees, increase structural diversity of vegetation, and improve the continuity and distribution of old forests across the landscape; and</p> <p>3) Restore forest species composition and structure following large scale, stand-replacing disturbance events.</p>	Meets old forest ecosystem species habitat needs with respect to habitat composition and structure	Would meet old forest ecosystem species habitat needs with respect to habitat composition and structure	Would meet old forest ecosystem species habitat needs with respect to habitat composition and structure	Would meet old forest ecosystem species habitat needs with respect to habitat composition and structure	Would meet old forest ecosystem species habitat needs with respect to habitat composition and structure
Strategy: The old forest ecosystem strategy	<p>Strategy: The old forest ecosystem strategy has the following key elements:</p> <ul style="list-style-type: none"> * A network of land allocations, including CSO and goshawk PACs, CSO HRCAs, 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. * 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. 	Meets old forest ecosystem species habitat needs with respect to habitat composition and structure	Would meet old forest ecosystem species habitat needs with respect to habitat composition and structure	Would meet old forest ecosystem species habitat needs with respect to habitat composition and structure	Would meet old forest ecosystem species habitat needs with respect to habitat composition and structure	Would meet old forest ecosystem species habitat needs with respect to habitat composition and structure

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Type	Direction	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Land Allocations and Desired Conditions	California Spotted Owl PACs	Meets designation, desired condition and intent for habitat conditions	Would meet designation, desired condition and intent for habitat conditions	Would meet designation, desired condition and intent for habitat conditions	Would meet designation, desired condition and intent for habitat conditions	Would meet designation, desired condition and intent for habitat conditions
	Northern Goshawk PACs	Meets designation, desired condition and intent for habitat conditions	Would meet designation, desired condition and intent for habitat conditions	Would meet designation, desired condition and intent for habitat conditions	Would meet designation, desired condition and intent for habitat conditions	Would meet designation, desired condition and intent for habitat conditions
	Great Gray Owl PACs	NA: Currently no verified great gray owl observations on Forest	NA: Currently no verified great gray owl observations on Forest	NA: Currently no verified great gray owl observations on Forest	NA: Currently no verified great gray owl observations on Forest	NA: Currently no verified great gray owl observations on Forest
	Forest Carnivore Den Site Buffers	NA: Currently no known fisher or marten den sites on Forest	NA: Currently no known fisher or marten den sites on Forest	NA: Currently no known fisher or marten den sites on Forest	NA: Currently no known fisher or marten den sites on Forest	NA: Currently no known fisher or marten den sites on Forest
	California Spotted Owl HRCAs	Meets designation and desired condition for habitat conditions	Meets designation and desired condition for habitat conditions	Meets designation and desired condition for habitat conditions	Meets designation and desired condition for habitat conditions	Meets designation and desired condition for habitat conditions
Forest-wide Standards and Guidelines	27. Minimize old forest habitat fragmentation. Assess potential impacts of fragmentation on old forest associated species (marten) in biological evaluations.	Meets: alternative 1 maintains forest structure	Meets: alternative 2 - modified would maintain forest structure	Meets: alternative 3 would maintain forest structure	Meets: alternative 4 would maintain forest structure	Meets: alternative 5 would maintain forest structure

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Type	Direction	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Forest-wide Standards and Guidelines (continued)	28. Assess the potential impact of projects on the connectivity of habitat for old forest associated species.	Meets: alternative 1 maintains forest structure habitat connectivity	Meets: alternative 2 - modified would maintain forest structure and habitat connectivity	Meets: alternative 3 would maintain forest structure and habitat connectivity	Meets: alternative 4 would maintain forest structure and habitat connectivity	Meets: alternative 5 would maintain forest structure and habitat connectivity
	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.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.
	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.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives.
	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.	Meets/would meet for all alternatives	Meets/would meet for all alternatives	Meets/would meet for all alternatives	Meets/would meet for all alternatives	Meets/would meet for all alternatives

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Type	Direction	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Forest-wide Standards and Guidelines (continued)	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 would continue.	Meets	Would meet	Would meet	Would meet	Would meet
	75. For California spotted owl PACs: Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately 0.25 mile of the activity center during the breeding season (March 1 through August 31), unless surveys confirm that California spotted owls are not nesting.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives
	76. For northern goshawk PACs: Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately 0.25 mile of the Primary Use Areas during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting.	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No vegetation management is proposed under any of the alternatives
	77. The [CSO or goshawk] 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 Primary Use Area would be shielded from planned activities by topographic features that would minimize disturbance, the LOP buffer distance may be modified.	NA	NA	NA	NA	NA

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Type	Direction	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Forest-wide Standards and Guidelines (continued)	82. Mitigate impacts where there is documented evidence of disturbance to the [CSO or goshawk] Primary Use Area 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 Primary Use Areas.	Meets	Would meet	Would meet	Would meet	Would meet
	83. Apply a limited operating period, prohibiting vegetation treatments and road construction within 0.25 mile of an active great gray owl nest stand, during the nesting period (typically March 1 to August 15).	Meets/would meet for all alternatives: No known GGO nests and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known GGO nests and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known GGO nests and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known GGO nests and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known GGO nests and no vegetation management is proposed under any of the alternatives
	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.	Meets/would meet for all alternatives: No known fisher den sites and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known fisher den sites and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known fisher den sites and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known fisher den sites and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known fisher den sites and no vegetation management is proposed under any of the alternatives

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Type	Direction	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Forest-wide Standards and Guidelines (continued)	87 and 89. Mitigate impacts where there is documented evidence of disturbance to the [fisher or marten] 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.	Meets/would meet for all alternatives: No known fisher or marten den sites	Meets/would meet for all alternatives: No known fisher or marten den sites	Meets/would meet for all alternatives: No known fisher or marten den sites	Meets/would meet for all alternatives: No known fisher or marten den sites	Meets/would meet for all alternatives: No known fisher or marten 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.	Meets/would meet for all alternatives: No known marten den sites and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known marten den sites and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known marten den sites and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known marten den sites and no vegetation management is proposed under any of the alternatives	Meets/would meet for all alternatives: No known marten den sites and no vegetation management is proposed under any of the alternatives
Federal Law						
Endangered Species Act	It is Forest Service policy to analyze impacts to threatened and endangered species to ensure management activities are not likely to jeopardize the continued existence of a threatened or species, or result in the destruction or adverse modification of critical habitat for these species.	Meets	Would meet	Would meet	Would meet	Would meet
Bald Eagle Protection Act	Prohibits, except under certain specified conditions, the taking (pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb ²⁴), possession and commerce of such birds.	Meets: Is not resulting in the taking of bald eagles	Would Meet: Would not result in the taking of bald eagles	Would Meet: Would not result in the taking of bald eagles	Would Meet: Would not result in the taking of bald eagles	Would Meet: Would not result in the taking of bald eagles

²⁴ 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.

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Type	Direction	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Forest Service Manual (2670)						
	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.	Meets for all species	Would meet for all species	Would meet for all species	Would meet for all species	Would meet for all species
	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.	Meets for all species	Would meet for all species	Would meet for all species	Would meet for all species	Would meet for all species
	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.	Meets	Meets	Meets	Meets	Meets
	2672.41 – Objectives of the Biological Evaluation:	Meets	Meets	Meets	Meets	Meets
	2672.42 – Standards for Biological Evaluations	Meets	Meets	Meets	Meets	Meets

Management Indicator Species

See the Management Indicator Species Report for a full description on species that would or would not be either directly or indirectly affected by this project.

Migratory Landbirds

Under the National Forest Management Act, 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 Plumas 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 December 26 and March 31 which predominately avoids overlap with the active breeding season for most migratory bird species. The BA, BE, and MIS reports found that the Plumas OSV project would not cause adverse effects (BA), would not cause a trend towards 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 Plumas 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.

Aquatics

This analysis will consider and disclose potential effects to aquatic resources that could result from the following proposed actions including designating trails and cross-country areas for OSV use under subpart C of the Forest Service's Travel Management regulations (36 CFR part 212). The focus is on impacts to aquatic animal species of management concern and their habitat that may result from the use of OSVs as described in the alternatives.

This section describes the area affected by the alternatives and existing resource conditions within watersheds where aquatic species and their habitats overlap with OSV use. Hydrology and aquatic resource measurement indicators are used to describe the existing conditions for watersheds within the analysis area and for analysis to compare, quantify, and describe how each alternative addresses resource concerns as they pertain to aquatic resources. The analysis includes all aquatic resources that could be affected by OSVs. This includes species of concern occurring, in part, within perennial and seasonal streams, lakes, ponds, meadows, and springs.

Methodology and Information Sources

This quantitative analysis used relevant GIS data layers from the Forest Service and other resource agencies. GIS layers of proposed designated OSV cross-country areas and trails under Forest Service jurisdiction were overlain with aquatic resource data layers to identify areas of potential effects within the project area, which was defined as the Plumas National Forest boundary. All GIS analyses were conducted using ArcGIS software version 10.5.1.

Water features (e.g., streams, springs, ponds, lakes, wetlands or marshes) were delineated using the U.S. Geological Survey's National Hydrography and the U.S. Fish and Wildlife Service's National Wetland Inventory datasets. Meadows occurring in the project area were delineated using a corporate dataset originally derived from the University of California at Davis. Project area elevations were derived from a U.S. Geological Survey seamless digital elevation model with 10 meter resolution. None of these datasets used were verified in the field.

To determine what federally listed or sensitive aquatic animal species may occur in the project area or be affected by the project, we reviewed relevant management documents (e.g., USFS 1991, 2004, 2014a, 2017), natural resource agency websites and databases (e.g., California Department of Fish and Wildlife's California Natural Diversity Database), and monitoring data stored in the Forest Service's Natural Resource Management databases (accessed or re-accessed on May 14, 2018). We also obtained an official list of federally threatened, endangered, and proposed species lists for the Plumas National Forest Over-snow Vehicle Use Designation Project from the Reno Fish and Wildlife Office (Consultation Code: 08ENVD00-2018-SLI-0480) and Sacramento Fish and Wildlife Office (Consultation Code: 08ESMF00-2018-SLI-2052) using the Plumas National Forest boundary through the U.S. Fish and Wildlife Service Environmental Conservation Online System Information for Planning and Consultation [IPAC] website (<https://ecos.fws.gov/ipac/>) on May 8, 2018. The official lists from the U.S. Fish and Wildlife Service offices identified aquatic species to consider because they may be present within the Plumas National Forest or may be affected by the project's alternatives.

Occupancy data for federally listed and Forest Service sensitive species in the project area were downloaded from the Forest Service Natural Resource Information System database (i.e., NRIS AqS). Additional occupancy data were obtained from the California Natural Diversity Database. Occupancy data were obtained from these databases during July 2018. For species that have been observed or are assumed to occur in the project area, suitable and critical (if designated for federally listed species) habitat

data were obtained from the Plumas National Forest or the U.S. Fish and Wildlife Service, respectively. If suitable habitat data were not available, potentially suitable habitat was modeled using information contained in the scientific literature and the aforementioned environmental datasets. Definitions of species-specific suitable habitat was presented within the Affected Environment and Existing Condition section below. The number of stream or shoreline miles (fish) or total acreage (amphibians and reptiles) of occupied, suitable, and/or critical habitat occurring in the project alternatives' effect boundaries were quantified separately for each species within their native range.

The species and critical habitat listed in table 55 and table 56, respectively, were determined to occur the project area. Species that are known or suspected to be absent in the project area were not analyzed for project-related effects. For example, Delta smelt (*Hypomesus transpacificus*) and Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) were identified in the official list of federally threatened, endangered, and proposed species, but have been eliminated from further analysis based on the species' absence and lack of designated critical habitat in the Plumas. Federally listed species that may be affected by the preferred alternative are also analyzed in more detail within the biological assessment to ensure compliance with the Endangered Species Act.

Table 55. Threatened, endangered, proposed, and sensitive aquatic animal species present within the project area boundary (forest boundary) and considered for effects analysis

Species	Status
Amphibians	
California red-legged frog (<i>Rana draytonii</i>)	Federally Threatened
Sierra Nevada yellow-legged frog (<i>Rana sierrae</i>)	Federally Endangered
Foothill yellow-legged frog (<i>Rana boylei</i>)	Forest Service Sensitive
Reptiles	
Western pond turtle (<i>Actinemys marmorata</i>)	Forest Service Sensitive
Fishes	
Hardhead (<i>Mylopharodon conocephalus</i>)	Forest Service Sensitive

Table 56. Threatened, endangered, and proposed federally listed aquatic animal species' designated or proposed critical habitat considered for effects analysis

Species	Critical Habitat Status
California red-legged frog (<i>Rana draytonii</i>)	Final Designated
Sierra Nevada yellow-legged frog (<i>Rana sierrae</i>)	Final Designated

Resource Indicators and Measures

A total of three indicators and eight measures were used in this report to document the potential effects of the project alternatives on aquatic resources (table 57).

Table 57. Aquatic species resource indicators and measures for assessing effects

Resource Element	Resource Indicator	Measure
Aquatic species	Potentially Suitable Habitat (PSH)	PSH within cross-country OSV-use areas (acres ¹) - amphibians and reptiles
Aquatic species	Potentially Suitable Habitat (PSH)	PSH within cross-country OSV-use areas (miles ²) - fish
Aquatic species	Potentially Suitable Habitat (PSH)	PSH in proximity to designated OSV routes (acres) - amphibians and reptiles
Aquatic species	Potentially Suitable Habitat (PSH)	PSH in proximity to designated OSV routes (miles) - fish
Aquatic species	Potentially Suitable Habitat (PSH)	OSV stream crossings within PSH
Aquatic species	Designated Critical habitat (DCH)	DCH within cross-country OSV-use areas (acres) - California red-legged frog and Sierra Nevada yellow-legged frog
Aquatic species	Designated Critical habitat (DCH)	DCH in proximity to designated OSV routes (acres) - California red-legged frog and Sierra Nevada yellow-legged frog
Aquatic species	Designated Critical habitat (DCH)	OSV stream crossings within DCH
Aquatic species	Critical Aquatic Refuges (CAR)	CAR within cross-country OSV-use areas (acres)
Aquatic species	Critical Aquatic Refuges (CAR)	CAR in proximity to designated OSV routes (acres)
Aquatic species	Critical Aquatic Refuges (CAR)	OSV stream crossings within CARs.

¹ Acres = aquatic and terrestrial acres; ² Miles = stream miles

In the aquatics resources analysis, we also reviewed the proposed action (alternative 2 – modified) and alternatives in sufficient detail to determine the level of effect that would occur to federally listed and Forest Service sensitive species. One of three possible determinations was chosen for federally listed or Forest Service sensitive species based on the available literature, an analysis of the potential effects of the project, and the professional judgment of the biologists who completed the evaluation. The determinations for federally listed or sensitive aquatic animal species were determined by accounting for both the magnitude and extent of the effects from OSV use that will likely occur within suitable or occupied habitats.

The three possible determinations for Forest Service sensitive species (from FSM 2672.42) are:

1. “No impact” – where no impact is expected;
2. “May affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area” – where impacts are expected to be immeasurable or extremely unlikely; and
3. “May affect individuals, and is likely to result in a trend toward Federal listing or loss of viability in the planning area” – where impacts are expected to be detrimental and substantial.

The three possible determinations for species federally listed as threatened or endangered or their designated critical habitat are:

1. “No effect” – proposed action is not expected to affect listed species or critical habitat;
2. “May affect, not likely to adversely affect” – effects on listed species or critical habitat are expected to be discountable, insignificant, or completely beneficial;
3. “May affect, likely to adversely affect” – adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial.

Incomplete and Unavailable Information

The primary limitations associated with analyzing the effects of OSV use on aquatic species and their habitats are: (1) the effects in general are not well understood because very little research has been conducted on the topic, and (2) no over-snow vehicle research has been conducted on the specific species being evaluated in this section. As a result, it is difficult to quantify the effect of OSV use (e.g., snow compaction, vehicle emissions, etc.) on aquatic resources. Furthermore, there does not appear to have been any OSV-related monitoring conducted within the Plumas National Forest. Therefore, our assessment of impacts from OSV use on aquatic species and their habitats were based on the location of proposed designated OSV-use areas, limited monitoring and scientific studies conducted in other locations, life history elements, and professional judgement.

Spatial and Temporal Context for Effects Analysis

The spatial boundary for analyzing the direct and indirect effects to aquatic resources is the project area boundary (Forest boundary) because all expected effects relevant to this resource would occur and remain within this area. The spatial effect boundary of designated cross-country OSV-use areas were defined as the boundaries of those areas. However, the spatial effect boundary of designated OSV trails was confined to within 100 feet on both sides of the trails. The general 100-foot effect boundary on each side of the trails was chosen using relevant scientific literature (Forman and Alexander 1998; Olliff et al. 1999; Baker and Buthmann 2005; Gage and Cooper 2009) and professional judgment to capture the majority of foreseeable direct and indirect effects (e.g., pollution and alterations in hydrology) of the project alternatives on aquatic animals within the project area.

Effects to aquatic species or their habitats would be expected to occur or become evident within one year post disturbance and this constitutes short-term effects. Effects that could be observed after one year were considered long-term effects. Long-term effects become increasingly difficult to predict due to unknown interactions among other environmental drivers and perturbations.

Cumulative Effects Boundaries

Because effects from the proposed activities would interact with effects from other ongoing or future projects only within the project area, the cumulative effects boundary is also the project area boundary. The project area boundary is the National Forest boundary for the Plumas National Forest 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 ten 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.

Chapter 3 and appendix G 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 Environmental Impact Statement 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 effects 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.

Assumptions Specific to the Aquatic Resources Analysis

1. The use of OSVs is more concentrated along designated trails, and thus, effect magnitude is higher.
2. We assumed that snow depth has an inverse sigmoidal relationship to the majority of potential effects from OSV use within designated areas.
3. Lower elevations (less than 4,000 feet) generally have lower OSV use – snow occurs at lower elevations less frequently and persists for shorter periods of time (e.g., 2 to 5 days).
4. Higher minimum snow depth requirements are likely negatively correlated with the amount of OSV use during a year because fewer days or locations may be available for authorized OSV use in designated areas.
5. Only authorized OSV uses were analyzed. In general, OSVs are not authorized to operate over bare ground or areas with inadequate snow depth that would cause resource damage as described in 36 CFR part 261.15. Concerns arising from unauthorized OSV uses will be regarded as law enforcement issues and may prompt corrective actions. Also, travel over bare soil is illegal, can cause damage to OSVs, and thus is generally avoided by operators. Therefore, unauthorized OSV use was assumed to be rare and was not considered in the aquatic resource analysis.
6. Indirect effects, such as those possibly resulting from snow compaction and vehicle emissions, are likely to be concentrated in the corridors along designated OSV trails (groomed or ungroomed) because OSV use is concentrated. These effects are assumed to occur within 100 feet of designated OSV trails and areas open to OSV use outside these concentrated use corridors are much less likely to experience measurable indirect effects.
7. For the purposes of this analysis, non-motorized uses or activities were assumed to have very little to no effect on aquatic environments and were not considered further for this analysis.
8. Future aquatic resource related monitoring may identify unexpected types or levels of impacts to aquatic resources, and may prompt corrective actions as warranted.

Topics and Issues Addressed in This Analysis

Purpose and Need

To protect aquatic resources, it is important to ensure OSVs are operated on adequate snow depths. As an integral part of the development and analysis of the alternatives, the minimization criteria at 36 CFR §212.55(b) described below, were used to compare and contrast alternatives as to how they would minimize damage to aquatic resources.

§ 212.55(b) Criteria for designation of roads, trails, and areas:

Specific criteria for designation of trails and areas in 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, and 5) incompatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.

Designating roads, trails and cross-country areas for OSV use has the potential to impact aquatic wildlife through direct/indirect or cumulative disturbance to individuals and aquatic wildlife habitats by:

- Causing injury or mortality to species through crushing (or other contact) or disturbance (e.g., noise resulting in interrupted or reduced breeding or feeding, increased stress leading to the depletion of energy stores, or alterations in movement patterns);
- Causing habitat destruction or modifications such as sedimentation, rutting, snow compaction of subnivean zones (i.e., the zone in and under the snow), or contamination of soils and water; and
- Broadening the zone of potential impacts by designating OSV-use areas rather than restricting OSV use to designated trails.

Snowmobiles, when operated cross-country instead of on designated trails, have the potential for more widespread impacts due to the potential for ground disturbance if there is inadequate snow cover (similar to summer motorized use), which may alter snowmelt patterns or cause increases in sedimentation. These potential effects are highly dependent on location, particularly areas of thin snow cover, and the amount and timing of use. Wet meadows, springs, seeps, fens, and bogs are particularly sensitive to physical disturbance where soft, organic soils lack resilience. The cross-country use of OSVs in these areas (without adequate snow cover) can lead to impacts including severely eroded soils and disrupted wetland ecosystems, as well as general habitat destruction and degraded water quality.

Affected Environment and Existing Condition

Federally Listed Species and Critical Habitat Information

California red-legged frog (*Rana draytonii*)

The California red-legged frog (*Rana draytonii*) is an endemic to California, listed as federally threatened (61 FR 25813), and considered a State Species of Special Concern by the California Department of Fish and Wildlife (CDFW 2018). The California red-legged frog Recovery Plan was released on September 12, 2002 (USFWS 2002; 67 FR 57830). The recovery objective is to reduce threats and improve the

population status of the California red-legged frog sufficiently to warrant de-listing. The strategy for recovery includes protecting existing populations by reducing threats, restoring and creating habitat that will be protected and managed in perpetuity, surveying and monitoring populations, conducting research on the biology of the species and threats to the species, and re-establishing populations of the species within the historic range. The southwestern portion of the Plumas National Forest falls within the Sierra Nevada Foothills and Central Valley recovery unit (recovery unit #1; USFWS 2002). The Feather River core area (core area #1) and Yuba River-South Fork Feather River core area (core area #2) are both partially within the administrative boundary of the Plumas National Forest. While the goal of the recovery plan is to protect the long-term viability of all existing populations within each recovery unit, recovery actions would be focused within, but not limited to, core areas (USFWS 2002).

Habitat and Life History

In the Sierra Nevada, the California red-legged frog historically occupied portions of the lower elevations west of the crest from Shasta County south to Tulare County (USFWS 2002). Almost all known California red-legged frog populations have been documented at elevations below about 3,500 feet with some historical sightings documented at elevations up to 5,200 feet (USFWS 2002). Suitable habitat above 3,500 feet in elevation may be more specific and may include such requirements as: quiet water refugia within 0.25 mile during high water flows, emergent vegetation present on a minimum of 25 percent of a pool or pond margin, and standing water that is retained into late July (USFWS 2002).

The California red-legged frog is generally found in or near water but may disperse away from water during or after rain storms (Bulger et al. 2003; Tatarian 2008), or in response to receding water during the driest time of year (USFWS 2002). Frogs may estivate in small mammal burrows and moist leaf litter up to 85 feet from water in dense riparian vegetation (61 FR 25813). This behavior occurs where the aquatic habitat is intermittent in nature. Bulger et al. (2003) found that upon onset of the winter wet season, non-migrating adults occupied terrestrial habitats up to approximately 420 feet from their aquatic site of residence until breeding activities commenced. Bulger et al. (2003) also found that during the wet season migrating adults may make short or long distance movements (650 feet to 1.7 miles) between aquatic sites with apparent disregard to topography or vegetation type within upland habitats up to approximately 1,600 feet from water. In apparent contrast to coastal populations which are rarely inactive, individuals from inland sites where temperatures are lower may become inactive for long periods (USFWS 2002; Tatarian 2008).

Breeding habitat for the California red-legged frog is typically characterized as ponds and stream pools with depths exceeding 2.3 feet and with overhanging vegetation such as willows, as well as emergent and submergent vegetation (Hayes and Jennings 1988). Breeding occurs during the months of November through March in most of their current range (USFWS 2002). Breeding in the Sierra Nevada may occur later due to freezing temperatures between November and February. Breeding would likely occur between March and May at higher elevations (Freel 1997, personal communication). The shrubby riparian vegetation including willows, cattails and bulrushes seems to be most suitable for California red-legged frogs (Hayes and Jennings 1988). However, California red-legged frogs have been found in less than ideal habitats and a combination of these factors is more important than an individual habitat component (Hayes and Jennings 1988). Small to medium perennial streams can also provide breeding habitat if the streams are not subjected to scouring flows during egg development. Streams in this category generally have the potential for deep pools and riparian vegetation to provide the habitat requirements for this frog. Emergent and overhanging vegetation is used as a brace for egg deposition and as cover by adult frogs. Permanent or nearly permanent pools are required for tadpole development, and adult frogs use emergent and overhanging vegetation as refugia. The amount of time to metamorphosis is highly dependent on temperature (Calef 1973). Tadpole development takes 11 to 20 weeks (Calef 1973). Water quality is also

very important. Adult frogs normally become sexually mature in two (males) to three (females) years and can live as long as ten years or more. Adults feed primarily on aquatic and terrestrial invertebrates, but large adults will eat small rodents such as deer mice (Jennings 1997, personal communication; USFWS 2002).

Critical Habitat

On March 17, 2010, the U.S. Fish and Wildlife Service finalized the designation of critical habitat for the California red-legged frog (75 FR 12816). Based on the above needs and the current knowledge of the life-history, biology, and ecology of the California red-legged frog, the U.S. Fish and Wildlife Service determined the California red-legged frog's Primary Constituent Elements (PCEs) are:

- Aquatic Breeding Habitat (PCE 1) – Standing bodies of fresh water (with salinities less than 4.5 parts per trillion), including natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.
- Aquatic Non-Breeding Habitat (PCE 2) – Freshwater pond and stream habitats, as described above, that may not hold water long enough for the species to complete its aquatic life cycle but which provide for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult California red-legged frogs. Other wetland habitats considered to meet these criteria include, but are not limited to: plunge pools within intermittent creeks, seeps, quiet water refugia within streams during high water flows, and springs of sufficient flow to withstand short-term dry periods.
- Upland Habitat (PCE 3) – Upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mile (1.6 kilometers) in most cases (i.e., depending on surrounding landscape and dispersal barriers) including various vegetation types such as grassland, woodland, forest, wetland, or riparian areas that provide shelter, forage, and predator avoidance for the California red-legged frog. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the aquatic, wetland, or riparian habitat. These upland features contribute to: (1) Filling of aquatic, wetland, or riparian habitats; (2) maintaining suitable periods of pool inundation for larval frogs and their food sources; and (3) providing nonbreeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), small mammal burrows, or moist leaf litter.
- Dispersal Habitat (PCE 4) – Accessible upland or riparian habitat within and between occupied or previously occupied sites that are located within 1 mile (1.6 kilometers) of each other, and that support movement between such sites. Dispersal habitat includes various natural habitats, and altered habitats such as agricultural fields, that do not contain barriers (e.g., heavily traveled roads without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large lakes or reservoirs over 50 acres (20 hectares) in size, or other areas that do not contain those features identified in PCE 1, 2, or 3 as essential to the conservation of the species.

Two critical habitat designations occur in the Plumas National Forest: BUT-1 Hughes Place Pond and YUB-1 Little Oregon Creek (figure 9). Each of these critical habitat designated areas contains aquatic habitat for breeding and non-breeding activities (PCEs 1 and 2), contains upland habitat for foraging

(PCE 3) and dispersal activities (PCE 4), and is considered occupied by the species. A total of 7,822 acres of critical habitat occurs in the project area (see figure 9).

Threats/Management Concerns

Potential risk factors to the California red-legged frog from resource management activities include modification or loss of habitat or habitat components, primarily aquatic and adjacent riparian environments used for reproduction, cover, foraging, and aestivation. Egg survival can be impacted by mining and road/trail construction through increases in fine sediments. Livestock grazing directly affects riparian vegetation, emergent vegetation, causes nutrient loading, and also affects channel morphology and hydrology. Timber harvest can result in loss of riparian vegetation and increased erosion and siltation of aquatic habitats. Long range upwind pesticide use and local urbanization/habitat destruction have been found to be strongly correlated with declines of California red-legged frog across its range (Davidson et al. 2001, 2002; Davidson 2004). Habitat loss and alteration, the introduction of bullfrogs and other aquatic predators, and historic timber harvest have been implicated in the population decline (Moyle 1973; Jennings and Hayes 1985; Jennings 1988).

Local Information

Adjacent to and in vicinity of the Plumas National Forest (Butte, Yuba, and Plumas Counties) many sightings of California red-legged frogs were reported in the early 1960s near Lake Oroville. Specifically, frogs were identified from the North Fork Feather River and South Fork Feather River in 1961 (USFWS 2002). Since 1994, Forest Service and California Department of Fish and Wildlife databases indicate that the species has been detected at six general locations (figure 9). Currently, there are only two known populations remaining in the Forest (Hughes Place Pond and Little Oregon Creek) and both populations occur within designated critical habitat.

Plumas National Forest biologists regularly note amphibians found in aquatic habitats and conduct annual stream surveys across portions of the Forest. In addition, surveys for California red-legged frogs have occurred in the Plumas National Forest from 1996 to present. Within potentially suitable habitat, most of these surveys have followed the methodology described in Fellers and Freel (1995) and by the U.S. Fish and Wildlife Service's California red-legged frog survey protocol (2005). Potentially suitable habitat was defined by the Plumas National Forest as lakes, ponds, perennial and intermittent streams, wet meadows, and 1 mile surrounding potential breeding habitats on the west slope of the forest between 870 feet (265 meters) and 5,301 feet (1,616 meters) in elevation that are, in part, associated with historical occurrences. A total of 271,121 acres of potentially suitable habitat occurs in the project area (see figure 9). Potentially suitable habitat in and outside of designated critical habitat was assumed to be occupied based on the spatial extent of historical detections.

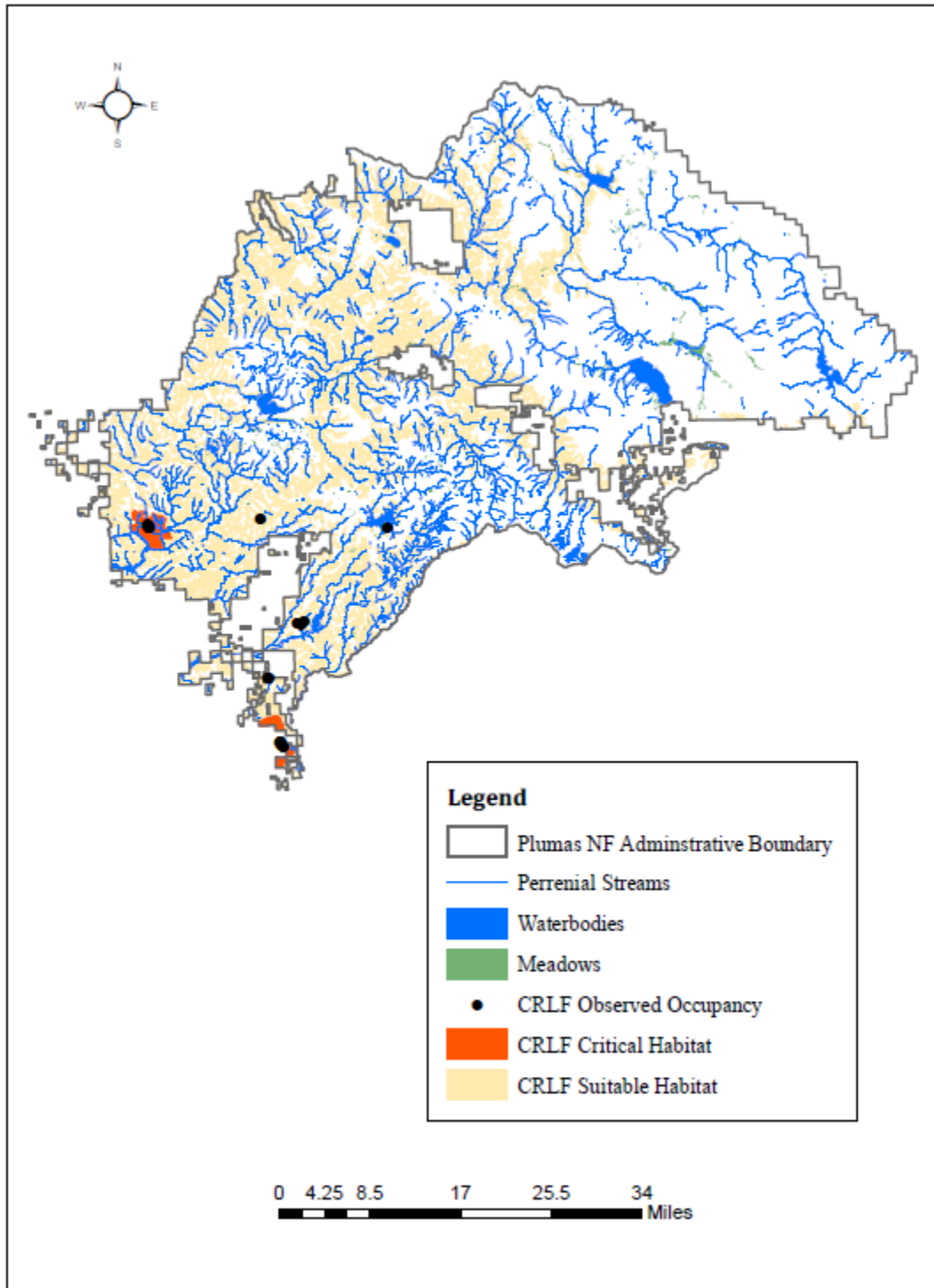


Figure 9. Critical and potentially suitable habitats and recorded observations of California red-legged frog (CRLF) relative to the location of streams, waterbodies, wetlands, and meadows in and near the Plumas National Forest

Sierra Nevada yellow-legged frog (*Rana sierrae*)

The Sierra Nevada yellow-legged frog (*Rana sierrae*) is an endangered species endemic to California. Historically, the Sierra Nevada yellow-legged frog and mountain yellow-legged frog (*Rana muscosa*) were found throughout the Sierra Nevada mountain range in California and Nevada and along the transverse range in southern California. Prior to 2007, these two species were considered to represent a single species; *Rana muscosa sensu lato* (Vredenburg et al. 2007). Frogs occurring in the northern Sierra Nevada are believed to be Sierra Nevada yellow-legged frogs based on genetic work, morphology and acoustics. The U.S. Fish and Wildlife Service classified the Sierra Nevada yellow-legged frog as endangered under the Endangered Species Act in 2014 (79 FR 24255) and the species' critical habitat was designated in 2016 (USFWS 2016; 81 FR 59045). The species is considered threatened by the California Department of Fish and Wildlife (CDFW 2018).

Habitat and Life History

Sierra Nevada yellow-legged frog can be found in the El Dorado, Inyo, Lassen, Plumas, Sierra, Stanislaus, Tahoe, and Lake Tahoe Basin National Forests (USFWS 2014b). In general, the species occurs above 4,500 feet in elevation, and inhabits ponds, lakes, and streams with moderate to high gradient channels containing sufficient depth for overwintering (Jennings and Hayes 1994). Individuals are highly aquatic, typically utilizing only the immediate bank and emergent rocks and logs. Historically streams with a bank of less than 10 inches in vertical height with a moderately rocky, sparsely vegetated bank harbored the densest populations (Mullally and Cunningham 1956). Frogs have not been detected greater than 75 feet (23 meters) from a stream bank (MGW Biological and Klamath Wildlife Resources 2006). They prefer well illuminated, sloping banks of meadow streams, riverbanks, isolated pools, and lake borders with vegetation that is continuous to the water's edge (Zeiner et al. 1988; Martin 1992). In the fall, as temperatures decline, frogs have been observed to move as far as one mile downstream within the stream channel (MGW Biological and Klamath Wildlife Resources 2006). The occupancy patterns of frogs serve to fulfill three fundamental life history requirements: overwintering, breeding and foraging.

Frogs appear to be quite tolerant of variable water temperatures, as they are able to fully function in water as cold as 37.4 degrees Fahrenheit (3 degrees Celsius), and tadpoles have been found in water as warm as 80.6 degrees Fahrenheit (27 degrees Celsius); however, these values may represent maximum tolerances for this species (Mullally and Cunningham 1956). Body temperature is regulated by being primarily diurnal, basking throughout much of the day, utilizing the warmer shallow areas in lakes and streams, and occupying colder water areas to reduce body temperature when necessary (Bradford 1984).

Tadpoles (larvae), subadults, and adults overwinter in deep lakes or pools with undercut banks that provide cover (Martin 1992). Frogs (subadults and adults) may hibernate underwater during the winter and mortality may occur from oxygen deprivation under ice (Bradford 1984). At least some of the population overwinters in shallow lakes (less than 1.5 meters) that likely freeze to the bottom most years. These frogs likely avoid freezing by using underwater crevices (Pope and Matthews 2001). Frogs use near-shore ledges and crevices in fractured bedrock along the shoreline that are close (less than 3 feet) to the water's surface. These crevices are typically very narrow, but may open to larger areas deeper within the rock and often contain multiple individuals, indicating that this species overwinters in aggregations. Both aggregations and the surrounding granite likely insulate individual animals from temperature extremes throughout the winter (Matthews and Pope 1999). Site fidelity is high for breeding, foraging and overwintering for this species (Matthews and Preisler 2010).

Breeding occurs soon after spring thaw (Vredenburg et al. 2005). During spring thaw, frogs emerge to the surface to bask in the sun, or travel over ice and snow to other nearby bodies of water (Pope and Matthews 2001), while larvae seek warmer water near shore (after spring turnover in large bodies of

water; Bradford 1984). Suitable breeding habitat is considered to be low gradient (up to 4 percent) perennial streams and lakes. Streams in this category generally have the potential for deep pools and undercut banks which provide the habitat requirements of this frog. At relatively high elevations, breeding occurs between May and August as soon as the meadows and lakes are free of snow and ice. At lower elevations, breeding occurs between March and June once high water in streams subsides. Sierra Nevada yellow-legged frogs usually lay their eggs in clusters submerged along stream banks or on vegetation. Tadpoles require at least one year before metamorphosis to the adult stage. Tadpoles in some high elevation populations may require up to three years before undergoing metamorphosis (Knapp 1996). Metamorphosis occurs in July or August (Vredenburg et al. 2005). The time required to reach reproductive maturity is believed to vary between 3 and 4 years after metamorphosis (Vredenburg et al. 2005).

Adults primarily feed on aquatic and terrestrial invertebrates favoring terrestrial insects such as beetles, flies, ants, bees, and true bugs (Jennings and Hayes 1994). Adults also consume Pacific treefrog (*Pseudacris regilla*) tadpoles, which appears to be an important component of their diet in some populations (Zeiner et al. 1988; Pope and Matthews 2001). The Sierra Nevada yellow-legged frog tadpoles graze on algae and diatoms along rocky bottoms in streams, lakes and ponds. Garter snakes and introduced trout prey upon Sierra Nevada yellow-legged frog tadpoles and adults (Zeiner et al. 1988; Knapp 1996).

Female frogs can live up to 14 years in age with males living up to 12 years in age (Matthews and Miaud 2007). Matthews and Preisler (2010) estimated over 11 percent of a population survived to an age of 10 years old (44 individuals). Males lack vocal sacks and do not produce the typical mating calls that are common in many frog species, nor do males form breeding aggregations (Matthews and Miaud 2007). Frogs grow faster and are generally larger at lower elevations, likely because the relatively longer summer at lower elevations provides greater time foraging and growth compared to higher elevation sites (Matthews and Miaud 2007). However, populations at higher elevations, where summer is relatively shorter, often exhibit higher annual survival rates in years with a relatively large snowpack.

Critical Habitat

On August 26, 2016, the U.S. Fish and Wildlife Service finalized designation of critical habitat for the Sierra Nevada yellow-legged frog (81 FR 59045). Physical or biological features for the Sierra Nevada yellow-legged frog were determined to be (1) space for individual and population growth and for normal behavior, (2) food, water, air, light, minerals, or other nutritional or physiological requirements, (3) cover or shelter, (4) sites for breeding, reproduction or rearing (or development) of offspring, (5) habitats protected from disturbance or representative of the historical, geographic, and ecological distributions of the species (81 FR 59045). Based on our current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, the U.S. Fish and Wildlife Service determined that the PCEs specific to the Sierra Nevada yellow-legged frog are:

- Aquatic habitat for breeding and rearing (PCE 1) – Habitat that consists of permanent water bodies, or those that are either hydrologically connected with, or close to, permanent water bodies, including, but not limited to, lakes, streams, rivers, tarns, perennial creeks (or permanent plunge pools within intermittent creeks), pools (such as a body of impounded water contained above a natural dam), and other forms of aquatic habitat. This habitat must:
 - ♦ For lakes, be of sufficient depth not to freeze solid (to the bottom) during the winter (no less than 5.6 feet (1.7 meters), but generally greater than 8.2 feet (2.5 meters), and optimally 16.4 feet (5 meters) or deeper (unless some other refuge from freezing is available)).

- ♦ Maintain a natural flow pattern, including periodic flooding, and have functional community dynamics in order to provide sufficient productivity and a prey base to support the growth and development of rearing tadpoles and metamorphs.
- ♦ Be free of introduced predators.
- ♦ Maintain water during the entire tadpole growth phase (a minimum of 2 years). During periods of drought, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but they may still be considered essential breeding habitat if they provide sufficient habitat in most years to foster recruitment within the reproductive lifespan of individual adult frogs.
- ♦ Contain:
 - Bank and pool substrates consisting of varying percentages of soil or silt, sand, gravel, cobble, rock, and boulders (for basking and cover);
 - Shallower microhabitat with solar exposure to warm lake areas and to foster primary productivity of the food web;
 - Open gravel banks and rocks or other structures projecting above or just beneath the surface of the water for adult sunning posts;
 - Aquatic refugia, including pools with bank overhangs, downfall logs or branches, or rocks and vegetation to provide cover from predators; and
 - Sufficient food resources to provide for tadpole growth and development.
- Aquatic nonbreeding habitat (including overwintering habitat; PCE 2) – This habitat may contain the same characteristics as aquatic breeding and rearing habitat (often at the same locale), and may include lakes, ponds, tarns, streams, rivers, creeks, plunge pools within intermittent creeks, seeps, and springs that may not hold water long enough for the species to complete its aquatic life cycle. This habitat provides for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult mountain yellow-legged frogs. Aquatic nonbreeding habitat contains:
 - ♦ Bank and pool substrates consisting of varying percentages of soil or silt, sand, gravel, cobble, rock, and boulders (for basking and cover); perennial
 - ♦ Open gravel banks and rocks projecting above or just beneath the surface of the water for adult sunning posts;
 - ♦ Aquatic refugia, including pools with bank overhangs, downfall logs or branches, or rocks and vegetation to provide cover from predators;
 - ♦ Sufficient food resources to support juvenile and adult foraging;
 - ♦ Overwintering refugia, where thermal properties of the microhabitat protect hibernating life stages from winter freezing, such as crevices or holes within bedrock, in and near shore; and/or
 - ♦ Streams, stream reaches, or wet meadow habitats that can function as corridors for movement between aquatic habitats used as breeding or foraging sites.
- (3) Upland areas (PCE 3) –
 - ♦ Upland areas adjacent to or surrounding breeding and nonbreeding aquatic habitat that provide area for feeding and movement by mountain yellow-legged frogs.
 - For stream habitats, this area extends 82 feet (25 meters) from the bank or shoreline.

- In areas that contain riparian habitat and upland vegetation (for example, mixed conifer, ponderosa pine, montane conifer, and montane riparian woodlands), the canopy overstory should be sufficiently thin (generally not to exceed 85 percent) to allow sunlight to reach the aquatic habitat and thereby provide basking areas for the species.
- For areas between proximate (within 984 feet (300 meters)) water bodies (typical of some high mountain lake habitats), the upland area extends from the bank or shoreline between such water bodies.
- Within mesic habitats such as lake and meadow systems, the entire area of physically contiguous or proximate habitat is suitable for dispersal and foraging.
- ♦ Upland areas (catchments) adjacent to and surrounding both breeding and nonbreeding aquatic habitat that provide for the natural hydrologic regime (water quantity) of aquatic habitats. These upland areas should also allow for the maintenance of sufficient water quality to provide for the various life stages of the frog and its prey base.

Six critical habitat designations occur within the Plumas National Forest for the Sierra Nevada yellow-legged frog: subunits 1A Morris Lake, 1B Bean Creek, 1C Deanes Valley, 1D Slate Creek, 2A Boulder/Lone Rock Creeks, and 2B Gold Lake (figure 10). Although these critical habitat designated areas contain introduced fish, the subunits are occupied by the species and contain aquatic habitat for breeding and non-breeding activities (PCEs 1 and 2) and upland habitat for foraging (PCE 3). There are a total of 66,340 acres of critical habitat within the forest boundary.

Threats/Management Concerns

The decline of yellow-legged frogs in the Sierra Nevada has largely been attributed to the introduction of salmonid fishes during the last century (78 FR 24471). Prior to stocking, fish were generally absent from the mid to high elevations in the Sierra Nevada (Hayes and Jennings 1986; Bradford et al. 1993; Knapp 1996). Both the distribution and abundance of the Sierra Nevada yellow-legged frog larvae are significantly reduced when trout are introduced to an area (Knapp et al. 2001). When fish are removed from an area, frog populations immediately begin to recover regardless of other habitat conditions (Knapp et al. 2001; Knapp et al. 2007). Additionally, when fish are removed, the larvae numbers mirror larvae numbers in lakes where fish were never introduced (Knapp et al. 2001).

Disease is another major source of concern for Sierra Nevada yellow-legged frogs. Two diseases are particularly hard on this species. The first is known as “red-leg” disease and is caused by the bacterium *Aeromonas hydrophila*. “Red-leg” disease is attributed to the die-off of approximately 800 adult frogs at a single location over the timespan of a single season (Bradford 1991). More recently, the disease chytridiomycosis has emerged as a significant threat to the species (Briggs et al. 2005; Oullet et al. 2005; Wake and Vredenburg 2008). This second disease, amphibian chytridiomycosis, is caused by the fungus *Batrachochytrium dendrobatidis* (Bd). Chytridiomycosis is an emerging infection disease which has caused numerous declines and possible extinctions of amphibians globally. Sierra Nevada yellow-legged frogs are well documented as being sensitive to this disease. Animals are able to acquire Bd zoospores by simply being in an infected lake, frog-frog contact is not required (Rachowicz and Briggs 2007). Although Bd is considered a primary cause for many of the disappearances of Sierra Nevada yellow-legged frogs, some populations are able to coexist with the fungus. At least 83 percent of all known sites currently have Bd present (Knapp et al. 2011).

Additional reasons for yellow-legged frog decline or contributing factors include airborne pesticides (Davidson et al. 2002; Davidson 2004; Davidson and Knapp 2007), loss of habitat, altered habitat, and grazing. Davidson and Knapp (2007) evaluated over 6,800 sites in the southern Sierra Nevada comparing

mountain yellow-legged frog occupancy with presence of introduced fish, habitat conditions, and predicted exposure to airborne pesticides from agricultural lands upwind in California's Central Valley, and found that airborne pesticides appeared to have a pronounced negative effect on mountain yellow-legged frog occupancy independent of the other factors examined.

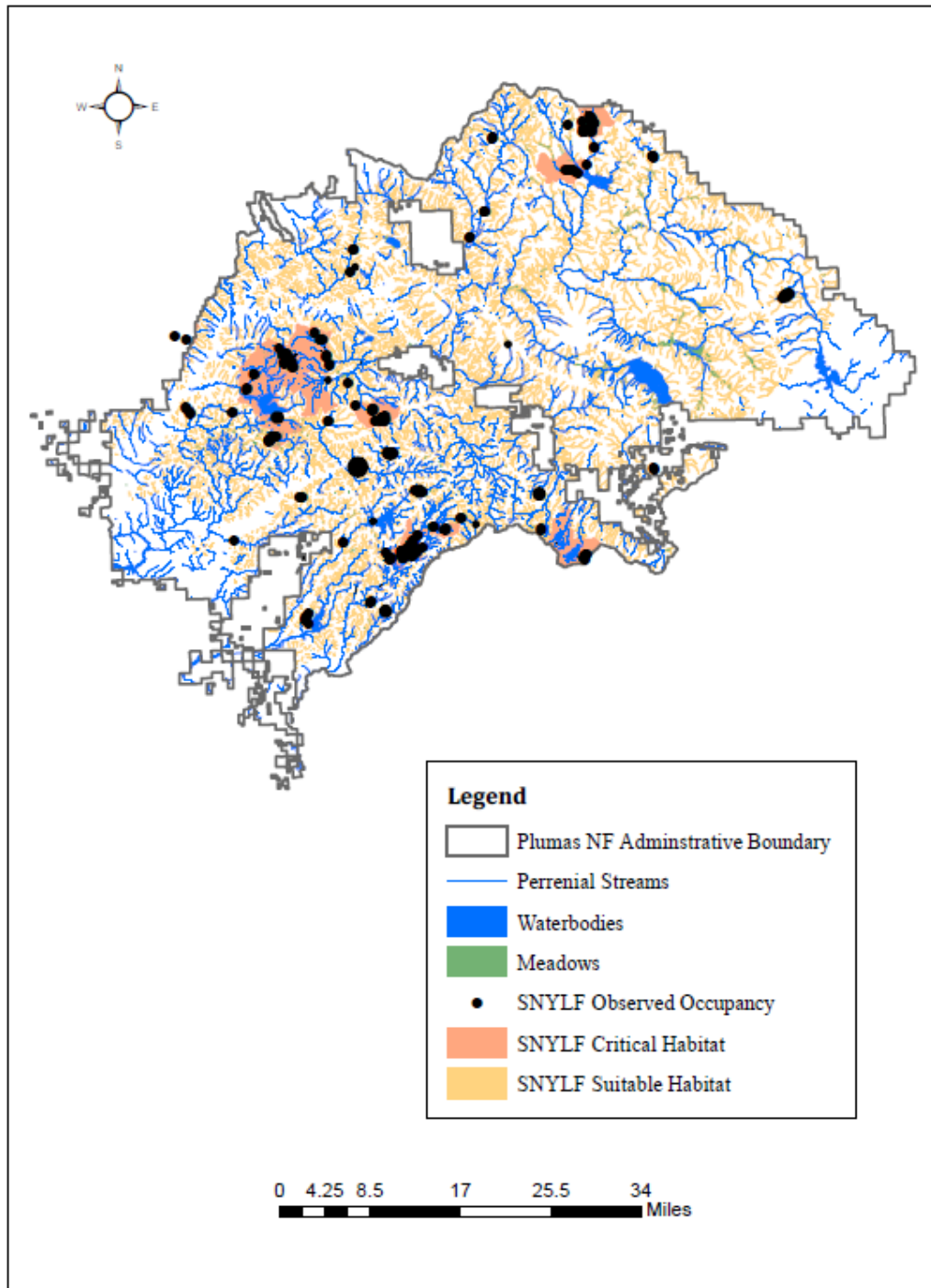


Figure 10. Critical and potentially suitable habitats and recorded observations of the Sierra Nevada yellow-legged frog (SNYLF) relative to streams, waterbodies, wetlands, and meadows in and near the Plumas National Forest

Local Information

The Plumas National Forest initiated herpetological surveys in the early 1990s, which included areas likely to support Sierra Nevada yellow-legged frogs. These surveys have continued to the present; however, fewer previously unknown populations are being found in recent surveys. The California Department of Fish and Wildlife has also completed extensive surveys for the species in most habitat types where the frog would be expected to occur. Based on these surveys and records, the Sierra Nevada yellow-legged frog is known to occur among a number of locations containing suitable habitat within the Plumas National Forest (figure 10). In particular, the Sierra Nevada yellow-legged frog is known to occur in more than 50 general locations (e.g., waterbodies).

Suitable habitat defined within the Plumas National Forest includes lakes, ponds, perennial and intermittent streams, wetlands and marshes, and meadows that are above 3,500 feet in elevation, and 85 feet of upland habitat surrounding these water features and the area between proximate (within 984 feet) waterbodies (e.g., high mountain lakes; see figure 10). A total of 107,926 acres of potentially suitable habitat occurs within the project area (figure 10). Potentially suitable habitat in and outside of designated critical habitat was assumed to be occupied, based on the spatial extent of historical detections.

USFS Region 5 Sensitive Species

Foothill yellow-legged frog (*Rana boylei*)

The foothill yellow-legged frog (*Rana boylei*) is listed as sensitive on the Region 5 Forester's Sensitive Species List (USDA Forest Service 2014a). Foothill yellow-legged frogs have experienced significant population declines across the majority of the known range (Hayes et al. 2016). As a result, the species is currently classified as a State Species of Special Concern by the California Department of Fish and Wildlife (CDFW 2018) and being considered for Federal listing by the U.S. Fish and Wildlife Service (80 FR 19259) and state listing by the California Department of Fish and Wildlife (CDFW 2017). The Forest Plan, as amended, does not provide specific management guidelines for this species. The standards and guidelines for Riparian Conservation Areas provide direction for foothill yellow-legged frog management on National Forest System lands (USDA Forest Service 2004). In 2016, a Conservation Assessment was published that provides further management direction on National Forest System lands for the species (Hayes et al. 2016).

Habitat and Life History

Historically, this frog was found across most of southwestern Oregon west of the Cascades Mountains crest south through California to Baja California (Jennings and Hayes 1994; Fellers 2005). The species is found in most of northern California west of the Cascade Mountains crest, in the Coast Ranges from the California-Oregon border south to the Transverse Mountains in Los Angeles County and along the western slope of the Sierra Nevada mountains south to Kern County. Isolated populations have been reported from the San Joaquin Valley and the mountains near Los Angeles County. Foothill yellow-legged frogs can be found from near sea level to 6,370 feet (1,940 meters) where habitat is suitable (Jennings and Hayes 1994; figure 11). Within California, the frog occurs or may occur in all national forests except for the Cleveland, Inyo, Modoc, and Lake Tahoe Basin National Forests. Although there are numerous occupied streams, only 30 of the 213 sites in California where frogs occur have 20 or more adults (Fellers 2005; Hayes et al. 2016).

Foothill yellow-legged frogs are found in partially shaded rocky streams in a variety of habitats including: valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral and wet meadows and appear to be highly dependent on free water for all life stages (Jennings and Hayes 1994; Hayes et al. 2016). The habitat characteristics of

non-breeding adult foothill yellow-legged frogs have not been fully evaluated. Leidy et al. (2009) observed a group of six adults aggregated on a vertical ledge over a meter away from water in late summer. The location of this aggregation also indicates that adults may migrate up tributaries containing large-sized boulders and bedrock to use the cooler air and water temperatures, and to avoid predators and high water flows (Leidy et al. 2009). Hayes, et al (2016) reported that adult frogs remain near (within 39 feet or 12 meters) the stream channel, use watercourses as movement corridors (Bourque 2008), and that these movements are greatest in the spring when moving to and away from breeding sites (Van Wagner 1996; Wheeler and Welsh 2008). Overwintering behavior is poorly understood, but adults are commonly found in tributaries prior during the non-breeding season. They are rarely seen more than a few meters away from water, but it remains unknown if they use upland areas during winter months (Kupferberg 1996; Hayes et al. 2016). Habitat use by juvenile frogs is also largely unknown. Some evidence indicates they potentially use smaller waterways such as springs or small tributary streams (Lind et al. 2011).

Frogs can initiate breeding during the spring when air and water temperatures increase to at least 50 degrees Fahrenheit (10 degrees Celsius) and stream flows subside (Hayes et al. 2016). Duration of breeding typically continues at least a month with an average duration of 50 days between first and last egg depositions (Kupferberg 1996; Wheeler and Welsh 2008). Breeding habitat is typically classified as shallow portions of a stream with riffles containing cobble-sized or larger rocks as substrate (Jennings and Hayes 1994; Hayes et al. 2016). These streams are further defined by having low-water velocities near tributary confluences in shallow reaches and are wider and shallower than non-breeding sites. They also tend to have emergent rocks and are typically asymmetrical with cobble or small boulder bars (Kupferberg 1996; Wheeler and Welsh 2008). Egg attachment sites are usually cobbles or boulders, but frogs may sometimes use bedrock or vegetation. These sites are often on the lee side of rocks or beneath overhangs with a narrow range of low-water velocities. Coarse sediment enables frogs to choose the best oviposition site to shield egg masses from high-flows. The reproductive strategy of the foothill yellow-legged frog is well suited to rivers with predictable peak flows (i.e., spring floods) and summer droughts (Kupferberg 1996). Females lay a single annual clutch of between 300 and 2,000 eggs (Jennings and Hayes 1994; Kupferberg 1996). The critical thermal maximum for embryos is approximately 78 degrees Fahrenheit (26 degrees Celsius) and eggs are typically found in waters from 48 to 70 degrees Fahrenheit (9 to 21.5 degrees Celsius) (Jennings and Hayes 1994; Kupferberg 1996). Incubation lasts between 5 and 37 days depending on water temperature and position within the clutch. Eggs near the attachment point and eggs in the center of the clutch typically hatch later than eggs on the periphery of the clutch (Kupferberg 1996; Fellers 2005). After hatching, tadpoles move away from the egg mass. As with egg development, larval development is temperature dependent with metamorphosis typically occurring 3 to 4 months after hatching with no documented overwintering of larvae.

Larval foothill yellow-legged frogs primarily consume algae and will preferentially graze on epiphytic diatoms as this food item allows them to grow more rapidly (Jennings and Hayes 1994). Post-metamorphosis likely consume both aquatic and terrestrial insects but there is little research on the subject (Jennings and Hayes 1994). Adult diet is thought to include: flies, moths, hornets, ants, beetles, grasshoppers, water striders and snails with a terrestrial arthropod composition of 87.5 percent insects and 12.6 percent arachnids (Fellers 2005; Hayes et al. 2016).

Threats/Management Concerns

Potential risk factors to the foothill yellow-legged frog include water development and diversion, climate change, modification or loss of habitat or habitat components from urbanization, the presence of non-native species, and mining (Hayes et al. 2016). High mortality in this species occurs during the egg and larval life stages, and mortality has been associated with alterations in hydrologic regimes and degraded water quality (Kupferberg 1996; Lind et al. 1996; Hayes et al. 2016). Loss of genetic diversity due to

habitat loss or fragmentation is a major threat to foothill yellow-legged frogs. Populations that are fragmented (greater than 10 kilometers apart) are prone to genetic drift when barriers such as dams prevent dispersal between isolated populations (Dever 2007). Pesticides can also impact these frogs in both original and degraded forms. Air-borne pesticides are implicated as the most significant threat to this species, especially for Sierra Nevada populations which are directly impacted by pesticide drift from the Central Valley (Fellers 2005). The introduced species primarily implicated to consume, compete with, or expose foothill yellow-legged frogs to pathogens include smallmouth bass (*Micropterus dolomieu*), American bullfrogs (*Rana catesbiana*), and a variety of crayfish species (*Pacifastacus* spp.) (Fellers 2005; Hayes et al. 2016). Several diseases pose an additional threat to foothill yellow-legged frogs. Perhaps the most significant disease threat that impacts this species is *Batrachochytrium dendrobatidis* which causes amphibian chytridomycosis. This fungus has been found in this species and has potentially had significant impacts to other amphibian species worldwide (Fellers 2005).

Local Information

In the Plumas National Forest, foothill yellow-legged frog surveys have been conducted primarily by Plumas National Forest staff. Based on Forest Service and California Department of Fish and Wildlife databases, foothill yellow-legged frogs have been detected within the Plumas National Forest boundary in at least 42 distinct locations (figure 11). Most occurrences are found in smaller, lower elevation streams, but they also occur in relatively large rivers like the North, Middle, and South Forks of the Feather River.

In general, potentially suitable habitat was defined within the Plumas National Forest to include perennial and intermittent streams on the west slope of the forest that are below 4,200 feet (1,280 meters) in elevation, and 100 feet (30 meters) of upland habitat surrounding these water features to account for the species' limited use of upland areas (see Hayes et al. 2016). We estimated that the project area contains approximately 133,245 acres of potentially suitable habitat for the foothill yellow-legged frog and the species has been historically documented in at least 42 distinct locations (waterbodies) within the project area (figure 11). Potentially suitable habitat was assumed to be occupied based on the spatial extent of historical detections.

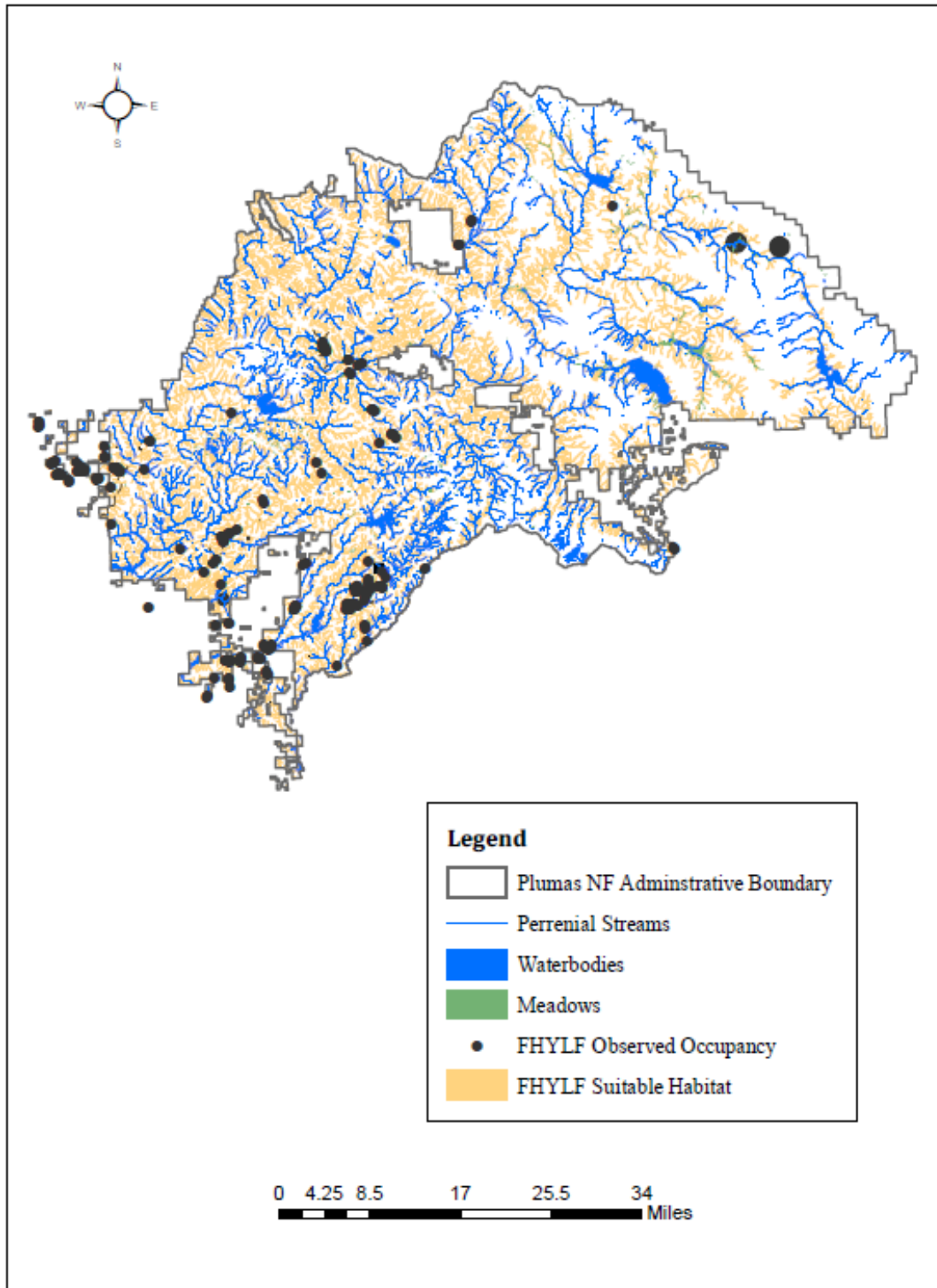


Figure 11. Recorded observations and potentially suitable habitat of foothill yellow-legged frog (FYLF) relative to streams, waterbodies, wetlands, and meadows in and near the Plumas National Forest

Western pond turtle (*Actinemys marmorata*)

The western pond turtle (*Actinemys marmorata*) is listed as sensitive on the Region 5 Forester's Sensitive Species List (USDA Forest Service 2014a). In addition, the species is currently classified as a State Species of Special Concern by the California Department of Fish and Wildlife (CDFW 2018) and being considered for Federal listing by the U.S. Fish and Wildlife Service (80 FR 19259). The Forest Plan, as amended, does not provide specific management guidelines for this species. The USDA Forest Service (2004) presents standards and guidelines for Riparian Conservation Areas for California red-legged frogs that likely provide relevant management direction for western pond turtles.

Habitat and Life History

The western pond turtle occurs 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). Fossil fragments have been found east of the current range indicating that the species was once more widespread (Buskirk 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 currently unclear if these are relictual or introduced populations (Lovich and Meyer 2002). Modern distribution is limited to parts of Washington, Oregon, California and northern Baja California (Buskirk 2002). Western pond turtles are the only native aquatic turtle in California and southern Oregon, in the northern part of its range it co-occurs with only the western painted turtle (*Chrysemys picta bellii*; Germano and Rathbun 2008). In California, the turtle can be found on all National Forests, except the Inyo and Lake Tahoe Basin.

Western pond turtles are long lived (up to 40 years) habitat generalists that occur in a wide variety of permanent and intermittent aquatic habitats (Bury and Germano 2008). Abundance for the species has been well studied and densities often range from 23 to 214 turtles per hectare throughout most of the range (Lovich and Meyer 2002; Germano 2010). Aquatic habitats used by the western pond turtle include lakes, natural ponds, rivers, oxbows, permanent streams, intermittent streams, marshes, freshwater and brackish estuaries and vernal pools (Buskirk 2002; Bury and Germano 2008; Germano and Rathbun 2008). Individuals often favor habitats containing refugia from predators (e.g., deep pools) and basking sites composed of logs, snags, boulders, emergent vegetation, large logs and boulders. The known elevation range of the species in California extends from sea level to 4,690 feet (1,430 meters; Jennings and Hayes 1994). Although the species has been detected in higher elevations, these occurrences may be the result of introduction (Jennings and Hayes 1994).

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 (Buskirk 2002; Bury and Germano 2008). Buskirk (2002) reported that wild western pond turtles have not been observed feeding out of the water in terrestrial habitat. Growth and maturation in western pond turtles is heavily influenced by food availability, basking behaviors, and ambient air and water temperatures (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).

The home range of western pond turtles is extensive and individuals have been observed to travel considerable distances in excess of 3,281 feet (1,000 meters; Buskirk 2002; Bury and Germano 2008). In California, the home range of males and females were observed to average 1 hectares and 0.3 hectare, respectively (Bury 1979). Western pond turtles have been observed to occur in terrestrial habitats as far as 1,640 feet (500 meters) from aquatic habitats (Reese and Welsh 1997). Adults can use terrestrial habitat

frequently for prolonged periods of time (greater than 7 months per year) while nesting and overwintering (Reese and Welsh 1997). Individuals have been observed to overwinter under leaf litter or fine soil in locations with level or upland slopes containing dense understory vegetation (Bury and Germano 2008). Individuals can move upland as early as September, but typically move following the first winter storm in November or December. Not all individuals move upland to overwinter, some move to nearby ponds for the winter (Davis 1998). Animals have been observed moving underneath ice in ponds and potentially congregate in shallow areas (Buskirk 2002).

Nesting often occurs in locations approximately 164 feet (50 meters) or less from perennial stream courses that are dominated by gentle slopes (less than 15 degrees), and dry and well drained soils containing grasses and herbaceous annual vegetation with few shrubs (Holland 1994; Reese and Welsh 1997; Lovich and Meyer 2002). As a result, roads or small plantations can be used for nesting or overwintering (Buskirk 2002). 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). As a result, roads or small plantations can be used for nesting or overwintering. Clutch size varies significantly among drainages; however, it does not differ significantly across years or within individual drainages (Germano and Rathbun 2008). Mean clutch size ranges from 4.5 +/- 0.25 eggs on the Santa Rosa Plateau to 7.3 +/- 1.18 in southern Oregon. Average annual egg production for 39 individuals in southern California was 7.2 +/- 3.9 eggs. When double clutching occurs, the first clutch typically contains more eggs than the second clutch (Scott et al. 2008). 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).

Threats/Management Concerns

Western pond turtles have significantly declined with many populations representing less than 10 percent of the historical population size (Buskirk 2002). In California alone there has been a loss of 80 to 85 percent of western pond turtles since the 1850s. The primary threat to the species is considered to be habitat loss or degradation (Buskirk 2002; Lovich and Meyer 2002). Most of the historical habitat for this species has been permanently lost as a result of development for human occupancy. Riparian and wetland habitats have been cleared for agriculture use, destroyed by cattle, channelized and stripped of vegetation, or impacted by invasive plants that degrade water quality, alters stream structure and dries streams. Gold and gravel mining can both destroy habitat as well as introduce toxins through spills and illegal dumping. Groundwater pumping lowers water tables and further stresses riparian plant communities. Dehydration and pollution also pose a threat to turtles by making them more susceptible to disease (Vander Haegen et al. 2009; Polo-Cavia et al. 2010). Turtles of all life stages can be injured or killed by cattle occurring or vehicles operating in suitable habitat. Modern watercourse recreation also impacts these turtles. Recreation that interferes with basking or causes direct injury or mortality includes high-speed boating, water skiing, jet skiing, and fishing where animals may be directly caught or killed because they are viewed as competition (Buskirk 2002).

Local Information

Numerous surveys have been conducted in the Plumas National Forest during which western pond turtle observations were made. Based on Forest Service and California Department of Fish and Wildlife databases, the species has been documented within the Forest boundary at over 20 distinct locations since 1953 (figure 12). Most individuals occur in lower elevation ponds, streams, and small rivers with a few observations associated with ponds. Potentially suitable habitat was defined within the Forest to include perennial and intermittent streams, wetlands, ponds, and lakes on the west slope of the forest that are below 4,921 feet (1,500 meters) in elevation, and 1,640 feet (500 meters) of upland habitat surrounding these water features to account for the species' extensive use of upland areas (Reese and Welsh 1997;

Bury and Germano 2008). We estimated that the project area contains approximately 283,298 acres of potentially suitable western pond turtle habitat and the species has been historically documented in relatively low abundances in at least 20 distinct locations (waterbodies) within the project area (figure 12). Potentially suitable habitat was assumed to be occupied, based on the spatial extent of historical detections.

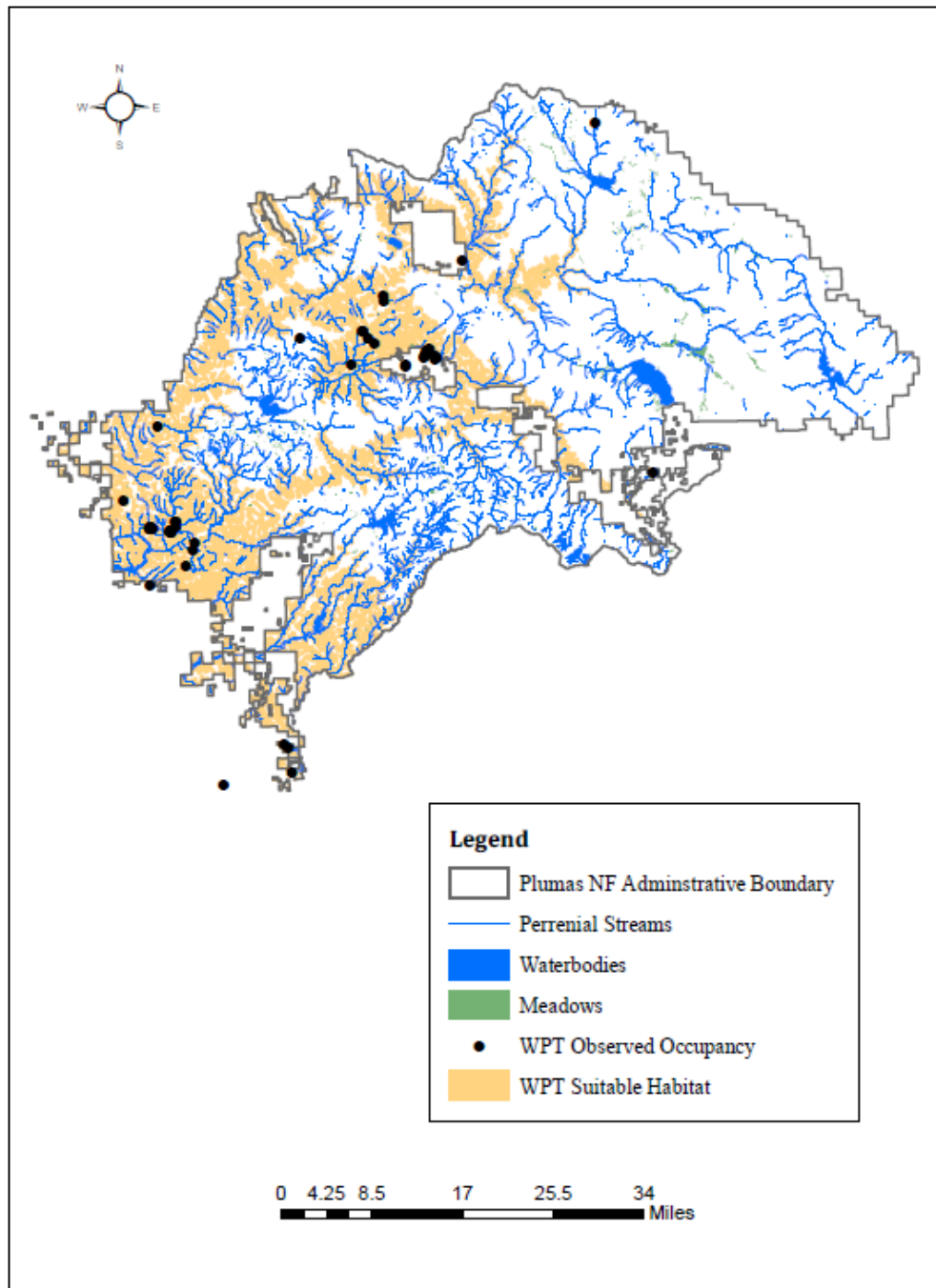


Figure 12. Recorded observations and potentially suitable habitat of western pond turtle (WPT) relative to streams, waterbodies, wetlands, and meadows in and near the Plumas National Forest

Hardhead (*Mylopharodon conocephalus*)

The hardhead (*Mylopharodon conocephalus*) is a minnow endemic to California and is listed as sensitive on the Region 5 Forester's Sensitive Species List (USDA Forest Service 2014a). In addition, the species is currently considered a State Species of Special Concern by the California Department of Fish and Wildlife (CDFW 2018). The Forest Plan (USDA Forest Service 2004) does not provide specific management guidelines for this species, but the standards and guidelines for the Aquatic Management Strategy address considerations applicable to conserving the hardhead.

Habitat and Life History

Individuals are widely distributed in large undisturbed low to mid-elevation streams (up to 4,921 feet or 1,500 meters) in the main Sacramento-San Joaquin drainage as well as the Russian River drainage (Reeves 1964; Moyle and Nichols 1973; Moyle 2002; Moyle et al 2015). Their range extends from the Kern River, Kern County, in the south to the Pit River, Modoc County, in the north (Moyle et al. 2015). In the Sacramento River drainage, hardhead are present in most of the larger tributary streams as well as the Sacramento River. In the lower reaches of the South Fork Yuba River, hardhead make up a substantial portion of the fish assemblage (Gard 2002).

Most streams occupied by hardhead have summer temperatures commonly around 68 degrees Fahrenheit (20 degrees Celsius). Optimal temperatures for the species ranges between 75 to 82 degrees Fahrenheit (24 to 28 degrees Celsius) (Knight 1985). Hardhead are relatively intolerant of low oxygen levels, especially at higher temperatures (Cech et al. 1990). Individuals prefer clear deep (greater than 1 meter) pools with sand-gravel-boulder substrates and slow water velocities (Moyle and Nichols 1973, Knight 1985, Moyle and Baltz 1985). In streams, adult hardhead tend to remain in the lower half of the water column, rarely moving into the upper levels (Knight 1985), while juveniles concentrate in shallow water close to the stream edges (Moyle and Baltz 1985; Moyle et al 2015). Hardhead are generally found in association with Sacramento pikeminnow (*Ptychocheilus grandis*) and Sacramento suckers (*Catostomus occidentalis*; Moyle 2002). Hardhead also tend to be absent from streams with introduced exotics, especially centrarchids (Moyle and Nichols 1973), or streams that have been severely altered by human activity (Baltz and Moyle 1993).

Hardhead mature after their second year and spawn in the spring (April and May) or early summer (Reeves 1964; Moyle et al. 2015). Adults occurring in large rivers may migrate to spawn in tributary streams (Moyle et al. 1995, 2015). Although hardhead spawning has not been observed, spawning habitat likely consists of sand or gravel in riffles, runs, or heads of pools (Wang 1986; Moyle 2002). Hardhead reach 7 to 8 centimeters by their first year, but growth slows in subsequent years. In the American River, hardhead reach 30 centimeters standard length in 4 years, whereas in Pit and Feather rivers it takes six years to reach that length (Moyle et al. 2015). Hardhead largely forage for benthic invertebrates and aquatic plant material in quiet water (Moyle et al. 2015). However, individuals will occasionally feed on plankton, surface insects, crayfish, and small fish. Smaller individuals (less than 20 centimeters standard length) feed primarily on mayfly larvae, caddisfly larvae, and small snails (Reeves 1964).

Threats/Management Concerns

Historically, hardhead have been regarded as a widespread and locally abundant species (Moyle 2002; Moyle et al 2015). Ongoing declines of the species are the result of habitat loss, fragmentation, degraded water quality, and invasions of non-native species. Moyle et al. (2015) reported that the threats to hardhead include, but are not limited to, (1) dams and diversions, (2) agriculture, (3) urbanization, (4) instream mining, (5) stream modification for transportation, (6) fisheries management ('harvest' associated with past eradication to benefit recreational fisheries), and (7) introduced non-native species.

Local Information

Hardhead have been detected in the North Fork Feather River above Lake Oroville (figure 13; PG&E 2014). Potentially suitable habitat in the other river basins has not been adequately surveyed. For this analysis, we defined potentially suitable habitat within the Plumas National Forest as named perennial streams below 4,921 feet (1,500 meters) in elevation within the North Fork Feather River, Middle Fork Feather River, and Indian Creek basins (figure 13). We estimated that the project area contains approximately 207 miles of potentially suitable hardhead stream habitat. For the purposes of this analysis potentially suitable habitat was assumed to be occupied.

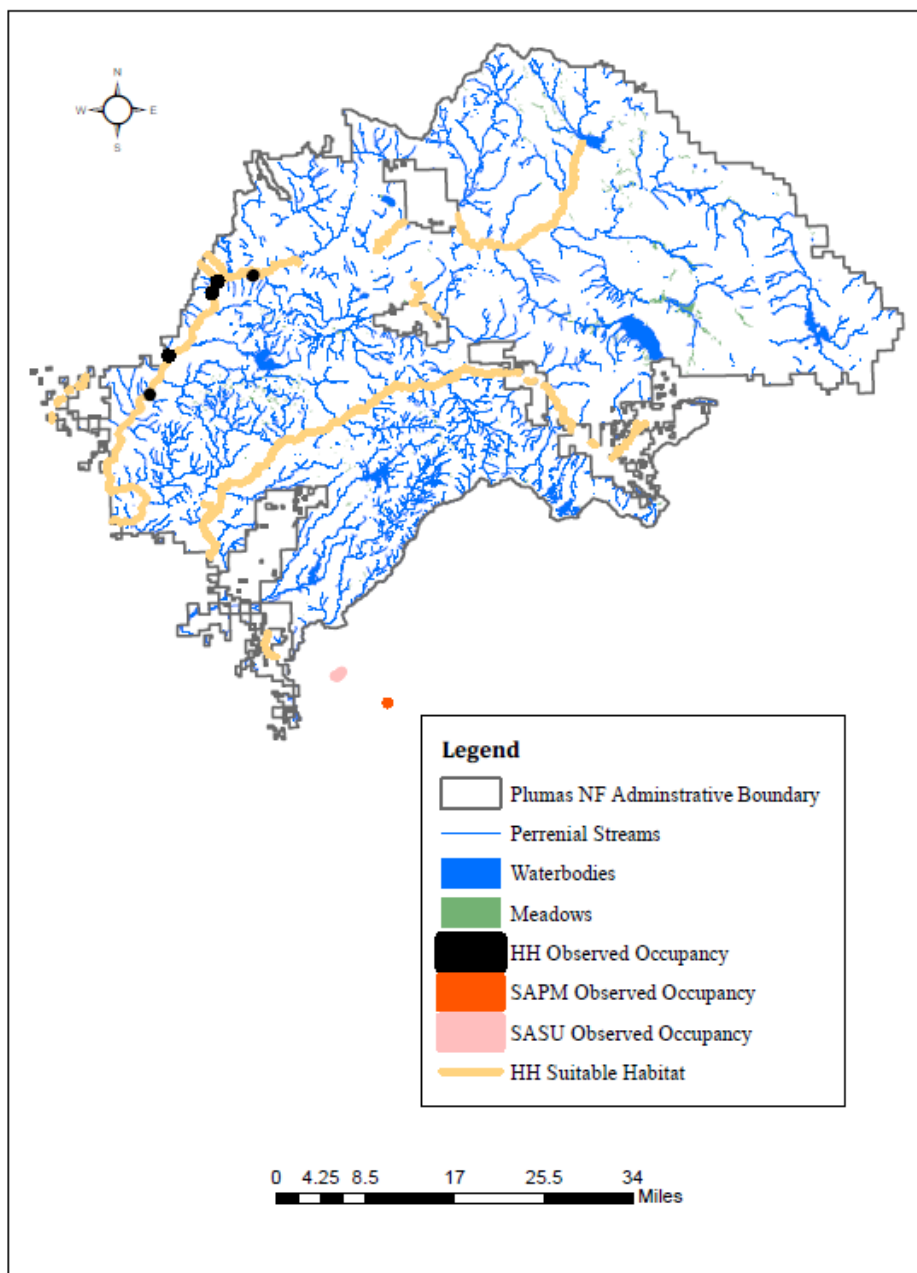


Figure 13. Recorded observations and potentially suitable habitat of hardhead (HH) as well as recorded observations of Sacramento pikeminnow (SAPM) and Sacramento suckers (SASU) relative to perennial streams, waterbodies, wetlands, and meadows in and near the Plumas National Forest

Environmental Consequences

Alternative Comparison

OSV use is permitted in the project area under each of the action alternatives (alternatives 1, 3, 4, and 5) and under the no-action alternative (alternative 1). Because similar activities are proposed under each action alternative the only major differences between them are their spatial extents and the minimum snow depths each requires for designated OSV trails and cross-country use areas. A comparison of designated trails (miles) and cross-country OSV-use areas (acres) proposed under each alternative is provided in chapter 2. Most of the potential effects considered in the species-specific analyses are described in the following section.

Effects Common to All Alternatives

Direct Effects

Direct effects are caused by the action and occur at the same time as the action where it occurs, which instantaneously affects individuals of a species. Potential direct effects of designated OSV use on fish, amphibians and other aquatic species considered in this analysis included injury or mortality from collision and harassment from noise disturbance (Bowles 1995; Dooling et al. 2015; Lima et al. 2015).

The risk of OSVs colliding with or crushing aquatic animals is likely low for semi-aquatic species (amphibians and western pond turtle) and discountable for completely aquatic species (fish and aquatic invertebrates). Over-snow vehicles would have to travel in and through water to collide with fish and other aquatic species (Lima et al. 2015). This was considered to be unlikely based on OSV use being prohibited over waterbodies and streams that are not frozen and covered by at least 12 inches of snow. Further, OSV operators tend to avoid riding in streams (i.e., in the water column below snow or ice cover) because it is illegal and to prevent damaging their OSVs. In addition, semi-aquatic species are typically less active during the majority of the OSV season of use, thereby limiting the risk of being crushed by OSVs. However, most amphibians become immobile if they are frightened or stressed, which makes them more susceptible to OSV collisions (Mazerolle et al. 2005). Some semi-aquatic animals may overwinter in upland habitat underneath the snow or may travel over the melting snow during the spring breeding season (Pope and Matthews 2001; Vredenburg et al. 2005), which makes them at risk of coming in contact with OSVs. If OSVs collide or make contact with semi-aquatic animals in occupied habitat, individuals can become injured and stressed or killed from the impact or from being crushed by the OSV or compaction of the snow under the OSV. Wildlife Resource Consultants (2004) observed that OSVs operating in the Sierra Nevada had compacted the snow and often reduced the amount of space between the soil and snow or ice in areas devoid of woody vegetation, which suggests that semi-aquatic animals overwintering in these habitats (e.g., wet meadows) can be affected. Injured or stressed individuals can have reduced rates of survival and fitness (Gabrielsen and Smith 1995).

Currently, there is considerable uncertainty how and to what extent fish and other aquatic species may be affected by noise disturbance, thus we relied on the results of research largely conducted on other wildlife (Dooling et al. 2015). Noise generated from OSVs can affect aquatic animals by interfering with auditory communication, increasing stress, and altering behavior, which may negatively affect fitness and reproductive success (Bowles 1995; Gabrielsen and Smith 1995; Dooling et al. 2015; Lima et al. 2015). However, those effects are likely minimal if the exposure to an individual is not recurring regularly or if the individual has been habituated to the disturbance (Bowles 1995). Under the action alternatives (alternatives 1, 3, 4, and 5), no new trails, roads, stream crossing, or cross-county areas are being proposed relative to the existing condition (see alternative 1). Rather, portions of existing high use

corridors (i.e., county, State, and National Forest System roads and trails) and current cross-county OSV-use areas will simply be officially designated or identified for OSV use. It is assumed that individuals whom currently over-winter in or near those areas may be already exposed and possibly habituated to the OSV related noise disturbances during the winter. Additionally, the effect of noise disturbance was considered negligible in designated cross-country OSV use area based on OSV use being more dispersed.

While there are a number of existing stream crossings on proposed designated trails under each of the action alternatives (table 58), the stream crossings would have a discountable effect on semi-aquatic (amphibians and western pond turtle) and aquatic species (fish) for the following reasons:

1. None of the alternatives involve the construction of any new crossings.
2. None of the existing structures would further impede or redirect flood flows, or cause any additional ground surface modifications that could change drainage patterns or the extent of impervious surfaces (McNamara 2018).

Table 58. Existing perennial stream crossings on proposed designated trails located within the critical habitat and/or potentially suitable habitat of each federally listed and sensitive aquatic animal species

Species	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Critical Habitat					
California red-legged frog	0	0	0	0	0
Sierra Nevada yellow-legged frog	15	13	8	21	8
Potentially Suitable Habitat					
California red-legged frog	57	64	57	94	57
Sierra Nevada yellow-legged frog	96	129	115	237	115
Foothill yellow-legged frog	85	112	107	209	107
Western pond turtle	4	11	6	21	6
Hardhead	0	0	0	0	0

3. Annual monitoring would include monitoring of streams and riparian systems, wetland, and other sensitive aquatic habitats occurring near the groomed trail system to ensure that prescribed BMPs remain effective and accomplishing their objectives. Forest Service water quality BMP 4-7 (USDA Forest Service 2000) would be followed for monitoring guidelines.
4. If needed, implementing other protective measures would further ensure that aquatic resources are adequately protected. Possible protective measures could include restricting access, educational materials, signage, or the use of barriers or trail re-routes.

Indirect Effects

Indirect effects are caused by the action and occur later in time or are farther removed spatially. The potential indirect effects to habitat considered in this analysis included ground and vegetation disturbance, snow compaction, and chemical pollution. Designating trails and cross-country areas for OSV use also has the potential to impact aquatic wildlife through direct, indirect, or cumulative disturbance to individuals (e.g., noise resulting in interrupted or reduced breeding or feeding, increased stress leading to the depletion of energy stores, or alterations in movement patterns) resulting in potential decreases in fecundity.

Ground Disturbance and Snow Compaction

Snow compaction and soil disturbance related to OSV use could indirectly affect aquatic animal species by delaying snowmelt, reducing or degrading subnivean habitats, and increasing erosion into the aquatic environment. Wildlife Resource Consultants (2004) observed that OSVs operating in the Sierra Nevada had compacted the snow and reduced the amount of space between the soil and snow or ice in areas containing low snow cover and no woody vegetation. This suggests that semi-aquatic animals overwintering in these areas (e.g., wet meadows) can experience small scale reductions in subnivean habitat availability. We presume this effect is mostly discountable because it would likely occur along heavily used designated OSV trails where semi-aquatic animals are unlikely to be overwintering in subnivean habitats. Additionally, proposed minimum snow depths should reduce the effects of OSVs compacting or disturbing riparian vegetation, soils, and/or snow. They would also provide additional noise attenuation and effectively shorten the season of use, in turn, reducing emissions.

Although snowmobiles and other OSVs exert relatively low ground pressure, studies have found that snowmobiles compact snow and this can delay snowmelt by up to a two-weeks (Neumann and Merriam 1972; Keddy et al. 1979). Snow compaction can reduce the ability of the snow to melt and runoff slowly, which can alter the flow regime in streams at local scales. Because OSV use will likely not be heavily concentrated throughout most of the designated OSV-use areas (i.e., will be dispersed and mostly concentrated along the trails), widespread snow compaction is unlikely. As a result, measureable changes in hydrology on a watershed scale are not expected because snow compaction from OSV use will likely not affect an entire watershed (McNamara 2018).

Riparian vegetation can be affected by OSV use based on snow and/or soil compaction (Kozlowski 1999). Riparian vegetation is important to aquatic animal species by preventing pollutants from entering the aquatic environment (Barling and Moore 1994), providing shade and large woody debris, and nutrients to streams (Naiman et al. 1993; Naiman and Decamps 1997). Damage to vegetation is much more likely when OSV use is concentrated and occurs under low snow conditions (Greller et al. 1974; Fahey and Wardle 1998). In general, OSV use has the potential to affect woody riparian vegetation by bending and breaking of branches when OSVs run over the branches or plants (Neumann and Merriam 1972) potentially resulting in decreased shade, bank erosion, and reductions in large wood input. Regenerating woody vegetation could be affected by the bending and breaking of leaders with inadequate snow depth, but the effects would occur on a local scale. Snow compaction may also affect the local structure of the soil surface and thereby alter the suitability of a site for seed germination or plant development (Keddy et al. 1979; Rixen et al. 2003). Due to snow compaction, early spring growth of some plant species may be stunted or may not occur at all in areas heavily used by OSVs such as designated OSV trails. In marsh or wetland vegetation communities, OSV use has not been associated with shifts in vegetation types (Keddy et al. 1979; Wildlife Resource Consultants 2004). Further, the current and proposed OSV designated trails are underlain by existing roads and trails which are already compacted and/or disturbed and little, if any, additional impacts are expected to the vegetation. Davidson (2018) concluded that vegetation trampling from snowmobiles and potential impacts to riparian resources from OSV use would be discountable and extremely unlikely to occur with adequate snow cover.

Disturbance to soil can also be caused by OSV use, but the disturbance or damage to soil is much more likely when OSV use is concentrated and occurs under low snow conditions (Fahey and Wardle 1998). Although OSV use is avoided on bare soil or ground based on current regulations and management guidelines, OSV tracks have a capacity to break through thin snow cover, disturb soil, and create isolated ruts in the trail surface (McNamara 2018), especially after repeated passes that may displace snow cover. McNamara (2018) reported that “modern OSVs with deep lugs on their treads can easily displace 4 inches of snow each pass, depending on snow moisture amounts.” These ruts can channelize surface runoff and

the churned soil can become mobilized, leading to increases in stream sedimentation. Thus, the minimum snow depth requirements are expected to prevent or minimize damage to soil and vegetation (Davidson 2018; McNamara 2018). However, there may be some risk of inadvertent and isolated disturbance to soils when OSV use occurs during the fall or spring when snow depths vary such as on high wind-exposed ridges or southern-facing slopes and are below 4 to 6 inches in some locations along travel pathways.

McNamara (2018) reported that use of OSVs in designated areas would have a discountable effect on ground disturbance that could lead to erosion and measurable increases in sedimentation in streams based on dispersed use coupled with the assumption that operators would avoid bare soils to avoid damaging their OSV. Based on the limited amount of OSV related monitoring conducted in the Plumas National Forest, no measurable effects on aquatic resources, riparian systems, or meadows have been observed. Likewise, monitoring within the American River Ranger District of neighboring Tahoe National Forest documented similar findings (table 59), which is worth mentioning given the fact that the Tahoe National Forest has no minimum snow depth requirements for OSV use. Although the monitoring results may be biased to an unknown degree (data being collected in one area in one district during one year), the monitoring results are largely supported by the OSV related research conducted within Yellowstone National Park where OSV use is higher, more concentrated, and was still found to not impair water quality (see Olliff et al. 1999).

Table 59. Summary of off-highway and over-snow vehicle monitoring conducted in the American River Ranger District of neighboring Tahoe National Forest during 2011

Monitoring Accomplishments	Results	Were Objectives and Success Criteria Met?
American River Ranger District OSV Monitoring of Aquatic Resources	Groomed OSV routes along the Foresthill Divide were monitored for resource damage during low-snow conditions over wetlands, riparian areas, and streams. No resource damage to aquatic resources was observed. An exceptionally deep snowpack in winter/spring 2011 contributed to the protection of aquatic resources.	Yes, monitoring determined OSV use in relation to aquatic resources. No effects to aquatic resources were identified and no management actions are needed.

McNamara (2018) also reported that trail grooming does not cause substantial impacts to water quality, perennial, intermittent or ephemeral streams, wetlands, or in other bodies of water. This is because the direct project activities of trail grooming occur over an existing road and trail network and do not alter landforms or result in significant soil disturbance that would change water flow patterns or quantities of surface water runoff. Consequently, project activities including trail grooming are consistent with the Forest Plan's watershed management standards and guidelines and management prescriptions.

Ground Disturbance and Snow Compaction Effects Summary

The effects from OSV-related snow compaction and surface disturbance are more likely to occur along designated OSV trails compared to cross-country use areas because OSV use will be more concentrated on trails. Outside the designated OSV trail corridors, dispersed cross-country OSV travel is much less likely to compact snow with enough intensity and repetition to affect ground vegetation or the hydrologic regime. Although snow compaction along designated OSV trails may occur, its impact to aquatic species or their habitats is likely negligible based on, in part, snow compaction not occurring throughout an entire watershed.

Because the newly designated OSV trails would be snow-covered un-paved roads and trails, the primary pollutant of concern in forested environments is expected to be eroded sediment from unpaved roads, fill slopes, and cut slopes. According to Fulton and West (2002), roads in forested lands are the largest source

of potential non-point source pollution. Fine-grained sediment from roads and trails that reaches water bodies can potentially impair water quality.

However, McNamara (2018) concluded that this use would not impair water quality because much of the OSV use under this management strategy would occur on ungroomed or groomed trails where design features call for adequate snow cover, which would result in negligible potential for contact with bare soil, and practically no disturbance of trail and road surfaces. In general, OSV use on the groomed trail system given adequate snow coverage would not cause substantial impacts to water quality in perennial, intermittent, or ephemeral streams, in wetlands, or in other bodies of water. Adequate snow depths are snow depths that provide sufficient depth to prevent resource damage including damage to underlying vegetation, soil or ground disturbance.

Additionally, because soil disturbance is expected to only inadvertently occur along OSV designated trails in isolated locations when snow cover is less than 4 to 6 inches, we presume that measurable increases in erosion and stream sedimentation will not occur under alternatives 2 - modified, 3, and 5 based on their requiring 6- to 12-inch minimum snow depths for OSV use. We also presume that measurable increases in stream sedimentation will be minimal because the trails are largely distributed among multiple watersheds and OSV operators may voluntarily restrict use when there is less than 12 inches of snow cover in an attempt to avoid damaging their equipment.

Chemical Pollutants

Exhaust emissions deposited in the snowpack in the amounts anticipated in the Plumas National Forest from grooming equipment or OSVs on trails or OSVs traveling cross-country would be considered minor and currently do not functionally impair water quality of adjacent water bodies (McNamara 2018). In addition to exhaust emissions, grooming equipment and OSVs could potentially leave behind unburned fuel, lubrication oil, and other compounds on the top layers of snow. Some of the unburned hydrocarbons could accumulate on the snow surface and could eventually wash into streams and lakes. This could cause localized degradation of water quality.

Concentrations of pollutants from OSVs have been observed in snowmelt runoff (Arnold and Koel 2006, McDaniel and Zielinska 2014). Discharge from two-stroke snowmobile engines can lead to indirect pollutant deposition into the top layer of snow and subsequently into the associated surface and ground water (Adams 1975). Adams (1975) showed that high concentrations of lead and hydrocarbons were found in pond water adjacent to snowmobile trails during the weeks following ice melt. The study also found that juvenile brook trout had increased hydrocarbon intake and reduced stamina, from surface water and food chain feeding.

Studies conducted in the Rocky Mountain region provide some indication of the potential effects of pollution deposition from OSV use. The U.S. Geological Survey monitored the snowpack throughout the northern Rocky Mountains over a period of several years to measure regional water quality trends as well as the effect of OSV use. The monitoring showed a relationship between OSV use and pollutant deposition in the snowpack, but not more than negligible to minor quantities of OSV-related pollution in snowmelt. Detectable vehicle-related pollution in snowmelt was found to be in the range of background or near-background levels (Ingersoll et al. 1997; Ingersoll 1999).

A study in Yellowstone National Park analyzed snowmelt from four test locations adjacent to roadways and parking lots heavily used by OSVs between Yellowstone's West Entrance at West Yellowstone, Montana, and the Old Faithful visitor area. No cross-country OSV use was allowed, and OSVs were concentrated on one main trail in to the park. The purpose of the study was to evaluate whether increased snowmobile use within the Park was creating increased potential for emissions to enter pristine surface

waters. Specific objectives were to (1) examine snowmelt runoff for the presence of specific volatile organic compounds (VOCs), (2) determine if concentrations of any VOCs exceed safe drinking water criteria, and (3) predict the potential for impacts by VOCs on the fauna of streams near roads heavily used by snowmobiles in the park. In spring 2003 and 2004, water samples were collected and tested. In situ water quality measurements (temperature, dissolved oxygen, pH, specific conductance, and turbidity) were collected; all were found within acceptable limits. Five VOCs were detected (benzene, ethylbenzene, m- and p-xylene, o-xylene, and toluene). The very low concentrations were found to be below U.S. Environmental Protection Agency criteria and guidelines for the VOCs analyzed and were below levels that would adversely impact aquatic ecosystems (Arnold and Koel 2006).

Arnold and Koel (2006) reported that the number of snowmobiles entering the single trailhead in the Yellowstone National Park was 47,799 and 22,423 in 2003 and 2004, respectively. The estimated seasonal day use of OSV trails across the Plumas National Forest is around 40,000 per year. These visitations are spread across multiple trailheads and trail systems and do not all occur in the same location. As a result, over-snow vehicle seasonal use levels at any Plumas National Forest trailhead or trail system are considerably less than over-snow vehicle use that occurred in the Yellowstone National Park study area. Thus, we presumed that water quality is not and will not be impaired by chemical contamination from over-snow vehicles under existing management or the action alternatives.

Pollutants Effects Summary

Chemical contaminants deposited by over-snow vehicles is generally not expected to result in the harming of any federally listed or sensitive aquatic animal species occurring in the Plumas National Forest based on the studies described and the findings related to water quality impacts. Lastly, the risk of pollution from the action alternatives is not any higher than what exists under current over-snow vehicle management regulations. Therefore, the level of effect to federally listed or sensitive aquatic animal species from OSV pollutants is expected to be minimal.

Critical Aquatic Refuges

The primary management goal for critical aquatic refuges (CAR) is to preserve, enhance, restore or connect habitats distributed across the landscape for sensitive or listed species to contribute to their viability and recovery. In many cases, refuges support the best remaining populations of native fish, amphibian, and plant species with substantially reduced distributions elsewhere in the Sierra Nevada. They provide habitat for native fish, amphibians and aquatic invertebrate populations. Remnant plant and animal populations in aquatic communities are maintained and restored. Streams in meadows, lower elevation grasslands, and hardwood ecosystems have vegetation and channel bank conditions that approach historic potential and water quality meets State stream standards.

While each of the alternatives would affect CAR (table 60), the magnitude of those effects are expected to be negligible for the reasons outlined above in the preceding paragraphs.

Table 60. Acres of critical aquatic refuges within the project's effect boundary for each project element among the alternatives

Project Elements	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Designated Cross-country OSV Use Areas	219,008	162,678	102,612	223,102	122,450
OSV Trails	1,843	2,063	1,522	4,026	1,522

Effects to Aquatic Species

California red-legged frog (*Rana draytonii*)

Direct and Indirect Effects

While there is relatively little risk of direct effects while individuals are overwintering or in their breeding habitats, effects could occur in the spring when the adults disperse over snow to their breeding sites. Bulger et al. (2003) found that migrating adult California red-legged frog may make short or long distance movements (650 feet to 1.7 miles) between aquatic sites during the wet season. During that time, there could be an increased risk of frogs being affected by collisions and noise disturbances where OSV use is concentrated within their occupied habitat along designated trails, in high-use cross-country OSV areas, or at stream crossings. If OSVs collide with or come in close proximity to adult California red-legged frog, individuals can become stressed, injured, and/or killed from the contact with or noise disturbance from the OSVs traveling along designated trails (Bowles 1995; Gabrielsen and Smith 1995; Lima et al. 2015). This would result in the direct harassment, harm, injury or death of individuals from the designated OSV trail activities.

However, the probability of direct effects to the species is believed to be unlikely for the following reasons:

1. California red-legged frogs breed at temperatures above freezing and in snow free areas where OSV use is unlikely to occur. Populations are typically found at elevations below 3,500 feet.
2. California red-legged frogs typically breed in snow free areas in ponds and stream pools exceeding 0.7-meter depths in areas away from any roads or trails and where OSV use would generally occur.
3. Cross-country OSV operators generally avoid travel over bare ground or soil because it is prohibited and can damage their machines.
4. Snowfall records indicate that California red-legged frog locations typically do not have adequate snow depths or durations to support OSV use.
5. Forest Service and California Department of Fish and Wildlife databases indicate that where the species is present, its relative abundance is low further limiting the potential for negative direct effects.

Likewise, indirect effects may occur in concentrated OSV-use areas, as there would be an increased risk that potentially suitable habitat may be affected. However, OSV use is not likely to demonstrably affect potentially suitable habitat. No new stream crossings are proposed under any of the alternatives. Although up to approximately 195,000 acres (71 percent) of potentially suitable habitat in the Plumas National Forest may be affected by OSV use among the alternatives (table 61), McNamara (2018) concluded that water quality would not be impaired by any of the alternatives. Therefore, it was expected that OSV-related pollutant concentrations or sedimentation would be insignificant and would not impair potentially suitable habitat. Furthermore, while indirect effects from pollution and surface disturbance could present some risk of isolated negative effects along designated OSV trails, the risk would be negligible. Ground disturbance would be negligible because off-trail OSV use would generally be dispersed and would not result in high concentrations of OSV use on bare soil. Also, travel over bare soil can damage machines, so is generally avoided by operators. With adequate minimum snow levels, this management strategy would result in no more than incidental and localized soil erosion relative to current

management, and therefore, none of the action alternatives would create any additional water quality impacts to streams or water bodies by introducing sediment in water runoff.

Table 61. Acres of potentially suitable habitat for California red-legged frog possibly affected by the proposed project elements under each alternative

Project Elements	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Designated Cross-country OSV-use Areas	191,210	102,550	29,108	194,204	26,460
OSV Trails	1,087	1,261	1,054	2,617	1,054

Additionally, the implementation of water quality best management practices outlined in Volume II of the FEIS (appendix C) would further ensure controls to avoid resource damage within the Plumas National Forest. Planned monitoring procedures by recreation and forest staff, law enforcement, and Investigation Officers will further add to a better understanding of the relation between OSV use and aquatic habitats, and help facilitate better resource protection. As a result, possible effects to potentially suitable California red-legged frog habitat are expected to be discountable.

Critical Habitat

There are a total of 7,822 acres of California red-legged frog critical habitat within the Plumas National Forest (figure 9) and these acres are contained within the BUT-1 Hughes Place Pond and YUB-1 Little Oregon Creek critical habitat subunits. Currently, approximately 5,414 acres (70 percent) of critical habitat may be affected by authorized OSV use within the Plumas National Forest (table 62). Conversely, there are no designated OSV trails or cross-country areas within California red-legged frog designated critical habitat under alternatives 2 - modified, 3, and 5 (table 62). Under these action alternatives, there would likely be a discountable positive effect on aquatic breeding or non-breeding habitat (PCEs 1 and 2), upland habitat (PCE 3), or dispersal habitat (PCE 4) within California red-legged frog critical habitat designated areas. Although alternative 4 may affect more designated critical habitat acres relative to current management, it was expected that designated OSV use would not impair aquatic breeding or non-breeding habitat (PCEs 1 and 2), upland habitat (PCE 3), or dispersal habitat (PCE 4).

Table 62. Acres of designated critical habitat for California red-legged frog possibly affected by the proposed project elements under each alternative

Project Elements	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Designated Cross-country OSV Use Areas	5,414	0	0	6,238	0
Designated OSV Trails	0	0	0	0	0

Cumulative Effects

Historically, California red-legged frog have been affected by habitat degradation caused by increases in human-caused development and activities including the development of roads, urbanization, agriculture, mining, timber harvest, and non-native invasive species (USFWS 2002). There are many past, on-going and reasonably foreseeable projects identified by the Plumas National Forest which may degrade potentially suitable habitat by causing ground disturbance (sedimentation), affecting riparian vegetation communities and introducing pollutants to surface waters within the forest. These activities include, but are not limited to, livestock grazing, timber harvest, fuels reduction, woodcutting activities, wildfire suppression, and recreation including camping, non-motorized winter recreational activities, and use of

roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. In general, the Forest Service uses BMPs in compliance with the Clean Water Act to minimize water quality impacts. Further, the Plumas National Forest monitors roads and trails used for OSVs and implements BMPs as needed to control erosion and other effects. Projects whose BMP monitoring shows results that are not effective are addressed and improved.

While the risk of degrading California red-legged frog habitat is greatest under alternatives 2 and 4 (just over 190,000 acres), none of the alternatives would result in measurable, irreversible or irretrievable effects to soil, water, aquatic, or riparian resources (McNamara 2018). There would only be incidental and isolated ground disturbance, negligible risk of vegetation damage, and negligible effects from exhaust pollution. Because none of the alternatives are expected to have probable direct or measurable indirect effects on the California red-legged frog and its habitat, the alternatives will likely have no measurable negative cumulative effects on the viability of the California red-legged frog or its habitat in combination with ongoing, future, and past activities.

Sierra Nevada yellow-legged frog (*Rana sierrae*)

Direct and Indirect Effects

There are 107,926 acres of potentially suitable Sierra Nevada yellow-legged frog habitat within the Plumas National Forest (figure 10). Potentially suitable habitat in and outside of designated critical habitat was assumed to be occupied based on the spatial extent of historical detections. Designated OSV trails and cross-country areas occur within suitable (presumed occupied) habitat and historically occupied habitat under each of the alternatives (table 63). In general, the action alternatives (alternatives 2 - modified, 3, 4, and 5) would increase the amount of suitable habitat that would be potentially affected by OSV trails (table 63).

Direct effects from over-snow vehicle related collisions and noise disturbance could occur when adult Sierra Nevada yellow-legged frogs disperse over snow during the spring thaw period within occupied habitat (Pope 1999; Pope and Matthews 2001; Vredenburg et al. 2005). If OSVs collide with or come in close proximity to adult Sierra Nevada yellow-legged frogs, individuals can become stressed, injured, and/or killed from the contact with or noise disturbance from the OSVs traveling along designated trails (Bowles 1995; Gabrielsen and Smith 1995; Lima et al. 2015). This would result in the direct harassment, harm, injury or death of individuals from the designated OSV trail related activities. However, the risk of frogs being affected by collisions and noise disturbances from concentrated OSV use along designated trails or at stream crossings was considered to be low while individuals overwinter and during the breeding season. In general, individuals of all life stages overwinter in deep lakes or pools with undercut banks that provide cover (Martin 1992) and breeding primarily occurs after the spring thaw period (Vredenburg et al. 2005). Further, the risk of direct effects from cross-country OSV use activities was considered to be discountable because cross-country OSV use would likely be dispersed.

Alternatives 1 (no-action) and 4 would have the greatest potential effects on potentially suitable (assumed occupied) habitat within the project area. Under alternatives 1 and 4 approximately 76,000 acres or 71 percent of the potentially suitable habitat within the Forest would remain open to public OSV use (table 63). Additionally, under alternative 1 there would be no change to the way the Forest Service currently manages public OSV use.

Table 63. Acres of potentially suitable habitat for Sierra Nevada yellow-legged frog possibly affected by the proposed project elements under each alternative

Project Elements	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Designated Cross-country OSV Use Areas	75,627	60,781	39,917	76,160	39,829
Designated OSV Trails	598	787	687	1,621	687

In contrast, alternatives 3 and 5 would reduce the amount of potentially suitable habitat affected by OSV use to roughly 40,000 acres, which equates to a 47 percent reduction compared to the no-action (alternative 1). Alternative 2 - modified would also reduce the acres of habitat affected, but not as drastically (approximately 20 percent reduction relative to alternative 1). Additionally, each of the action alternatives (alternatives 2 - modified, 3, 4, and 5) would: (1) prohibit OSV use across open or flowing water, (2) implement the recommended project design criteria and mitigation measures, and (3) implement the prescribed monitoring regime. Additionally, alternatives 2 - modified and 5 would also prohibit OSV use within 50 feet of flowing water in critical habitat areas for Sierra Nevada yellow-legged frog.

While each of the action alternatives (alternatives 2 - modified, 3, 4, and 5) would increase the acres of potentially suitable (assumed occupied) Sierra Nevada yellow-legged frog habitat affected by designated trails, the reality is that existing corridors (i.e., county, State, and National Forest System roads and trails) will simply be designated and identified as official OSV trails and access to the remainder of the network of roads and trails would be prohibited, thereby limiting the overall effects of OSV use in those areas to between 687 and 1,621 acres (table 63). Because no new trails or roads are proposed for construction and no new areas are proposed for opening to cross-country OSV access relative to the no-action alternative (alternative 1), the effects on individual Sierra Nevada yellow-legged frogs should be limited (i.e., no new habitat and resultantly no new individuals would be affected). For example, it can reasonably be assumed that individuals currently over-wintering in or near newly designated trail corridors (i.e., existing roads) have already been exposed and are possibly habituated to the OSV use in winter (Bowles 1995) because those areas are already active OSV corridors. Similarly, individuals over-wintering in newly designated cross-country OSV-use areas have likely already been exposed and may possibly be habituated to OSV activities in winter because those areas are already currently open to cross-country OSV use.

McNamara (2018) concluded that water quality would not be impaired by any of the alternatives. Therefore, it is expected that OSV-related pollutant concentrations or sedimentation would be insignificant and would not impair suitable frog habitat or compromise the health of individual frogs. In general, cross-country OSV use during the winter is not expected to result in measurable habitat disturbance for any alternative. However, alternatives 3 and 5 would be the most protective of the species and their habitat with proposed minimum snow depth requirements between 12 and 24 inches. Greater snow depths reduce the effects of OSVs compacting or disturbing riparian vegetation, soils, and/or snow. They will also provide additional noise attenuation and effectively shortening the season of use thus reducing emissions, etc. Further, designated OSV trails among the alternatives would be underlain by existing roads or trails which likely do not provide suitable habitat for the Sierra Nevada yellow-legged frog.

Furthermore, the magnitude of effects from the action alternatives (alternatives 2 - modified, 3, 4, and 5) are expected to be very low as compared to the no-action alternative (alternative 1) for the following reasons:

1. Implementation of the proposed water quality best management practices outlined in Volume II of the Draft Environmental Impact Statement (appendix C) would ensure controls to avoid resource damage. These would not be implemented under the no-action alternative.
2. Monitoring by recreation and forest staff, law enforcement, and Investigation Officers would be implemented in connection with each of the action alternatives and will further add to a better understanding of the relation between OSV use and aquatic habitats, and help facilitate better resource protection. Accordingly, the foreseeable effects to aquatic habitat are expected to be discountable.
3. Greater minimum snow depths for off-trail, cross-country OSV use would be required by each of the alternatives resulting in less risk to aquatic habitat and individuals during snowmelt.

Based on the spatial analysis, we believe that alternatives 1 (no-action) and 4 would present the greatest potential for effects to Sierra Nevada yellow-legged frogs and their potentially suitable habitat within the project area. In contrast, the risk of degrading Sierra Nevada yellow-legged frog habitat is the lowest under alternatives 3 and 5 based on having the least amount of potentially suitable habitat that could be affected by designated OSV use and requiring the deepest minimum snow depths (12 to 24 inches).

Critical Habitat

There are a total of 66,340 acres of critical habitat within the Plumas National Forest (figure 10) and these acres are contained within the 1A Morris Lake, 1B Bean Creek, 1C Deanes Valley, 1D Slate Creek, 2A Boulder/Lone Rock Creeks, and 2B Gold Lake subunits.

Each of the alternatives have designated OSV trails and cross-country areas in potentially occupied designated critical habitat (table 64). Alternatives 1 and 4 would affect the most designated critical habitat (approximately 70 percent of the total), while alternatives 3 and 5 would affect the least (between 35 and 48 percent of the total).

Table 64. Acres of designated critical habitat for Sierra Nevada yellow-legged frog possibly affected by the proposed project elements under each alternative)

Project Elements	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Designated Cross-country OSV Use Areas	46,465	40,750	22,926	46,674	31,809
Designated OSV Trails	1,048	1,015	824	1,435	824

As described earlier, it is unlikely that over-snow vehicle use under the proposed action would measurably affect the Sierra Nevada yellow-legged frog's aquatic or upland habitat. Under the action alternatives (alternatives 2 - modified, 3, 4, and 5), the use of over-snow vehicles during the winter is not expected to result in any measurable habitat disturbance because of the reduction of OSV-use areas in designated critical habitat, implementation and enforcement of minimum snow depth requirements, implementation of water quality best management practices, implementation of mitigation measures including prohibiting cross-country OSV use within 50 feet of flowing water in critical habitat areas for Sierra Nevada yellow-legged frog and prohibiting OSV use across open or flowing water, and implementation of effectiveness monitoring. As a result, there would be no measurable effect of the proposed action on aquatic habitat for breeding and rearing (PCE 1), nonbreeding habitat including overwintering habitat (PCE 2), or upland habitat (PCE 3) within Sierra Nevada yellow-legged frog critical habitat designated areas occurring in the Plumas National Forest.

Cumulative Effects

Historically, Sierra Nevada yellow-legged frogs have been affected by diseases and habitat degradation attributed to non-native invasive species, agriculture, grazing, timber harvest, and urbanization (USFWS 2002). Wildfires are unforeseeable events that may directly impair water quality until vegetation recovers. Additionally, a changing climate may affect the duration of water availability in meadow habitat due to more frequent droughts and shifts in precipitation type (rain versus snow) in the Sierra Nevada. This could decrease the quantity and quality of aquatic habitat depending on many factors. However, it is impossible to quantify changes in habitat or populations in the project area based on the uncertainty of exactly where, what, and when climatic changes could occur in the project area. Nevertheless, given the minimal magnitude of direct and indirect effects, we do not believe that the combined effects of this project in relation to climate change would have substantial negative effects to suitable Sierra Nevada yellow-legged frog habitat.

There are many past, ongoing, and reasonably foreseeable projects identified by the Plumas National Forest that may degrade the species habitat by causing ground disturbance (sedimentation), affecting riparian vegetation communities, introducing pollutants to surface waters within the forest, and introducing additional non-native fish. These activities include, but are not limited to, state fish stocking, livestock grazing, timber harvest, fuels reduction, wildfire suppression, and recreation including camping, non-motorized winter recreational activities, and use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. In general, most of the potential negative effects to species and habitats are mitigated (reduced magnitude or duration of effect) through management requirements at the individual project planning scale. Monitoring during and after project implementation helps identify the need for more stringent mitigation measures when commonly implemented management requirements do not adequately protect habitat or individuals. Similarly, the Forest Service uses BMPs for compliance with the Clean Water Act to minimize water quality impacts. These practices are monitored for a suite of Forest Service program areas to record whether the measures were implemented and effective. Follow up actions are then prescribed for areas where the practices were insufficiently implemented. Further, the Plumas National Forest monitors roads and trails used for OSVs and implements BMPs as needed to control erosion and other effects.

Despite habitat occurring in the effect boundaries for every alternative, the risk of negative cumulative effects would be negligible. As a result of the 12-inch minimum snow depth required for cross-country use under each of the action alternatives (alternative 2 - modified, 3, 4, and 5), there would continue to be only incidental and isolated ground disturbance. Moreover, the 18-inch depth requirement under alternative 3 would further reduce the potential for ground disturbance because there would be no chance that bare soil would be present during OSV operations. There would be negligible effects from exhaust emissions stored in snowpack, and low risk of damage to vegetation or other direct and indirect effects as discussed previously. Each alternative would provide adequate snow cover to protect soils and water resources, and would protect vegetation in riparian areas. They would also be consistent with Forest Plan Direction standards and guidelines and not result in irreversible or irretrievable effects to soil, water, or riparian resources.

Since all of the alternatives are expected to have limited direct and minimal indirect effects on the Sierra Nevada yellow-legged frog and its habitat, there will likely be no measurable negative cumulative effects on suitable habitat, the viability of the species, or its critical habitat in combination with ongoing, future, and past activities occurring on Federal, state, or private lands.

Foothill yellow-legged frog (*Rana boylei*)

Direct and Indirect Effects

Like the California red-legged frog and Sierra Nevada yellow-legged frog, there may be an increased risk of individual foothill yellow-legged frogs being affected by collisions and noise disturbances where OSV use is concentrated along designated trails, in high use cross-country OSV areas, or at stream crossings. If OSVs collide with or come in close proximity to adult frogs, individuals could become stressed, injured, and/or killed from the contact with or noise disturbance from the OSVs traveling along designated trails (Bowles 1995; Gabrielsen and Smith 1995; Lima et al. 2015). This would result in the **direct harassment, harm, injury or death of individuals** from the designated OSV trail activities.

However, foothill yellow-legged frogs are a more highly aquatic (water-dependent) species than the previous two. Accordingly, the probability of direct effects is largely discountable. Individuals are typically found in partially shaded rocky streams and are highly dependent on water during each life-stage (Hayes et al. 2016). Adults remain near (within 39 feet or 12 meters from) the stream channel and use watercourses as movement corridors during the spring when moving to and away from breeding sites (Van Wagner 1996; Wheeler and Welsh 2008; Bourque 2008; Hayes et al. 2016). Although overwintering behavior is poorly understood, adults are still commonly found in water within tributaries prior to being found in mainstem streams or rivers. In general, OSVs would have to travel in and through water to collide with individuals occurring and overwintering in streams. This was considered to be highly unlikely based on OSV use being prohibited over open or flowing waters coupled with the assumption that OSV operators would avoid riding in streams to prevent damaging their OSVs and ensure compliance with existing regulations (e.g., 36 CFR part 261.15).

A total of 90,292 and 91,618 acres, respectively, of suitable habitat for the species would potentially be affected by designated cross-country OSV use associated with alternatives 1 and 4 (table 65), which equates to approximately 68 percent of suitable habitat in the project area. In contrast, alternatives 3 and 5 would reduce the amount of potentially suitable habitat affected by OSV use to roughly 32,459 and 33,046 acres, respectively, which equates to over a 70 percent reduction from alternative 1 (no action). Alternative 2 - modified would also reduce the acres of habitat effected but not as drastically (approximately a 35 percent reduction relative to alternative 1).

Table 65. Acres of potentially suitable habitat for the foothill yellow-legged frog possibly affected by the proposed project elements under each alternative

Project Elements	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Designated Cross-country OSV Use Areas	90,222	58,624	32,308	91,355	32,816
Designated OSV Trails	483	635	557	1,500	557

Similar to the indirect effects described for the California red-legged frog and Sierra Nevada yellow-legged frog, no negative effects are expected to result from OSV-related pollutants or sedimentation at stream crossings, or from the compaction or disturbance of riparian vegetation, soils, and/or snow (McNamara 2018). In general, OSV trail use would affect only 1 percent of the suitable habitat in the project area and cross-country OSV use during the winter is not expected to result in measurable aquatic habitat disturbance for any alternative.

Cumulative Effects

Historically, the foothill yellow-legged frog has been affected by habitat degradation attributed to water development and diversion, urbanization, non-native species, and mining (Hayes et al. 2016). Wildfires are unforeseeable events that may directly impair water quality until vegetation recovers. Additionally, a changing climate may result in more frequent and severe droughts in the Sierra Nevada, which may potentially decrease the quantity and quality of aquatic habitat. These could cumulatively contribute to the direct and indirect effects to the foothill yellow-legged frog by decreasing suitable habitat and stressing existing populations (Hayes et al 2016). However, it is impossible to quantify changes in habitat or populations in the project area based on the uncertainty of exactly where, what, and when climatic changes could occur in the project area.

There are many past, on-going and reasonably foreseeable projects identified by the Plumas National Forest which may degrade the species' habitat by causing ground disturbance (sedimentation), affecting riparian vegetation communities and introducing pollutants to surface waters within the forest. These activities include, but are not limited to, ancillary snow plowing at the established OSV trailheads, livestock grazing, timber harvest, fuels reduction, woodcutting activities, wildfire suppression, non-motorized winter recreational activities, and use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. In general, the Forest Service uses BMPs in compliance with the Clean Water Act to minimize water quality impacts. Further, the Plumas National Forest monitors roads and trails used for OSVs and implements BMPs as needed to control erosion and other effects. Projects whose BMP monitoring shows results that are not effective are addressed and improved.

Although the risk of degrading foothill yellow-legged frog habitat is greatest under alternative 1 and 4, none of the alternatives would result in measurable, irreversible or irretrievable effects to soil, water, aquatic, or riparian resources (McNamara 2018). There would be only be incidental and isolated ground disturbance, negligible risk of vegetation damage, and negligible effects from exhaust pollution. Because all the alternatives are expected to have minimal direct or indirect effects on the foothill yellow-legged frog and its habitat, the alternatives will likely have no measurable negative cumulative effects on the viability of the species or its habitat in combination with ongoing, future, and past activities.

Western pond turtle (*Actinemys marmorata*)

Direct and Indirect Effects

Within the Plumas National Forest, we presumed that suitable habitat was occupied and all alternatives would have designated OSV trails and cross-country areas within suitable habitat (table 66). Direct effects from OSV-related collisions and noise disturbance “may impact” adult western pond turtles while overwintering. Adults can move upland following the first winter storm in November or December. Adults have been observed to overwinter under leaf litter or fine soil in locations with level or upland slopes containing dense understory vegetation (Bury and Germano 2008). Therefore, adults overwintering under snow on roads and elsewhere can be harassed, injured, or killed from designated OSV use occurring overtop occupied habitat or in close proximity.

Table 66. Acres of potentially suitable habitat for western pond turtle potentially affected by the proposed project elements under each alternative

Project Elements	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Designated Cross-country OSV Use Areas	196,751	76,166	1,399	200,173	0
Designated OSV Trails	138	207	157	994	157

In general, a total of 196,757 and 200,275 acres of suitable habitat for the species could potentially be affected by designated OSV use associated with alternatives 1 and 4, respectively (table 66), which equates to approximately 70 percent of suitable habitat in the Plumas National Forest. Considerably less suitable habitat (between 157 and 75,268 acres) would be affected by designated OSV use associated with alternatives 2 - modified, 3, and 5, which equates to more than a 60 percent reduction in potentially affected habitat relative to the no action alternative (alternative 1). Although the risk of direct effects was considered high for areas heavily used by OSVs such as the designated trails, OSV trails use among the alternatives would affect a negligible amount of suitable habitat (less than 1 percent of the suitable habitat in the Plumas National Forest). Further, the alternatives pose an overall low risk to individuals because snowpack is rarely present with sufficient depth or duration to allow for extensive OSV use at lower elevations near known occupied sites (i.e., appropriate conditions would occur only every few years and for up to a week). Overwintering adults tend to overwinter in dense brush where it would be unlikely for operators to access. Also, overwintering occurs more commonly on south-facing slopes where the persistence of the snowpack would further reduce the potential for direct impacts to individuals.

Similar to the effects described for the California red-legged frog, it is expected that OSV-related pollutant concentrations or sedimentation would be insignificant and would not impair or degrade suitable western pond turtle habitat. For all alternatives, OSV trail use would affect only a negligible amount of suitable habitat (less than 1 percent of the suitable habitat in the Plumas National Forest). Further, cross-country OSV use during the winter is not expected to result in measurable aquatic habitat disturbance for any alternative because OSV use would be dispersed, not occur on bare soil or ground based on current regulations, and not compact snow with enough intensity and repetition to measurably affect ground vegetation or the hydrologic regime (Davidson 2018; McNamara 2018).

Cumulative Effects

Historically, western pond turtles have been affected by habitat degradation attributed to logging, mining, agriculture (e.g., grazing), road development, urbanization, ground water pumping, and water recreation activities (Buskirk 2002; Lovich and Meyer 2002). Wildfires are unforeseeable events that may directly impair water quality until vegetation recovers. Additionally, a changing climate may result in more frequent and severe droughts in the Sierra Nevada, which may potentially decrease the quantity and quality of aquatic habitat. These could cumulatively contribute to the direct and indirect effects to the western pond turtle by decreasing suitable habitat and stressing existing populations. However, it is impossible to quantify changes in habitat or populations in the project area based on the uncertainty of exactly where, what, and when climatic changes could occur in the project area.

There are many past, on-going and reasonably foreseeable projects identified by the Plumas National Forest which may degrade the species' habitat by causing ground disturbance (sedimentation), affecting riparian vegetation communities and introducing pollutants to surface waters within the forest. These activities include, but are not limited to, livestock grazing, timber harvest, fuels reduction, woodcutting activities, wildfire suppression, non-motorized winter recreational activities, and use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. In general, the Forest Service uses BMPs in compliance with the Clean Water Act to minimize water quality impacts. Further, the Plumas National Forest monitors roads and trails used for OSVs and implements BMPs as needed to control erosion and other effects. Projects whose BMP monitoring shows results that are not effective are addressed and improved.

Although the risk of degrading Western pond turtle habitat is greatest under alternative 1 and 4, and lowest under alternative 3 and 5, none of the alternatives would result in measurable, irreversible or irretrievable effects to soil, water, aquatic, or riparian resources (McNamara 2018). Despite habitat

occurring in the effect boundaries for every alternative, there would be only be incidental and isolated ground disturbance, negligible risk of vegetation damage, and negligible effects from exhaust pollution. Because all the alternatives are expected to have minimal direct or indirect effects on the western pond turtle and its habitat, the alternatives will likely have no measurable negative cumulative effects on the viability of the species or its habitat in combination with ongoing, future, and past activities.

Hardhead (*Mylopharodon conocephalus*)

Direct and Indirect Effects

Proposed OSV trails and cross-country areas are expected to have “no impact” on hardhead or their habitat. The direct effects to hardhead from designated OSV use would be nonexistent for alternatives 3 and 5, and discountable for all other alternatives. No potentially suitable habitat for hardhead occurred in the effect boundary of designated OSV trails or cross-country areas under alternatives 3 and 5 (table 67). Further, OSVs would have to travel in and through water to collide with individuals (Lima et al. 2015), which was considered highly unlikely based on the assumption that OSV operators would avoid riding through open water to prevent damaging their machines and to comply with existing regulations (e.g., 36 CFR part 261.15). Lastly, practically no potentially suitable habitat for hardhead occurred in the effect boundary of designated OSV trails, reducing the risk of individuals being harassed by noise generated from concentrated OSV use.

Table 67. Miles of potentially suitable habitat (stream miles) for hardhead potentially affected by the proposed project elements under each alternative

Project Elements	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Designated Cross-country OSV Use Areas	80	12	0	81	0
Designated OSV Trails	0	<1	0	1	0

Spatially, alternatives 1 and 4 would have the greatest potential effects on potentially suitable (assumed occupied) habitat within the project area (table 67). In contrast, alternatives 3 and 5 would have the least amount (zero river miles) of potentially suitable hardhead habitat that would be affected by OSV cross-country and trail use. Alternative 2 - modified would result in an 85 percent reduction in the amount of potentially suitable hardhead habitat that could be affected by designated OSV use relative to alternative 1.

In those areas where hardhead would be exposed to OSV use under alternatives 1, 2 - modified, and 4, no indirect effects would be expected. As discussed for the previous species, it is expected that OSV-related pollutant concentrations or sedimentation would be insignificant and would not impair or degrade suitable habitat. In general, OSV trail use among the alternatives would have no or negligible direct or indirect effects on the suitable habitat for hardhead (table 67). Further, cross-country OSV use during the winter is not expected to result in measurable aquatic habitat disturbance for any alternative because OSV use would be dispersed, not occur on bare soil or ground based on current regulations, and not compact snow with enough intensity and repetition to measurably affect ground vegetation or the hydrologic regime (Davidson 2018; McNamara 2018).

Cumulative Effects

Historically, hardhead have been affected by dams and diversions, agriculture, urbanization, mining, road development, management related eradication, and introduced non-native species (Moyle et al. 2015).

There are many past, ongoing, and reasonably foreseeable projects identified by the Plumas National Forest which may further degrade the species' habitat by causing ground disturbance (sedimentation), affecting riparian vegetation communities and introducing pollutants to surface waters within the forest. These activities include, but are not limited to, ancillary snow plowing at the established OSV trailheads, livestock grazing, timber harvest, fuels reduction, woodcutting activities, wildfire suppression, non-motorized winter recreational activities, and use of roads by wheeled vehicles during the season of overlap between OSVs and wheeled vehicles. In general, the Forest Service uses BMPs in compliance with the Clean Water Act to minimize water quality impacts. Further, the Plumas National Forest monitors roads and trails used for OSVs and implements BMPs as needed to control erosion and other effects. Projects whose BMP monitoring shows results that are not effective are addressed and improved.

While the risk of degrading hardhead habitat is highest under alternative 1 (no action), none of the alternatives would result in measurable, irreversible or irretrievable effects to soil, water, aquatic, or riparian resources. There would be only be incidental and isolated ground disturbance, negligible risk of vegetation damage, and negligible effects from exhaust pollution under these alternatives (McNamara 2018). Therefore, none of the alternatives would be expected to have any measurable negative cumulative effects on the viability of the hardhead or its habitat in combination with ongoing, future, and past activities.

Federally Listed Species Determinations

California red-legged frog (*Rana draytonii*)

The proposed OSV designated areas among all the alternatives may adversely affect individual California red-legged frogs because OSVs could harass or collide with adults traveling over ice or snow during the early portion of the breeding season when there is still some snow on the ground but also snow-free ground and water. However, the probability of vehicle collision is likely low because almost all of the authorized activities would occur at a time of year when amphibians are likely overwintering. In general, the species' breeding season occurs when temperatures are above freezing (during or shortly after snowmelt) and breeding occurs in snow-free areas where OSV use is unlikely to occur. In general, OSV use is not expected to result in any measurable changes to soils, vegetation, or hydrology and, thereby, the species' habitat. Under all of the alternatives, the use of OSVs is prohibited over areas with inadequate snow depth or exposed ground that would cause resource damage. In addition, each of the alternatives would require adequate minimum snow depths under which OSV use can operate that would provide further protection to the underlying ground and thereby frog habitat. Therefore, it is our determination that the alternatives “**may affect, likely to adversely affect**” the California red-legged frog based on the potential to directly impact individuals moving over snow or ice during the early portion of the breeding season.

Critical Habitat

Designated critical habitat for the California red-legged frog is located within the project area and could be directly affected by the OSV area designations prescribed by all of the alternatives (table 61). However, none of the alternatives are expected to measurably adversely affect areas designated as critical habitat for the species because designated OSV use would be prohibited on bare ground, there would be only be incidental and isolated ground disturbance, negligible risk of vegetation damage, and negligible effects from exhaust pollution within the potentially affected habitats (Davidson 2018; McNamara 2018). Therefore, it is our determination that the alternatives “**may affect, not likely to adversely affect**” the designated critical habitat for the California red-legged frog.

Sierra Nevada yellow-legged frog (*Rana sierrae*)

The proposed OSV designated areas among all the alternatives may adversely affect individual Sierra Nevada yellow-legged frogs for the same reasons as identified above for the California red-legged frog. Therefore, it is our determination that the alternatives “**may affect, likely to adversely affect**” the Sierra Nevada yellow-legged frog based on the potential to directly impact individuals moving over snow or ice during the early portion of the breeding season.

Critical Habitat

Designated critical habitat for the Sierra Nevada yellow-legged frog is located within the project area and could be affected by the OSV area designations prescribed by all of the alternatives (table 64). However, as previously described, none of the alternatives are expected to adversely affect areas designated as critical habitat for the Sierra Nevada yellow-legged frog. Additionally, each of the action alternatives (alternatives 2 - modified, 3, 4, and 5) would: (1) prohibit OSV use across open or flowing water, (2) implement the recommended project design criteria and mitigation measures, and (3) implement the prescribed monitoring regime. Furthermore, alternatives 2 and 5 would also prohibit OSV use within 50 feet of flowing water in critical habitat areas for Sierra Nevada yellow-legged frog. Therefore, it is our determination that the alternatives “**may affect, not likely to adversely affect**” the critical habitat designated for the Sierra Nevada yellow-legged frog.

Sensitive Species Determinations

Foothill yellow-legged frog (*Rana boylei*)

The proposed OSV designated areas among all the alternatives may adversely affect individual foothill yellow-legged frogs for the same reasons as identified above for the California red-legged frog and Sierra Nevada yellow-legged frog. While it is recognized that the potential for those effects is likely far lower for this highly aquatic species, it is our determination that the alternatives “**may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area**” based on the proximity to known occupied sites and the potential to directly impact individual foothill yellow-legged frogs.

Western pond turtle (*Actinemys marmorata*)

Within the Plumas National Forest, we assumed that suitable western pond turtle habitat was occupied and consisted of relatively low abundances in the majority of locations. All alternatives had designated OSV trails and cross-country areas within assumed occupied habitat (table 66). Direct effects from OSV-related collisions and noise disturbance could harass or injure adult western pond turtles while overwintering underneath snow. Although it is unlikely that any of the alternatives would result in the physical injury of individuals, they could cause stress based on noise disturbance. Further, there would only be incidental and isolated ground disturbance, negligible risk of vegetation damage, and negligible effects from exhaust pollution within the potentially affected habitat. In general, the proposed designated OSV use among the alternatives is not expected to result in any measurable changes to soils, vegetation, or hydrology and thereby the species' habitat. Therefore, it is our determination that the alternatives “**may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area**” for the western pond turtle.

Hardhead (*Mylopharodon conocephalus*)

Alternatives 3 and 5 are not proposing any OSV trails or cross-country use areas within potentially suitable (assumed occupied) hardhead habitat and no designated OSV trails are proposed near any potentially occupied waters under any of the alternatives. Accordingly, there would be no direct, indirect,

or cumulative effects to hardhead or their habitat. It is, therefore, our determination that alternatives 3 and 5 would have “**no impact**” on hardhead or their habitat.

Under alternatives 1 and 4 cross-country OSV areas would affect approximately 81 miles of potentially suitable hardhead habitat. Likewise, alternative 2 - modified would affect nearly 12 miles of potentially suitable hardhead habitat. While it is recognized that potential direct, indirect, or cumulative effects in those areas are highly unlikely for this aquatic species, it is our determination that the alternatives “**may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area**” based on the proximity to known occupied sites and potentially suitable assume occupied habitat.

Alternative Comparison Summary

For the majority of federally listed and sensitive aquatic animal species analyzed in this report, alternatives 3 and 5 propose the least amount of designated OSV areas in potentially suitable habitats. Conversely, alternatives 1 and 4 propose the most amount of designated OSV areas in potentially suitable habitats. While none of the alternatives are expected to cause any measurable changes to aquatic or upland habitats, the risk of isolated negative effects to aquatic or upland habitats at local scales varies among the alternatives. Alternative 1 (no action) would generally have the greatest potential for causing isolated negative effects to aquatic resources at local scales based as it would not implement the recommended project design criteria and mitigation measures prescribed under each of these action alternatives. Alternative 5 would generally have the least potential for causing isolated negative effects to aquatic resources at local scales based on having the deepest minimum snow depth requirement (24 inches) for cross-country OSV use and affecting the least amount of suitable habitat among the species analyzed, particularly western pond turtle. Table 68 shows the alternatives’ relative risk of isolated negative effects to aquatic species of management concern.

Table 68. Summary comparison of potential environmental effects to threatened, endangered, proposed, and sensitive (TEPS) aquatic animal species or their habitat by alternative

Resource Element	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
TEPS Aquatic Animal Species	Greatest potential for effects.	Greater potential than 3 and 5 and less than 1 and 4.	Greater potential than 5 and less than 1, 2 - modified, and 4.	Greater potential than 2 - modified, 4, and 5 and less than 1.	Least potential for effects.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

In this section, we evaluated the effects of the proposed OSV designation alternatives on federally listed or Forest Service sensitive aquatic animal species. In our opinion, all alternatives would be compliant with Forest Service Manual direction. In addition, all alternatives would comply with the Forest Plan as amended because sensitive aquatic animal species populations would remain viable and their habitats would be maintained after implementation of any of the alternatives.

Botany

This section contain the biological assessment to determine if the Plumas OSV Use Designation project may affect any U.S. Fish and Wildlife Service (USFWS) threatened, endangered, or proposed plant species and the biological evaluation of potential effects to designated Region 5 Sensitive species and watchlist species. The effects of the proposed Plumas OSV Use Designation project on these species are

evaluated and a determination is made as to whether the proposed actions may result in adverse effects. Special interest areas (SIAs) that are designated with a botanical emphasis were evaluated for consistency with maintaining the vegetation and habitat characteristics for which the SIAs were created. A Noxious Weed Risk Assessment (Volume II, appendix F) presents the weed species that exist in the project area and contains an analysis of effects from weeds and a determination of each alternative's risk of introducing and/or spreading weed species in the project area.

Methodology

This analysis uses ArcMap and relevant GIS data layers from the Plumas National Forest. The GIS layers of proposed OSV designations and trails were overlain with the botanical resource layers to identify areas of potential effects.

Federal threatened, endangered, or proposed plants and their critical habitats and Plumas National Forest sensitive plants that may be present or are known within the planning area are shown in table 70.

Watchlist plants (special interest plants) that are known to occur within the planning area are presented in table 71. The potential effects to each watchlist species were evaluated based on growth form, timing of important life cycle elements (i.e., emergence, flowering, seed production, germination, etc.), identified threats, important habitat components, and the expected interaction with disturbances associated with OSV use and snow trail grooming.

Information Sources

Information used in this analysis includes pertinent scientific literature, and GIS layers of the following data: project boundary, actions by alternative, TES and watchlist plant occurrences and critical habitat information from the U.S. Fish and Wildlife Service.

Incomplete and Unavailable Information

There is limited research and information available regarding the responses of each plant species or whole plant communities from OSV uses, including indirect effects from snow compaction and vehicle emissions during the winter.

Assumptions specific to the botanical resources analysis.

Plants are unlikely to be directly affected by authorized OSV use (with the specified requirements of specific snow depths or adequate snow depth to avoid damage to resources – typically 12 inches) when their living tissues are not present above ground. Therefore, only shrub or tree species may be directly affected.

- In this analysis, areas of high use are assumed to be the same as those used for the wildlife analysis.
- Indirect effects, such as those possibly resulting from snow compaction and vehicle emissions, are likely to be concentrated in the high use areas.
- Over-snow vehicles, towing vehicles, or trailers may carry mud or other debris containing weed seeds from infested areas to trailheads and possibly indirectly into any areas designated for OSV use.
- Only authorized OSV uses are analyzed. Concerns arising from unauthorized uses are addressed as law enforcement issues and may prompt corrective actions.

- Resource monitoring may identify unexpected types or levels of impacts to botanical resources, and may also prompt corrective actions as warranted, including possible area closures.

Spatial and Temporal Context for Effects Analysis

The botany analysis area includes all of the National Forest System lands within the Plumas National Forest.

Direct and Indirect Effects Boundaries

The spatial boundary for analyzing the direct and indirect effects to these botanical resources is the project area boundary, because all expected effects relevant to these resources would occur and remain within this area. Effects to vegetation would be expected to have occurred or become evident within one or two years of disturbance and this constitutes the short term. Effects that linger beyond 2 years are considered long-term effects, and may extend to decades or centuries. Such long-term effects beyond 20 years become increasingly difficult to predict due to unknown interactions and the many environmental variables with numerous possible outcomes.

Cumulative Effects Boundaries

Because effects from the proposed activities would interact with effects from other ongoing or future projects only within the project area boundary, the cumulative effects boundary is also the project area boundary. Cumulative effects are considered for a time period within 20 years of project implementation.

Issues

Significant Issue 3b is the effects of the proposed actions to botanical resources. The proposed OSV use designations and trail grooming have the potential to cause direct and indirect effects to federally listed threatened and endangered species, watchlist plants, and invasive species, but are most likely to affect those which have living tissues present within the snow column each season (such as trees or shrubs). Potential effects may be either direct by damage or death to individual plants from OSV (stem breaking, crushing, etc.), or indirect by increasing the opportunity for pathogens to attack damaged plant tissues or by altering habitat. Possible effects include but are not limited to: physical damage to plants and habitats; reduced seed production; decreased plant vigor; changes in hydrology; changes to soils, especially erosion and sedimentation; and increased risk of weed introduction and spread. These potential effects become much more likely if OSV use occurs where/when there is inadequate snow depth. Some plant species emerge from the ground very early in the growing season and subsequent snowfall may accumulate enough afterwards to allow authorized OSV use. In these cases, additional plants may also be impacted by OSV use. Compaction of snow and/or OSV emissions may lead to changes in plant composition and habitat suitability. Weed seeds may be transported into areas designated for OSV use. The proposed minimum snow depth requirements are assumed sufficient to protect the majority of plant species from damage, and these issues are examined in detail in this analysis.

Resource Indicators and Measures

Table 69. Botanical resources indicators and measures for assessing effects

Resource Element	Resource Indicator	Measure	Used to address: P/N ¹ , or key issue?	Source (LRMP S/G ² ; law or policy, BMPs, etc.)?
Vegetation	Threatened, endangered, and sensitive (TES) plant species presence	Acres of TES plant occurrences within designated OSV-use areas. Acres of TES plant occurrences within high use areas.	Yes	Forest Service Manual 2670
Vegetation	Qualitative discussion of TES plant species' responses to proposed activities	Determination category.	Yes	Forest Service Manual 2670
Vegetation	Species presence	Acres of watchlist plant occurrences within designated OSV-use areas. Acres of watchlist plant occurrences within high use areas.	Yes	National Forest Management Act Forest Service Manual 2670
Vegetation	Qualitative discussion of species' responses to proposed activities	Watchlist plants effects statement.	Yes	National Forest Management Act Forest Service Manual 2670
Vegetation	Noxious/invasive weed presence	Acres of weed infestations within designated OSV-use areas. Acres of weed infestations within high use areas.	No	Forest Service Manual 2900
Vegetation	Noxious/invasive weed response to proposed activities	Level of risk (high, moderate, low) for the project introducing or spreading weeds.	No	Forest Service Manual 2900
Vegetation	Presence of designated botanical resource areas	Acres of botanical resource areas within designated OSV-use areas. Acres of botanical resource areas within high use areas.	No	Plumas National Forest Land and Resource Management Plan

¹ P/N = Purpose and need, ² Land and Resource Management Plan Standards and Guidelines

Affected Environment

The Plumas National Forest occupies a portion of the northern Sierra Nevada Mountains, from the foothills to the Sierra crest. Many plant communities are present, including chaparral, oak and pine woodlands, montane forests and subalpine areas, along with numerous wetlands and other special habitats. These plant communities have been subject to a variety of actions and natural events that have shaped the current condition. Timber harvest, livestock grazing, mining, fire suppression, recreational activities, and other actions have influenced vegetation, including both common and rare species. Natural events, such as fire, flood, high winds, snow and ice, and even the lack of fire have also influenced plant communities.

Existing Condition

Threatened, Endangered, and Sensitive Plants

The threatened, endangered, and sensitive (TES) plant species considered in this analysis are presented in table 70.

Watchlist Plants

Sometimes referred to as “Special Interest” species, watchlist plants are species that do not meet all of the criteria to be included on the Regional Forester’s Sensitive Plant List, but are of sufficient concern that we need to consider them in the planning process. To better identify these species, forests have been encouraged to develop watchlists. Effects to these species are evaluated when they are known to occur in project areas. Fifty-nine watchlist plants are well documented in the Plumas National Forest, and are listed in table 71.

Special Interest Areas

The 12 special interest areas (SIAs) are currently designated in the Plumas National Forest, are analyzed for impacts from the project. Research Natural Areas (RNA) are discussed elsewhere in the document, although Mud Lake RNA will be discussed in relation to Modoc cypress.

Brady’s Camp (1,422 acres)

Butterfly Valley (1,840 acres, for unique plants of a boggy site)

Dixie Mountain (4,361 acres, for Bailey’s *ivesia*)

Eastern escarpment (2,168 acres)

Fales Basin (103 acres, protects a unique occurrence of California pitcher plant)

Fowler Lake (477 acres, protects 2 sensitive aquatic plants)

MacNab Cypress (100 acres, protecting MacNab cypress trees)

McRae Meadow (6,869 acres)

Mount Fillmore (3,440 acres, protects 2 rare plant species)

Mountain House (161 acres)

Red Hill (9,530 acres, protects several rare plant species)

Valley Creek (304 acres, protecting Sierra Nevada mixed conifer old-growth forest)

Table 70. Threatened, endangered, and sensitive plant species considered

Scientific Name Common Name	Habitat	Species present?	Habitat present?	Effects analysis needed?
Threatened Plants				
<i>Ivesia webberi</i> Webber's Ivesia	Found in vernal moist, rocky, clay soils in barren patches of sagebrush scrub, open summits and ridge tops, and in meadow areas on drier, raised hummocks from 3,200 to 6,800 feet. Perennial herb. Species occurs to the southeast of the Plumas National Forest.	No	Not likely	No
<i>Orcuttia tenuis</i> <i>slender orcutt grass</i>	Vernal pools, in oak and/or pine woodlands. Below 5,800 feet. Flowers May-July. Annual grass. Species occurs in Lassen National Forest.	No	No	No
<i>Packera layneae</i> Layne's Butterweed	Grows on rocky, gabbro or serpentine soils, in chaparral and cismontane woodland below 3,000 feet.	No	No	No
Sensitive Plants				
<i>Allium jepsonii</i> Jepson's Onion	Serpentine soils in foothill woodland or mixed coniferous forest and steep rock outcrops from 1,400 to 3,800 feet. Perennial herb.	Yes	Yes	Yes
<i>Astragalus lemmonii</i> Lemmon's Milk-Vetch	Alkali meadows, seeps, marshes, and lakeshores in Great Basin scrub between 3,300 and 7,200 feet. Perennial herb.	No	Possible	Yes
<i>Astragalus lentiformis</i> Lens-Pod Milk-Vetch	Bare, xeric volcanic soils in flat to gently sloping sagebrush/pine woodlands between 4,900 and 6,400 feet. Perennial herb.	Yes	Yes	Yes
<i>Astragalus pulsiferae</i> var. <i>coronensis</i> Modoc Plateau Milk-Vetch	Sandy silt that is friable at the surface and hard-packed beneath and among basalt cobble and gravel with juniper, sagebrush, bitterbrush, and Jeffrey pine from 5,600 to 6,300 feet. Perennial herb.	Yes	Yes	Yes
<i>Astragalus pulsiferae</i> var. <i>pulsiferae</i> Pulsifer's Milk-Vetch	Steep, sandy or gravelly slopes in Great Basin scrub, pinyon, and juniper woodlands and lower montane coniferous forests between 4,200 and 6,000 feet in elevation. Perennial herb.	Yes	Yes	Yes
<i>Astragalus webberi</i> Webber's Milk-Vetch	Open, rocky areas to moderately dense stands of hardwoods and conifers from 2,400 to 4,100 feet. Perennial herb.	Yes	Yes	Yes
<i>Balsamorhiza macrolepis</i> Big-Scale Balsamroot	Ponderosa pine forest, chaparral, vernal moist meadows and grasslands within oak woodland below 4,600 feet. Perennial herb.	No	Possible	Yes
<i>Boechea constancei</i> Constance's Rockcress	Serpentine, rocky soils, of chaparral, and montane coniferous forests from 4,000 to 6,300 feet. Perennial herb.	Yes	Yes	Yes

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Scientific Name Common Name	Habitat	Species present?	Habitat present?	Effects analysis needed?
<i>Botrychium ascendens</i> Upswept Moonwort	Found in lower montane coniferous forest, meadows, and seeps from 4,900 to over 7,500 feet in elevation. Perennial herb.	No	Possible	Yes
<i>Botrychium crenulatum</i> Scalloped Moonwort	Fens, lower montane coniferous forest, meadows, seeps, and freshwater marshes from 4,900 feet to 10,500 feet in elevation. Perennial herb.	Yes	Yes	Yes
<i>Botrychium lunaria</i> Common Moonwort	Meadows, seeps, subalpine and upper montane coniferous forest from 7,450 feet to over 11,000 feet in elevation. Perennial herb.	No	Possible	Yes
<i>Botrychium minganense</i> Mingan Moonwort	Occurs in lower and upper montane coniferous forest, meadows, and seeps from 4,900 feet to 6,750 feet in elevation. Perennial herb.	Yes	Yes	Yes
<i>Botrychium montanum</i> Western Goblin	Occurs in lower and upper montane coniferous forest, meadows, and seeps from 4,900 feet to 7,000 feet in elevation. Perennial herb.	Yes	Yes	Yes
<i>Botrychium pinnatum</i> Northwestern Moonwort	Found most often in moist grassy sites of open forests and meadows, along streams, and can be found under closed canopies from 6,200 to 9,200 feet. Perennial herb.	No	Possible	Yes
<i>Bruchia bolanderi</i> Bolander's Bruchia	Grows along stream banks, meadows, fens, and springs in mixed conifer forest and subalpine plant communities from 5,200 to 7,000 feet. Bryophyte, Moss (Perennial).	Yes	Yes	Yes
<i>Buxbaumia viridis</i> Buxbaumia Moss	Found on wood in a late stage of decay or peaty soils in moist conifer forest from 3,400 feet. Bryophyte, Moss (Perennial).	Yes	Yes	Yes
<i>Calycadenia oppositifolia</i> Butte County Calycadenia	Found in grassy openings of woodlands, chaparral, and forested habitats below 3,100 feet in elevation. Annual herb.	Yes	Yes	Yes
<i>Clarkia gracilis</i> ssp. <i>albicaulis</i> White-Stemmed Clarkia	Openings of chaparral, woodlands, and lower coniferous forest from 1,100 to 1,400 feet. Annual herb.	Yes	Yes	Yes
<i>Clarkia mildrediae</i> ssp. <i>mildrediae</i> Mildred's Clarkia	Cismontane woodland and in lower montane coniferous forest, usually on sandy granitic substrate from 1,500 to 5,400 feet. Annual herb.	Yes	Yes	Yes
<i>Clarkia mosquinii</i> Mosquin's Clarkia	Occurs in the foothill woodland and lower elevation mixed conifer forest from 1,200 to 4,400 feet. Annual herb.	Yes	Yes	Yes
<i>Cypripedium fasciculatum</i> Clustered Lady's-Slipper	Mixed conifer forests in mid-to-late successional stages from 2,400 to 6,000 feet. Perennial herb.	Yes	Yes	Yes
<i>Cypripedium montanum</i> Mountain Lady's-Slipper	Moist areas and upland sites with northerly aspects, loamy soils and shade, from 3,500 to 5,700 feet (generally <5,000 feet). Perennial herb.	Yes	Yes	Yes

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<i>Dendrocollybia racemose</i> Branched Collybia	Mycoparasitic fungus found fruiting on decayed mushroom remains after rapidly digesting host or in duff layer of mixed hardwood-conifer forests. Occurs below 4,500 feet. Saprophytic basidiomycete. Fungi.	No	Possible	Yes
<i>Eleocharis torticulmis</i> California Twisted Spikerush	Open wet meadows and fens of mixed conifer forest from 3,300 to 3,900 feet. Perennial graminoid.	Yes	Yes	Yes
<i>Eremogone cliftonii</i> Clifton's Eremogone	Forests and chaparral habitat on weathered granite soils from 1,700 to 5,400 feet. Perennial herb.	Yes	Yes	Yes
<i>Eriogonum microthecum</i> var. <i>schoolcraftii</i> Schoolcraft's Wild Buckwheat	Sandy to rocky soil, sagebrush communities, pinyon-juniper woodlands from 4,600 to 7,200 feet. Perennial Shrub.	No	Possible	Yes
<i>Eriogonum umbellatum</i> var. <i>ahartii</i> Ahart's Buckwheat	Serpentine slopes in open chaparral and mixed conifer forests from 2,500 to 6,100 feet. Perennial herb.	Yes	Yes	Yes
<i>Fissidens aphelotaxifolius</i> Brook Pocket Moss	Wet soil; humus and rocks along narrow streams and in the vicinity of small waterfalls; and in damp or wet crevices of cliffs from 6,500 to 7,200 feet. Bryophyte, Moss (Perennial).	No	Possible	Yes
<i>Fissidens pauperculus</i> Minute Pocket Moss	Perennially moist soil along the North Coast and in the Sierra Nevada, often in association with other species of <i>Fissidens</i> from 2,700 to 3,500 feet. Bryophyte, Moss (Perennial).	Yes	Yes	Yes
<i>Frangula purshiana</i> ssp. <i>ultramafica</i> Caribou Coffeeberry	Open, mixed forests, chaparral, and serpentine seeps and rock streambeds from 2,700 to 6,300 feet. Perennial shrub.	Yes	Yes	Yes
<i>Fritillaria eastwoodiae</i> Butte County Fritillary	Dry slopes in open stands of mixed conifer forest or semi-shaded chaparral in foothill woodlands from 1,300 to 3,700 feet. Perennial herb.	Yes	Yes	Yes
<i>Helodium blandowii</i> Blandow's Bog Moss	Wet meadows, fens, and seeps in subalpine coniferous forest and in alpine lakes from 6,100 to 8,856. Bryophyte, Moss (Perennial).	No	Possible	Yes
<i>Ivesia aperta</i> var. <i>aperta</i> Sierra Valley Ivesia	Sagebrush plant communities at the eastern base of the Sierra Nevada in association with meadow flats, meadow borders, rocky ephemeral stream channels, gentle rocky slopes with sparse vegetative cover, and vernal pools from 4,900 to 6,500 feet. Perennial herb.	Yes	Yes	Yes
<i>Ivesia sericoleuca</i> Plumas Ivesia	Vernally wet parts of meadows and alkali flats, and in vernal pools from 4,900 to 5,900 feet. Perennial herb.	Yes	Yes	Yes

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Scientific Name Common Name	Habitat	Species present?	Habitat present?	Effects analysis needed?
<i>Juncus luciensis</i> Santa Lucia Dwarf Rush	Wet sandy soil of seepage areas on sandstone, depressions in meadows, vernal pools, and stream sides from 900 to 6,700 feet. Annual graminoid.	Yes	Yes	Yes
<i>Lewisia cantelovii</i> Cantelow's Lewisia	Broadleaved upland forest, chaparral, cismontane woodland, and lower montane coniferous forest typically associated with mosses or club moss growing on wet metamorphic and granitic rock formations within river canyons from 1,400 to 4,400 feet. Perennial herb.	Yes	Yes	Yes
<i>Lewisia kelloggii</i> ssp. <i>hutchisonii</i> Hutchison's Lewisia	Openings in upper montane coniferous forest, often on slate soils and on soils that are sandy granitic to erosive volcanic from 4,800 to 7,000 feet. Flowers July-August. Perennial herb.	Yes	Yes	Yes
<i>Lewisia kelloggii</i> ssp. <i>kelloggii</i> Kellogg's Lewisia	Granitic gravel on ridge tops and flats, sparsely vegetated by Jeffrey pine and lodgepole pine woodlands, with patches of upland sedge and rock garden wildflowers from 5,100 to 7,000 feet. Perennial herb.	Yes	Yes	Yes
<i>Lomatium roseanum</i> Adobe Parsley	Occurs in pockets of clay on open rocky ridges and slopes and open gravelly volcanic scabland from 5,900 to 7,300 feet. Perennial herb.	Yes	Yes	Yes
<i>Meesia uliginosa</i> Broad-Nerved Hump-Moss	Grows in permanently wet, primarily spring-fed meadows and fens in montane to subalpine coniferous forest from 4,200 to 9,200 feet. Bryophyte, Moss (perennial).	Yes	Yes	Yes
<i>Mielichhoferia elongate</i> Elongate Copper Moss	Foothill woodlands dominated by oaks or chaparral on metamorphic, sedimentary, limestone, granite and serpentine rock outcrops that are seasonally wet (seep-like). It occurs between 1,640 to 4,264 feet in elevation and is often found in protected crevices in rock walls. Bryophyte, Moss (Perennial).	No	Possible	Yes
<i>Monardella follettii</i> Follett's Monardella	Within a band of serpentine that extends from Meadow Valley to Red Hill. Plants are often found in open, rocky areas and openings in mixed conifer forest from 3,000 to 6,300 feet. Perennial herb.	Yes	Yes	Yes
<i>Monardella stebbinsii</i> Stebbins' Monardella	Barren, sandy to gravelly ledges on steep outcrops or scree slopes of serpentine from 2,600 to 4,800 feet. Perennial herb.	Yes	Yes	Yes
<i>Oreostemma elatum</i> Tall Alpine-Aster	Wet meadows, fens, and seeps within upper montane coniferous forest from 2,900 to 6,200 feet. Perennial herb.	Yes	Yes	Yes
<i>Packera eurycephala</i> var. <i>lewisrosei</i> Lewis Rose's Ragwort	Ultramafic influenced soils and rocky areas in mixed-conifer forests from 1,200 to 5,700 feet. Perennial herb.	Yes	Yes	Yes

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Scientific Name Common Name	Habitat	Species present?	Habitat present?	Effects analysis needed?
<i>Peltigera gowardii</i> Veined Water Lichen	Submerged in clear shallow streams fed by cold water springs where it always or in the water spray zone typically on rocks but may also be on soil or wood from 2,700 to 8,100 feet. Lichen.	Yes	Yes	Yes
<i>Penstemon personatus</i> Closed-Throated Beardtongue	Mixed conifer and/or red fir plant communities in semi-shade or open places such as dry hillsides, forest openings, and edges from 4,500 to 7,100 feet. Perennial herb.	Yes	Yes	Yes
<i>Penstemon sudans</i> Susanville Beardtongue	Pinyon pine and juniper woodlands and openings in yellow pine and mixed conifer forests, usually on rocky volcanic soils from 6,600 to 7,300 feet. Perennial herb.	Yes	Yes	Yes
<i>Phaeocollybia olivacea</i> Olive Phaeocollybia	Scattered or in arcs in mixed forests containing Fagaceae or Pinaceae in coastal lowlands. Ectomycorrhizal basidiomycete.	No	Possible	Yes
<i>Poa sierrae</i> Sierra Blue Grass	Shady moist slopes, often on mossy rocks, in canyons and forests from 1,500 to 5,100 feet. Perennial graminoid.	Yes	Yes	Yes
<i>Pyrrocoma lucida</i> Sticky Pyrrocoma	Vernally saturated soils of alkaline clay meadows within sagebrush scrub habitats below 6,000 feet. Perennial herb.	Yes	Yes	Yes
<i>Sedum albomarginatum</i> Feather River Stonecrop	Serpentine rock cliffs, outcrops, and slopes in mixed-conifer forests from 1,700 to 6,400 feet. Perennial herb.	Yes	Yes	Yes

Table 71. Watchlist plants considered

Scientific Name Common Name	Habitat	Life Form
<i>Agrostis hendersonii</i> Henderson's bentgrass	Vernal pools (lower elevations). Flowers April-June.	Annual herb
<i>Allium sanbornii</i> var. <i>sanbornii</i> Sanborn's onion	Granite, volcanic, or serpentine outcrops. Flowers May-Sept.	Perennial herb
<i>Anomobryum julaceum</i> slender silver moss	Moss growing on acidic seepy or damp soil, rock ledges, cliff crevices, and in late snow melt sites. It is known from Yosemite NP.	Bryophyte, moss (Perennial herb-like)
<i>Artemisia tripartita</i> ssp. <i>tripartite</i> threetip sagebrush	Upper montane coniferous forest, in rock, volcanic openings. 7,200 to 8,500 feet. Flowers in August.	Shrub
<i>Astragalus whitneyi</i> var. <i>lenophyllus</i> woolly-leaved milk vetch	Rocky alpine and subalpine sites. Flowers July-Aug.	Perennial herb
<i>Botrychium simplex</i> least moonwort	Near hard water seeps and streams.	Perennial herb
<i>Bulbostylis capillaris</i> thread-leaved beakseed	Meadows, Open damp/dry sandy-gravelly soil. Flowers June-Aug.	Annual herb
<i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i> Butte County morning glory	Open dry slopes in pine or oak and pine forests. 2000-4000 ft. Flowers May-July.	Perennial herb
<i>Cardamine pachystigma</i> var. <i>dissectifolia</i> dissected-leaved toothwort	Rocky sites, usually serpentine. Flowers Feb-May.	Perennial herb
<i>Carex cyrtostachya</i> arched sedge	Wet meadows, marshes, seasonally wet outcrops, seeps, swales, riparian margins, floodplain terraces. Flowers May-Aug.	Perennial herb
<i>Carex davyi</i> Davy's sedge	Dry to wet meadows, grasslands, and open forests between 1,600 and 10,800 feet. Flowers May-Aug.	Perennial herb
<i>Carex lasiocarpa</i> slender sedge	Pond edges and fens. Flowers June-July.	Perennial herb
<i>Carex limosa</i> shore sedge	Fens. Flowers June-Aug.	Perennial herb
<i>Carex scabriscula</i> Siskiyou sedge	Mesic, sometimes serpentine seeps. Flowers May-July.	Perennial herb
<i>Carex scoparia</i> pointed broom sedge	Wet, open places, lake shores. Flowers in May.	Perennial herb
<i>Carex sheldonii</i> Sheldon's sedge	Meadows, aspen stands, moist open areas in patchy riparian scrub, seasonally moist areas in coniferous forest, and adjacent to creeks and riparian areas.	Perennial herb

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Scientific Name Common Name	Habitat	Life Form
<i>Carex xerophila</i> chaparral sedge	Serpentine, gabbroic substrates. Flowers Mar-June.	Perennial herb
<i>Caulanthus major</i> var. <i>nevadensis</i> Nevada jewelflower	Juniper woodland, open rocky areas. Flowers June-July.	Perennial herb
<i>Chenopodium simplex</i> large-seeded goosefoot	Openings and disturbed areas of the lower montane coniferous forest, between 4,600 and 7,900 feet.	Annual herb
<i>Clarkia biloba</i> ssp. <i>brandegeeae</i> Brandegee's clarkia	Forested edges/openings, below 3,100 feet. Flowers May-July.	Annual herb
<i>Clarkia mildrediae</i> ssp. <i>lutescens</i> golden-anthered clarkia	Woodland/forested edges, below 5,750 feet. Flowers June-August.	Annual herb
<i>Claytonia palustris</i> marsh claytonia	Montane marshes and swamps. Flowers June-Aug.	Perennial herb
<i>Cypripedium californicum</i> California lady's slipper	Seeps and streambanks, usually serpentine. Flowers Apr-Aug.	Perennial herb
<i>Darlingtonia californica</i> California pitcher plant	Wetlands/riparian, 0 to 8,500 feet. Flowers April-July.	Perennial herb
<i>Didymodon norrisii</i> Norris' beard-moss	Seasonally moist and exposed or partially shaded rock outcrops, in areas of transition forest of chaparral, black oak, canyon live oak, Douglas fir, pine and incense cedar. 1,940 to 6,370 feet.	Bryophyte, moss (Perennial herb-like)
<i>Drosera rotundifolia</i> round-leaved sundew	Bogs, fens, wetland/riparian, below 8,500 feet. Flowers June-September.	Perennial herb
<i>Dryopteris filix-mas</i> male fern	Granitic cliffs and boulders in pine forests, below 10,000 feet.	Perennial herb
<i>Epilobium luteum</i> yellow willow-herb	Wetland areas, 4,900 to 5,600 feet. Flowers July-September.	Perennial herb
<i>Erigeron lassenianus</i> var. <i>deficiens</i> Plumas rayless daisy	Meadows and openings in mixed conifer forests between 3,900 and 4,600 feet.	Perennial herb
<i>Erigeron petrophilus</i> var. <i>sierrensis</i> northern Sierra daisy	Rocky foothills to forests, sometimes on serpentine. Flowers June-Sept.	Perennial herb
<i>Erigeron reductus</i> var. <i>reductus</i> California rayless daisy	Crevice, and other open, rocky sites. Flowers June-Aug.	Perennial herb
<i>Erythranthe filicifolia</i> fern-leaved monkeyflower	Usually slow-draining, ephemeral seeps among exfoliating granitic slabs. Flowers Apr-June.	Annual herb

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Scientific Name Common Name	Habitat	Life Form
<i>Hemieva ranunculifolia</i> Buttercup-leaf suksdorfia	Riparian/wetland/mesic, rocky, granitic areas, 4,900 to 8,200 feet. Flowers June-August.	Perennial herb
<i>Hesperocyparis bakeri</i> Baker's cypress	In the Plumas National Forest, this tree grows in high elevation, cool montane environments,	Tree
<i>Hesperocyparis macnabiana</i> MacNab's cypress	Dry ridges with gravelly or thin soils.	Tree
<i>Ivesia baileyi</i> var. <i>baileyi</i> Bailey's ivesia	Great Basin scrub, lower montane coniferous forest. Flowers May- Aug.	Perennial herb
<i>Juncus dudleyi</i> Dudley's slender rush	Wet areas in montane conifer forest. Flowers July-Aug.	Perennial herb
<i>Lilium humboldtii</i> ssp. <i>humboldtii</i> Humboldt lily	Openings in chaparral, cismontane woodland, or lower montane conifer forests. Flowers May-August.	Perennial herb
<i>Lomatium foeniculeum</i> ssp. <i>macdougalii</i> MacDougal's lomatium	Sagebrush scrub, pine woodland. Flowers June-July.	Perennial herb
<i>Lycopus uniflorus</i> northern bugleweed	Fens, marshes, swamps. July-Sept.	Perennial herb
<i>Meesia triquetra</i> three-ranked hump moss	Fens, meadows, and seeps in upper montane coniferous forest or subalpine areas, 4,200 to 9,700 feet.	Bryophyte, moss (Perennial herb-like)
<i>Mimulus glaucescens</i> shield-bracted monkeyflower	Wet places in foothill woodland, grassland. Flowers Mar-May.	Annual herb
<i>Mimulus pygmaeus</i> Egg Lake monkeyflower	Moist soil in open meadows, drainages or edges of pools, in open woods, sage. Flowers May-June.	Annual herb
<i>Penstemon janishiae</i> Janish's beardtongue	Volcanic soils in sagebrush scrub, pinyon-juniper woodland openings, or partial shade of coniferous forests, between 3,500 to 7,700 feet.	Perennial herb
<i>Perideridia bacigalupi</i> Bacigalupi's yampah	Serpentine soils, in chaparral and pine woodlands, 1,400-3,400 feet. Flowers June-August.	Perennial herb
<i>Pinus washoensis</i> Washoe pine	Upper slopes of granitic or volcanic substrates.	Tree
<i>Polystichum lonchitis</i> holly fern	Subalpine and upper montane conifer forests/ granitic or carbonate. 5400-7800 ft. Flowers June-Sept.	Perennial herb
<i>Potamogeton praelongus</i> white-stemmed pondweed	In deep water of lakes and marshes. Flowers July-Aug.	Aquatic perennial
<i>Rhamnus alnifolia</i> alder buckthorn	Riparian habitats of the upper to lower montane coniferous forests.	Perennial herb

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Scientific Name Common Name	Habitat	Life Form
<i>Rhynchospora alba</i> white beaked-rush	Fens, freshwater marshes in yellow pine, mixed conifer, or fir. Flowers July-Aug.	Perennial herb
<i>Rhynchospora capitellata</i> brownish beaked-rush	Marshes, meadows and seeps in conifer forests, below 6,500 feet. Flowers July-August.	Perennial herb
<i>Schoenoplectus subterminalis</i> water bulrush	Fen and montane lake margins. Flowers July-Aug.	Aquatic perennial
<i>Scutellaria galericulata</i> marsh skullcap	Meadows, seeps, marshes, fens, and other wet habitats in the lower montane coniferous forest, up to 6,900 feet. Flowers June-Sept.	Perennial herb
Sphagnum spp.	Moss mats in wet areas.	Bryophyte, moss (Perennial herb-like)
<i>Stellaria longifolia</i> long-leaved starwort	Fens, wet meadows and riparian zones. Flowers May-Aug.	Perennial herb
<i>Trichodon cylindricus</i> moss	Sandy, exposed soils, such as upturned root wads and roadbanks at elevations up to 6,500 feet.	Bryophyte, moss (Perennial herb-like)
<i>Trifolium lemmonii</i> Lemmon's clover	Sagebrush scrub and yellow pine forest. Flowers May-July.	Perennial herb
<i>Veronica cusickii</i> Cusick's speedwell	Moist soils, alpine boulder and rock fields, meadows, and seeps, above 6,500 feet. Flowers July-August.	Perennial herb
<i>Viola tomentosa</i> woolly violet	Gravelly openings in montane coniferous forest.	Perennial herb

Environmental Consequences

Effects common to all alternatives

Because the alternatives are very similar, with the same activities proposed, and the differences are mainly the spatial extent of OSV use, most of the effects are described in this section. The varying areas of authorized OSV use would result in mostly small differences in degree of potential effects. Therefore, each alternative's effects mainly summarizes the extent of botanical resources affected, and provides the basis for determinations. A summary comparison of alternatives follows, providing the decision-maker a quick reference for evaluating the alternatives along with the other resources that need to be considered. Detailed results of botanical resource indicators and measures for each alternative, by species, are presented in the specialist reports.

Threatened and Endangered Plants

***Packera layneae* (Layne's butterweed)**

Layne's butterweed was thought to occur on the Plumas National Forest, but those occurrences have been determined to be the species *Packera eurycephala* var. *eurycephala* (widehead groundsel). There is little possibility of the species occurring on the Plumas National Forest due to the distance of the forest to the distribution of the known occurrences. The Biological Assessment determined there would be no effect from the project activities for *Ivesia webberi* (Webber's ivesia), *Orcuttia tenuis* (slender orcutt grass) and *Packera layneae* (Layne's butterweed) due to a lack of species occupancy or lack of designated critical habitat within the Plumas National Forest, and/or a lack of effects from project activities. Federally listed plant species will not be discussed further in this document.

Sensitive and Watchlist Plants

Effects analyses for watchlist plants are evaluated in categories of plant life forms because the greatest possible impacts from OSV activities are dependent upon the presence of their living tissues within the snow or above the snow surface and whether each species is biologically active during the times that direct and indirect effects may occur. Effects to each life form category are presented after an introduction of direct and indirect effects.

Aggregating Species for Analysis of Effects

Because OSV effects to various plant species are expected to be most similar according to their life form and growth habits, the species considered in this analysis are grouped into the following categories:

- **Trees, shrubs, or sub-shrub species**, (woody plants) whose living tissues may be present above or within the snow column, and thus may experience direct effects from OSV uses (physical damage or immediate exposure to exhaust). In the Plumas National Forest, *Eriogonum microthecum* var. *schoolcraftii* and *Frangula purshiana* ssp. *ultramafica* are the two sensitive plants in this category, and one shrub and three tree watchlist species are in this category.
- **Perennial herbaceous species**, including grasses, fungi, mosses and liverworts, whose living tissues are at or below the soil surface, and thus are unlikely to experience direct effects, but they are evaluated for impacts by exhaust contaminants trapped by the snow cover or by possible effects from snow compaction. In the Plumas National Forest, there are 43 sensitive plants in this category. Most of the plant species analyzed are in this category.

- **Annual plant species** are generally not growing during the period of authorized OSV use, and thus, would not experience direct effects. This group is the least likely to be impacted by the indirect effects of exhaust contaminants and snow compaction. Five Sensitive and eight watchlist plant species are considered in this analysis that are annuals.
- **Aquatic plant species** grow underwater and would not be directly affected by OSV use. If an occurrence is located in high use areas, it is possible that snowpack contaminants could reach the occupied aquatic habitat when the snow melts. Snow compaction is not expected to affect aquatic habitats in any meaningful or predictable manner. In this analysis, one aquatic Sensitive and two aquatic watchlist plant species are considered.

Direct Effects

Direct effects are caused by the action and occur at the same time and place. A key difference between OSV use and other types of motor vehicle use is that, when properly operated and managed, OSVs do not make direct contact with soil, water, and ground vegetation, whereas most other types of motor vehicles operate directly on the ground (USDA Forest Service 2014). OSV use and grooming of OSV trails can damage vegetation through direct contact with plant tissues that are present above the snow or within the snow column that is compacted by the vehicles. Because woody species (trees, shrubs, and sub-shrubs) are the only plants present within the snow, they are the only plants that are likely to be directly damaged. All other plant life forms are not expected to be directly affected by OSV use because adequate snow requirements and minimum snow depths are expected to prevent direct effects to vegetation at ground level.

It is generally recognized that disturbance to soil and vegetation by OSV use is reduced as snowpack depths increase. Damage to soil and low-growing vegetation is much more likely when OSV use occurs under low snow conditions (Greller et al. 1974, Fahey and Wardle 1998). Adequate snow to avoid unlawfully damaging natural resources (assumed to be 12 inches for cross-country OSV use in this analysis) is an inherent requirement of alternative 1. Alternatives 2 - modified and 4 would implement minimum snow depths of 12 inches. Alternative 3 would allow cross-country OSV use over a minimum of 18 inches of snow, and for alternative 5, the minimum would be 24 inches. Increasing minimum snow depths would provide some measure of increased protection from damage to vegetation and other resources.

In a study on Niwot Ridge in the Front Range of the Colorado Rocky Mountains, repeated snowmobile use occurred on snow-covered and snow-free areas between two weather stations, and the effects of this use were evaluated (Greller et al. 1974). General conclusions included: (1) in communities that are snow-free in winter, damage by snowmobiles was severe to lichens, *Selaginella*, and to relatively prominent, rigid cushion-plants. Part of the damage to these communities may have been due to the manual removal of rocks, necessary for the operation of snowmobiles in snow-free areas. (2) *Kobresia*, present in isolated tussocks in a cushion-plant community, absorbed the major portion of snowmobile impact. As *Kobresia* is thought to form the climatic climax community in this ecosystem, differential damage to it could seriously retard succession. (3) Snowmobile travel in uniform, closed *Kobresia* meadows inflicted much less damage to most plants, including *Kobresia* itself, than did similar travel on a sparsely vegetated community. (4) Plants best able to survive the heaviest snowmobile impact were those with small stature and little woodiness, or with buds well-protected at or below the soil surface. (5) Snowmobile traffic should be carefully restricted to snow-covered areas. Whenever this is not feasible, the least destructive and easiest alternative is travel on mature, well-vegetated *Kobresia* meadows or similar well-drained plant communities.

On the Plumas National Forest, OSV travel on snow-free areas is not allowed in the current and proposed scenarios. By not allowing OSV use when and where there is less than adequate snow to avoid damage to resources (typically 12 inches for cross-country use) or designating specific snow depth requirements, the Plumas National Forest minimizes the possibility of direct damage to soils and ground vegetation.

Indirect Effects

Indirect effects are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable. Three specific topics of indirect effects were identified: snow compaction, pollutants, and invasive plant species. Potential effects from snow compaction and pollutants are described below, and a discussion of potential invasive plant effects is presented in Volume II, appendix F, of this FEIS.

For areas designated for cross-country OSV use, these indirect effects are expected to be more dispersed and repeated less often than along the trail corridors. There may be some meadows and other clear areas where OSV use is more attractive to riders, and these may experience more concentrated use. However, OSV use has not been identified as a threat and is unlikely to cause damage to non-woody TEPS plant occurrences in areas of dispersed use in the Plumas National Forest.

Snow Compaction

Snow is compacted by any OSVs, including snowmobiles, snow cats, and snow grooming equipment. Snow compaction mechanically alters snow grains and redistributes them. This mechanical disturbance breaks off the small points of new snow crystals, destroying the weak existing bonds between them, and bringing the new grains into much closer contact than occurs naturally. Snow metamorphism is artificially accelerated, and snow density and hardness are increased. In addition, the layered structure of the snowpack is changed (Fahey and Wardle 1998). All this has both thermal and hydrological implications, resulting in lower soil temperatures (Fahey and Wardle 1998, Eagleston and Rubin 2012) and delayed snowmelt (Keddy et al. 1979, Fahey and Wardle 1998, Davenport and Switalski 2006, Gage and Cooper 2013). The thermal conductivity of compacted snow is greater than undisturbed snow, and can reduce the buffering effect against temperature extremes and fluctuations. Thermal conductivity of compacted snow was 11.7 times greater than non-compacted snow (Neumann and Merriam 1972).

Keddy and others (1979) studied the effects of snowmobile use on snow compaction, vegetation composition, and soil temperatures on an abandoned farm in Nova Scotia. They found that snow melted later in areas with compacted snow and that some species showed differences in cover between treatments. Considering the multitude of possible effects and the variety of plant structures and life histories, they were not surprised to find no overall trend for species composition changes. They also noted that the first pass by a snowmobile caused the greatest increase in snow compaction – roughly 75 percent of that observed after 5 sequential passes. While some species composition changes were observed in old field vegetation, they found no changes in species composition in a marsh area, possibly because of solid ice cover during the winter.

In a study of the impact of snowshoe/cross-country ski compaction and snowmelt erosion on groomed trails, Eagleston and Rubin (2012) reported that these non-motorized uses caused snow to remain on the compacted areas an average of 5 days longer than non-compacted areas. They also found that the compacted snow caused increased erosion. Soil temperatures under compacted snow stayed frozen for 3 days longer, and, averaged over the entire winter season, remained 0.1 degree Celsius colder than soil under non-compacted snow.

Fahey and Wardle (1998) examined the effects of snow grooming for downhill ski areas in subalpine and alpine environments. They found that the compacted snow increased frost penetration and delayed snow melt.

However, research does not always support the generalization of lower soil temperatures and delayed snowmelt due to snow compaction. In a study of snow compaction effects from snowmobiles on fens in the Routt National Forest, Gage and Cooper (2013) found no statistically significant differences in the temperature of peat soils between compacted and non-compacted areas. They also found no differences in timing of snow melt, biomass production, or plant phenology. From additional, unpublished data from the Telluride Ski Area, where intense compaction occurred daily, they generally observed a delayed snowmelt and thawing of the soil of about one month in compacted areas. They noted that the continuous influx of groundwater in their fen habitats may limit freezing and maintain more constant soil thermal conditions.

Different plants have different levels of vulnerability and ability to recover from the effects of snow compaction. The characteristics which determine their vulnerability are the timing of flowering, and growth form and size (Fahey and Wardle 1998). Prolonged snow lie may adversely affect early spring flowering plants because they could have a shorter growing season and possibly reduced seed production due to delayed phenology and perhaps a misalignment of timing with their preferred pollinators. Due to snow compaction, early spring growth of some plant species may be retarded or may not occur under an OSV trail; however, the current and proposed OSV trails are underlain by existing roads and trails which are already compacted and/or disturbed and little, if any, additional impacts are expected to the vegetation.

Trail grooming in the Plumas National Forest occurs mostly over an existing road and trail network. The grooming does not alter landforms or result in significant soil disturbance that would change water flow patterns or quantities of surface water runoff. Trail grooming is not expected to cause adverse impacts to water quality, perennial, intermittent or ephemeral streams, wetlands or other bodies of water. No hydrological changes are expected from any OSV uses

In summary, the available research supports the assumption that more intensive snow compaction occurring along groomed or heavily used trails would have considerably greater effect on soil temperatures and delayed snowmelt than the compaction caused by dispersed uses in areas designated for cross-country OSV use. Due to the intensive, repetitive, and predictable compaction of snow along designated OSV trails (groomed or not), these areas are much more likely to have a degree of compaction that could adversely influence vegetation. **Therefore, in this analysis, botanical resources within high use areas are assumed to be at risk from the effects of snow compaction.** Outside the designated OSV trail corridors, dispersed OSV travel is much less likely to compact snow with enough intensity and repetition to measurably or predictably affect ground vegetation, and therefore is not considered in this analysis as an expected source of indirect effects. The specialist report displays which specific botanical resources are present in designated areas for each alternative.

Pollutants

Emissions from over-snow vehicles, particularly two-stroke engines on snowmobiles, release pollutants including ammonium, sulfate, benzene, nitrogen oxides, ozone, carbon dioxide, carbon monoxide, aldehydes, polycyclic aromatic hydrocarbons and other toxic compounds into the air. A portion of these compounds may become trapped and stored in the snowpack, to be released during spring runoff. Four-stroke snowmobile engines produce considerably lower amounts of pollutants.

Pollutants emitted from exhaust can cause a variety of impacts on vegetation. Carbon dioxide may function as a fertilizer and cause changes in plant species composition (Bazzaz and Garbutt 1998); nitrogen oxides also may function as fertilizers, producing similar effects along roadsides (Falkengren-Grerup 1986). Sulfur dioxide, which can be taken up by vegetation, may result in altered photosynthetic processes (Winner and Atkison 1986, Mooney et al. 1988). Other toxic compounds may result in reduced metabolism or retarded growth.

Although a large portion of OSV exhaust is expected to be dissipated into the air, some of the airborne pollutants would enter the snowpack and be released during snowmelt. Similar responses can be assumed to occur in plants that ingest these compounds from snowmelt, although the compounds may undergo chemical changes while in the snowpack, confounding the predictability of effects.

Airborne pollutants can enter the snowpack from both local and regional sources, including but not limited to vehicle emissions, dust storms, and smog. The concentrations of basic cations and acidic anions in the snowpack can be altered and, when released quickly during snow melt, can temporarily lower the pH of surface waters in a process known as “episodic acidification” (Blanchard et al. 1988). Soil acidification and vegetation changes were examined in southern Sweden, where Falkengren-Grerup (1986) found that increased nitrogen deposition and the increased acidity in the humus layer may have caused changes in plant cover, with some species increasing and some species decreasing.

Demonstrating that snowpack chemistry can be used as a quantifiable indicator of airborne pollutants from vehicular traffic, a correlation was shown between pollutant levels and vehicle traffic in Yellowstone National Park (Ingersoll et al. 1997). Ammonium and sulfate levels were consistently higher for the in-road snow compared to off-road snow, but nitrate concentrations did not decrease within a distance of 100 meters from the emission source; thus, the nitrate ion may be used to distinguish between local and regional emission sources (Ingersoll et al. 1997). Studying snow chemistry in Yellowstone National Park, Ingersoll (1998) found that concentrations of ammonium, nitrate, sulfate, benzene, and toluene were positively correlated with snowmobile use. Concentrations of ammonium were up to three times higher for the in-road snow compared to off-road snow. Concentrations decreased rapidly with distance from roadways.

Arnold and Koel (2006) also examined volatile organic compounds in Yellowstone National Park, and found that the snow in heavily used areas contained higher levels of benzene, ethylbenzene, m- and p-xylene, o-xylene, and toluene compared with a control site only 100 meters from the traveled roadways. Even at the most heavily used area (Old Faithful) they found that the concentrations of volatile organic compounds were considerably below U. S. Environmental Protection Agency’s water quality criteria for these compounds. In situ water quality measurements (temperature, dissolved oxygen, pH, specific conductance, and turbidity) were collected; all were found within acceptable limits. Five volatile organic compounds were detected (benzene, ethylbenzene, m- and p-xylene, o-xylene, and toluene). The concentrations were found below EPA criteria and guidelines for the volatile organic compounds analyzed and were below levels that would adversely impact aquatic ecosystems (Arnold and Koel 2006).

Studying air quality and snow chemistry effects from snowmobiles in the Snowy Range, Wyoming, Musselman and Korfmacher (2007) found that heavier snowmobile use resulted in higher levels of nitrogen oxides and carbon monoxide, but ozone and particulate matter were not significantly different. When compared with air quality during the summer, they found that carbon monoxide levels were higher in the winter, but nitrogen oxides and particulate matter were higher in the summer. Air pollutants were well-dispersed and diluted by winds, and air quality was not perceived as being significantly affected by snowmobile emissions. Pollutant concentrations were generally low in both winter and summer. These

results differ from those studies examining air pollution from snowmobiles in Yellowstone National Park. However, snow chemistry observations did agree with studies from Yellowstone National Park. Compared with off-trail snow, the snow sampled from snowmobile trails was more acidic with higher amounts of sodium, ammonium, calcium, magnesium, fluoride, and sulfate. Snowmobile activity apparently had no effect on nitrate levels in the snow.

In the winter, plant metabolic rates are drastically reduced. Airborne compounds would only be taken up by respiring woody plants. Airborne pollutants normally disperse quickly in mountain environments that are prone to windy conditions, such as the Sierra Nevada. Different plants may have different responses to the different pollutants in the snowpack, including damage from toxic, volatile compounds and possibly some benefits from additional nutrients and trace minerals. The levels of OSV exhaust contaminants in the Plumas National Forest (considerably less than those observed in Yellowstone National Park) are not expected to impair water quality (McNamara 2018).

In a natural plant community with many species competing for resources, and very little research done on each species' responses to OSV emissions or the competitive interactions that may be affected, it is nearly impossible to predict what changes, if any, would occur. It can only be reasonably assumed that there may be some changes in plant species cover and composition. The uptake of harmful pollutants is not expected to result in the death of any individual plants. On the Plumas National Forest, no mortality of roadside TES or watchlist plants due to vehicle pollutants has been observed, even considering year-round vehicle uses. Therefore, the level of effect to TES or watchlist plants from OSV pollutants is expected to be minimal, and would not result in loss of individuals.

The available research on OSV pollutants (both airborne and in the snowpack) indicate that some effects to vegetation may occur in the immediate vicinity of heavy use areas. Pollutants that become trapped in the snowpack are also expected to be concentrated in areas of heavy OSV use. **Therefore, in this analysis, botanical resources within high use areas are assumed to be at risk from the effects of OSV pollutants.** Outside the designated OSV trail corridors, dispersed OSV travel is much less likely to contribute harmful contaminants with high enough levels and repetition to measurably or predictably affect ground vegetation, and therefore is not considered in this analysis as an expected source of indirect effects. The specialist report displays which specific botanical resources are present in designated areas for each alternative.

Relative Potential Effects to Plant Life Forms

Considering the combination of direct and indirect effects described above, and the requirement of adequate snow to avoid resources or minimum snow depth requirements of the alternatives, the effects of proposed OSV uses can be broken down into relative categories of potential damage to the major plant life forms. From the most likely to least likely to experience measurable effects:

- Trees and taller shrubs – most likely to be directly affected, due to mechanical damage from contact with skis or tracks; indirect effects are expected if the species occurs in high use areas. Effects may occur in all areas designated for OSV use.
- Shorter shrubs and sub-shrubs (low-growing woody species) – less likely due to less exposure to direct effects (but some damage still expected); indirect effects may be expected if the species occurs in high use areas. Effects may occur in all areas designated for OSV use.
- Sub-shrubs (low-growing woody species) – less likely due to less exposure to direct effects (but still expected); indirect effects may be expected if the species occurs near designated OSV trails. Effects may occur in all areas designated for OSV use.

- Perennial herbaceous species – direct effects are not expected to occur due to the requirement of adequate snow to avoid resource damage or minimum snow depths; indirect effects may be expected if the species occurs near designated OSV trails. Effects may occur along designated OSV trails, but are not likely in areas designated for cross-country OSV use.
- Annual species – direct effects are highly unlikely due to the requirement of adequate snow to avoid resource damage or minimum snow depths; indirect effects might be expected if the species occurs near designated OSV trails and spring flowering could be altered by persistent compacted snow. Effects may occur along designated OSV trails, but are not likely in areas designated for cross-country OSV use.
- Aquatic species – direct effects would not occur because OSV use is not designated over open water; indirect effects from pollutants might be expected if the species occurs near designated OSV trails. Effects may occur along designated OSV trails, but are not likely in areas designated for cross-country OSV use.

Trees, shrubs, or sub-shrub species

Direct Effects

Snowmobile activities may damage vegetation on and along trails and in areas designated for cross-country OSV use. The most commonly observed effect from snowmobiles was the physical damage to shrubs, saplings, and other vegetation (Neumann and Merriam 1972, Wanek 1971). Winter Wildland Alliance (WWA) analyzed the Gallatin National Forest regeneration survey data collected between 1983 and 1996 in areas that were harvested and replanted. That survey data indicated snowmobiles had damaged between 12 and 720 trees per acre (WWA 2009). Damage to vegetation has been observed in the Greater Yellowstone Area that is caused by winter recreational activities that occur off trail. For example, branches of willows (*Salix* spp.) and sagebrush (*Artemisia* spp.) have been broken, and leaders have been removed from conifers (Stangl 1999). Neumann and Merriam (1972) found that rigid woody stems up to one inch in diameter were very susceptible to damage. Stems were snapped off in surface packed or crusted snow. Neumann and Merriam (1972) also observed that compacted snow conditions caused twigs and branches to bend sharply and break. Stems that were more pliable bent and sprang back although the snowmobile track often removed bark from the stems' upper surfaces. Sub-zero temperatures make stems more prone to snapping rather than bending. Direct mechanical effects by snowmobiles on vegetation at and above snow surface can be severe. After only a single pass by a snowmobile, more than 78 percent of the saplings on a trail were damaged, and nearly 27 percent of them were damaged seriously enough to cause a high probability of death (Neumann and Merriam 1972). Young conifers were found to be extremely susceptible to damage from snowmobiles. Broken stems of any woody species would provide places for pathogens to enter the plant tissues and would reduce the integrity of developing stems or trunks, both of which could lead to additional damage or death of individuals. These direct effects are expected to be localized and not result in loss of entire occurrences.

On the Plumas National Forest, OSV use may directly damage individuals of the Region 5 Sensitive species *Eriogonum microthecum* var. *schoolcraftii* and *Frangula purshiana* ssp. *ultramafica*, and the Plumas National Forest watchlist plants *Artemisia tripartata* ssp. *tripartata*, *Hesperocyparis bakeri*, *Hesperocyparis macnabiana*, and *Pinus ponderosa* var. *washoensis*.

Indirect Effects

Airborne pollutants from OSVs would be concentrated along OSV trails. Because deciduous trees and shrubs lose their leaves in the winter months, they cannot photosynthesize during fall and winter. Thus respiration is dramatically reduced for deciduous trees and shrubs. Although evergreen trees and shrubs

retain their leaves and are thus capable of photosynthesis and respiration during winter, these processes are also considerably reduced during the cold season. Reduced respiration during the winter means that smaller amounts of the airborne pollutants would be ingested through gas exchange. For low-growing woody species that are generally covered by snow when OSV use would occur (*Eriogonum microthecum* var. *schoolcraftii*), the exposure to airborne pollutants would be negligible.

Pollutants that are trapped and then released during snowmelt may (or may not) have some adverse and some beneficial effects; however, the extent and bearing of specific effects is unknown. It is expected that pollutant concentrations would be low enough that water quality would not be impaired, and thus, it is likely that plant responses, if any, would not be noticeable.

Perennial herbaceous species (including bryophytes)

Direct Effects

With the requirement of adequate snow to avoid resource damage or minimum snow depths providing protection of the soil surface and ground vegetation, perennial herbaceous species (which die back each year to buds at or below the soil surface) would not be directly affected by current or proposed OSV uses.

Indirect Effects

Snow compaction from dispersed OSV use is not expected to affect perennial herbaceous species because the possible delayed snowmelt (usually a week or two at most) and small degree of colder soil temperatures in the compacted snow areas would be within the normal range of variation. Where it occurs each year, compacted snow may alter the timing of new foliage emergence in the spring due to delayed snowmelt and colder soil temperatures, but perennial herbaceous plants in the Sierra Nevada are assumed to be adapted to a wide variety of natural snowmelt times and the effects of compacted snow would likely be masked by the annual variation in snowpack.

Pollutants from dispersed OSV use (both airborne and those small amounts that become entrapped in the snow) would also not likely affect perennial herbaceous species because living plant tissues are not present above ground during the winter and pollutants are not expected to accumulate within the snow column or in run-off at high enough concentrations to cause noticeable damage.

Where occurrences exist in high use areas, compaction and pollutants may be concentrated enough to cause some small magnitude changes to plant community interactions. No populations are expected to decline with any of the proposed OSV uses.

Annual plant species

Direct Effects

Plant species that complete their life cycle within one growing season would not be directly affected by current or proposed OSV uses because they are not growing when authorized OSV uses may occur.

Indirect Effects

Snow compaction from dispersed OSV use is not expected to affect annual species because the possible delayed snowmelt (usually a week or two at most) and small degree of colder soil temperatures in the compacted snow areas would be within the normal range of variation. Compacted snow may slightly alter the timing of seed germination and plant growth in the spring, due to delayed snowmelt and colder soil temperatures in the compacted areas. This is not expected to affect annual plants because they are assumed to be adapted to a wide variety of natural snowmelt times within their ranges of distribution. The

annual variation in snowpack and temperatures would likely mask any differences in phenology due to OSV uses.

Pollutants from dispersed OSV use (both airborne and those small amounts that become entrapped in the snow) would also not likely affect annual species because living plant tissues are not present above ground during the winter and pollutants are not expected to accumulate within the snow column or in run-off at high enough concentrations to cause any noticeable changes.

Where occurrences exist in high use areas, compaction and pollutants may be concentrated enough to cause some small magnitude changes to plant community interactions. No populations are expected to decline with any of the proposed OSV uses.

Aquatic species

Direct Effects

Aquatic plant species would not be directly affected by current or proposed OSV uses because OSVs are not authorized to operate over or within aquatic habitats.

Indirect Effects

Delayed snow melt and transfer of sub-freezing temperatures from snow compaction is not expected to affect aquatic plant species.

Airborne pollutants would not affect aquatic species because the plants grow underwater. In dispersed areas, pollutants are not expected to accumulate within the snow column or in run-off at high enough concentrations to cause any noticeable changes to vegetation. Where occurrences exist in high use areas, pollutants may be concentrated enough to cause some small magnitude changes to plant community interactions. No populations are expected to decline with any of the proposed OSV uses.

Invasive Species

See appendix F, Volume II of this FEIS – Noxious Weed Risk Assessment.

Special Interest Areas

The purpose of this SIA analysis is to determine compliance with the intended focus of Botanical Special Interest Areas. There is no variation between alternatives regarding OSV uses in SIAs, so this section applies for all alternatives. In all alternatives, OSV use is not designated within any SIA. There would be no direct or indirect effects to the botanical resources within SIAs.

Cumulative Effects

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Past activities are considered part of the existing condition and are discussed within the Affected Environment section. 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 effects. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed to those effects.

The sensitive and watchlist plant occurrences and invasive plant infestations that exist today in the Plumas National Forest are the result of these species' interactions with past environmental conditions

and natural and human disturbances. In terms of sensitive and watchlist plant habitats, past actions have resulted in an increase in densely forested stands, an increase in decadent shrubs, a decrease in key early-seral habitat components such as aspen stands, meadows, grasses and forbs, and young brush fields, and changed historic flow regimes in meadows/riparian habitats.

Snow plowing at the established OSV trailheads is an ancillary activity associated with the Plumas National Forest OSV Use Designation project, and is not analyzed as a part of the proposal. Snow plowing is not expected to affect botanical resources, other than providing an additional vector for the possible transport of noxious/invasive weed species. The risk of weed invasion by this means is relatively low in comparison with total vehicle uses throughout the year.

Other ongoing and foreseeable future activities include livestock grazing, recreation, timber harvest, fuels reduction, mining, woodcutting activities, wildfire suppression, and other activities. These activities may affect some individual sensitive and watchlist plants, but no major adverse effects are expected due to protective measures deemed necessary during environmental analysis and implemented as required. Please refer to the activities listed in the Plumas OSV Project Plant Biological Evaluation or this document.

Sensitive Plants

It is expected that all current and future projects include mitigations, such as avoidance measures or other project design features to minimize the potential for adverse impacts to Region 5 sensitive plant species.

Because at least one alternative of the current Plumas OSV use analysis identifies potential effects to 24 sensitive plants (*Astragalus lentiformis*, *Astragalus pulsiferae* var. *coronensis*, *Astragalus pulsiferae* var. *pulsiferae*, *Boechera constancei*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum*, *Bruchia bolanderi*, *Clarkia mildrediae* ssp. *mildrediae*, *Cypripedium fasciculatum*, *Cypripedium montanum*, *Eremogone cliftonii*, *Frangula purshiana* ssp. *ultramafica*, *Ivesia aperta* var. *aperta*, *Ivesia sericoleuca*, *Lewisia kelloggii* ssp. *hutchisonii*, *Lomatium roseanum*, *Meesia uliginosa*, *Monardella follettii*, *Monardella stebbinsii*, *Peltigera gowardii*, *Penstemon personatus*, *Penstemon sudans*, and *Pyrrocoma lucida*), it would only be for these species that effects from other activities could accumulate. The magnitude of effects from all of these actions together is small enough that no viability loss or downward trends are expected to result from them, even when combined with the potential effects from the proposed OSV use designations.

Watchlist Plants

Because the current Plumas OSV use analysis identifies possible minor effects for up to 30 watchlist plants (see statements of effects for each alternative, specialist report), it would only be for these species that effects from other activities could accumulate. The magnitude of effects from all of these actions together is small enough that no viability loss or downward trends are expected to result from them, even when combined with the potential effects from the proposed OSV use designations.

For these sensitive and watchlist plants that may experience overlapping effects, the extent, intensity, and type of contributing impacts must be considered. They are currently experiencing the everyday stresses of life in the wild, with drought likely impacting their growth and seed production in recent years. Besides the threat of physical damage from many of the contributing actions, these species are also threatened by invasive plant encroachments. Continuing pressures on sensitive and watchlist plant habitats include wildfire, early or late freezing, severe wind or winter storms, flooding, insect population fluxes, and other natural events. These events may also cause damage or death of sensitive and watchlist plant individuals or cause habitat changes.

As the aforementioned present and future activities take place, effects to the identified species may include damage to or death of individuals, through project actions and possible effects from introduced invasive species, increased soil erosion, and other changes to habitat characteristics. It is expected that all of these projects would include reasonable mitigations to minimize or reduce the potential for impacts and monitor for concerns to help manage impacts to sensitive and watchlist plants. Prevention measures and project design features to reduce the risk of spreading weeds are required for all the contributing actions considered. Through these project designs, the potential for these impacts to occur is small. If impacts still occur, only low intensity, localized effects are expected for the sensitive and watchlist species.

The annual, seasonal timing of OSV effects does not preclude potential for direct and indirect effects to accumulate. Broken branches of woody plants and any deceased individual plants would require one to several years to recover, and additional actions would be taking place during this recovery time. Individually and collectively, the magnitude of effects from these actions would remain relatively low. Natural disturbances, such as fire, wind and ice storms, and drought are much more likely to impact sensitive and watchlist plants, and their effects would likely be greater. With cumulative effects considered, sensitive and watchlist species viability in the OSV project area would be maintained and no downward trend or loss of viability would occur.

Invasive Plants

Invasive plants are also analyzed for each project, and design features are typically incorporated into project plans where ground disturbance may occur. In addition, weeds are routinely treated each year as part of the Plumas National Forest weeds program. The low weed risk of the Plumas National Forest OSV Use Designation project would add minimal risk to the ongoing and foreseeable actions in the planning area.

Special Interest Areas

In all alternatives, OSV use is not designated within any special interest areas. Because OSV use would not have direct or indirect effects to special interest areas, there would be no cumulative effects from OSV use.

Alternative 1 Effects to Botanical Resources

Detailed indicators and measures for botanical resources are presented in the specialist report. Table 72 summarizes these same measures by the major analysis topics.

Table 72. Botanical resources indicators and measures for alternative 1

Analysis Topic	Total acres in Plumas National Forest	Acres in high-use areas	Acres in areas designated for OSV use
Sensitive plants (14 species possibly affected)	12,568	1,499	12,470
Watchlist plants (21 species could be affected)	4,308	175	3,937
Invasive plants	3,625	36	3,421
Special interest areas	30,775	0	0

There are no additional types of effects to botanical resources beyond those described in Effects Common to All Alternatives that are specific to alternative 1. In comparison with other alternatives, alternative 1 would have the greatest potential to affect botanical resources due to largest area designated for OSV use.

Alternative 1 has no minimum snow depth requirement for OSV use, but riders still must not damage the underlying soil and vegetation resources because causing resource damage is illegal. It is assumed that a minimum of 12 inches of snow is typically needed to avoid damaging resources by ground contact. In comparison with other alternatives, these requirements provide minimum, but adequate, protections for TES and watchlist plant species.

Sensitive Plants

Sensitive plant species in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects from snow compaction and pollutants, most likely to be noticeable where they occur in high use areas. *Frangula purshiana* ssp. *ultramafica* is the one Sensitive woody plant known to exist in areas designated for OSV use, and is the species most likely to experience damaging effects from direct contact. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they too may also experience noticeable indirect effects if they occur in high use areas.

Direct damage to woody plants may occur with OSV use on any snow depth. When OSVs are operated on low snow depths, shorter woody plants (including sub-shrubs, shrubs, and young trees) are more prone to damage because their living stems are present in the snow column that could be churned by OSV tracks and paddles or disrupted by OSV skis as they are ridden across the landscape. With alternative 1, OSV use is not designated when resource damage (including damage to soil and ground vegetation) is likely to occur. During the middle portion of the OSV season, snowpack is typically several feet deep and the shorter woody plants are not directly affected. There would still be considerable potential for damage to the taller shrub, *Frangula purshiana* ssp. *ultramafica*, with deeper snowpack, with potential for unintentional breakage and abrasion of branches and leader growth. Of course, intentional damage to vegetation is considered resource damage, is punishable by law, and is prohibited. Non-woody Sensitive plants are not likely to be directly affected by OSV use with alternative 1.

Where they occur, indirect effects from snow compaction are expected to be greater with alternatives 1, 2 - modified, and 4, because only the assumed minimum protection is afforded to ground vegetation.

Sensitive Plant Determinations for Alternative 1:

For the one sensitive woody plant species that is present (*Frangula purshiana* ssp. *ultramafica*), due to the potential for indirect effects and direct damage where it occurs in areas designated for OSV use, alternative 1 of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area.**

After evaluating the specific habitat requirements of each species and potential interactions with OSV use, minor indirect effects of snow compaction and/or OSV pollutants would be possible for any of the remaining sensitive plant species present in high OSV-use areas. Therefore, alternative 1 of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area** for *Boechnera constancei*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum*, *Bruchia bolanderi*, *Clarkia mildrediae* ssp. *mildrediae*, *Cypripedium fasciculatum*, *Eremogone cliftonii*, *Lewisia kelloggii* ssp. *hutchisonii*, *Lomatium roseanum*, *Peltigera gowardii*, *Penstemon personatus*, and *Penstemon sudans*.

Because the following species are present in the Plumas National Forest, but are not known to exist in areas of high OSV use, alternative 1 of the Plumas OSV Use Designation project would have **no effect** on *Allium jepsonii*, *Astragalus lentiformis*, *Astragalus pulsiferae* var. *coronensis*, *Astragalus pulsiferae* var.

pulsiferae, *Astragalus webberi*, *Buxbaumia viridis*, *Calycadenia oppositifolia*, *Clarkia gracilis* ssp. *albicaulis*, *Clarkia mosquinii*, *Cypripedium montanum*, *Eleocharis torticulmis*, *Eriogonum umbellatum* var. *ahartii*, *Fissidens pauperculus*, *Fritillaria eastwoodiae*, *Ivesia aperta* var. *aperta*, *Ivesia sericoleuca*, *Juncus luciensis*, *Lewisia cantelovii*, *Lewisia kelloggii* ssp. *kelloggii*, *Meesia uliginosa*, *Monardella follettii*, *Monardella stebbinsii*, *Packera eurycephala* var. *lewisrosei*, *Poa sierrae*, *Pyrrocoma lucida*, and *Sedum albomarginatum*.

Because the following species are not known to exist at all in the Plumas National Forest, alternative 1 of the Plumas OSV Use Designation project would have **no effect** on *Astragalus lemmonii*, *Balsamorhiza macrolepis*, *Botrychium ascendens*, *Botrychium lunaria*, *Botrychium pinnatum*, *Fissidens aphelotaxifolius*, *Dendrocollybia racemosa*, *Helodium blandowii*, *Mielichhoferia elongata*, and *Phaeocollybia olivacea*.

Watchlist Plants

Watchlist plants in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects where they occur in high use areas. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they too may also experience indirect effects if they occur in high use areas.

Direct damage to woody plants may occur with OSV use on any snow depth. When OSVs are operated on low snow depths, shorter woody plants (including sub-shrubs, shrubs, and young trees) are more prone to damage because their living stems are present in the snow column that could be churned by OSV tracks and paddles or disrupted by OSV skis as they are ridden across the landscape. With alternative 1, OSV use is not designated when resource damage (including damage to soil and ground vegetation) is likely to occur. During the middle portion of the OSV season, snowpack is typically several feet deep and the shorter woody plants are not directly affected. There would still be considerable potential for damage to taller shrubs and tree species with deeper snowpack, with potential for unintentional breakage and abrasion of branches and leader growth. Of course, intentional damage to vegetation is considered resource damage, is punishable by law, and is not allowed. Non-woody watchlist plants are not likely to be directly affected by OSV use with alternative 1.

Where they occur, indirect effects from snow compaction are expected to be greater with alternatives 1, 2 - modified, and 4, because only the assumed minimum protection is afforded to ground vegetation.

Because there is potential for direct damage where they occur in areas designated for OSV use and indirect effects to occurrences in high use areas, four woody watchlist plants (*Artemisia tripartata* ssp. *tripartata*, *Hesperocyparis bakeri*, *Hesperocyparis macnabiana*, and *Pinus ponderosa* var. *washoensis*) **may be affected** by alternative 1 of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester's Sensitive Plant List.

Because there is potential for indirect effects to occurrences in high-use areas, 12 of the perennial herbaceous watchlist plants (*Botrychium simplex*, *Carex lasiocarpa*, *Carex scabriuscula*, *Drosera rotundifolia*, *Erigeron lassenianus* var. *deficiens*, *Erigeron petrophilus* var. *sierrensis*, *Erigeron reductus* var. *reductus*, *Meesia triquetra*, *Polystichum lonchitis*, *Sphagnum* spp., *Stellaria longifolia*, and *Viola tomentosa*), four of the annual watchlist plants (*Bulbostylis capillaris*, *Chenopodium simplex*, *Clarkia mildrediae* ssp. *lutescens*, and *Erythranthe filicifolia*), and one of the aquatic watchlist plants

(*Schoenoplectus subterminalis*), **may be affected** by alternative 1 of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester’s Sensitive Plant List.

For all other watchlist plants not specifically mentioned above, because they are not known to be present in high use areas, alternative 1 of the Plumas OSV Use Designation project **would not affect** these species.

Special Interest Areas

As with all alternatives, because OSV access not designated within them, no direct or indirect effects to vegetation are expected to occur in SIAs.

Alternative 2 - modified Effects to Botanical Resources

Detailed indicators and measures for botanical resources are presented in the specialist report. Table 73 summarizes these same measures by the major analysis topics.

Table 73. Botanical resource indicators and measures for alternative 2 - modified

Analysis Topic	Total acres on Plumas National Forest	Acres in high use areas	Acres in areas designated for OSV use
Sensitive plants (15 species possibly affected)	12,568	1,499	8,537
Watchlist plants (20 species could be affected)	4,308	119	2,894
Invasive plants	3,625	55	1,151
Special Interest Areas	30,775	0	0

There are no additional types of effects to botanical resources beyond those described in Effects Common to All Alternatives that are specific to alternative 2 - modified. In comparison with other alternatives, alternative 2 - modified would have a median potential to affect these botanical resources because the areas designated for OSV use would be moderate in relative acreage, and the required snow depth would be specified at the minimum, but adequate, level of 12 inches.

With alternative 2 - modified 2, OSV use would not be allowed when snow depth is under 12 inches. This level of resource protection is expected to prevent direct effects to non-woody TES and watchlist plants. Indirect effects from snow compaction are expected to be greater with alternatives 1, 2 - modified, and 4 because only the minimum, adequate protection is afforded to ground vegetation. Alternatives 3 and 5 provide a greater assurance of minimizing effects by providing a deeper snow cushion over the ground and vegetation.

Sensitive Plants

Sensitive plant species in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects from snow compaction and pollutants, most likely to be noticeable where they occur in high use areas. *Frangula purshiana* ssp. *ultramafica* is the one Sensitive woody plant known to exist in areas designated for OSV use, and is the species most likely to experience damaging effects from

direct contact. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they may also experience noticeable indirect effects if they occur in high use areas.

With alternative 2 - modified, OSV use would not be allowed when snow depth is under 12 inches. This level of resource protection is expected to prevent direct effects to non-woody Sensitive plants. Indirect effects from snow compaction are expected to be greater with alternatives 1, 2 - modified, and 4 because only the minimum, adequate protection is afforded to ground vegetation. Alternatives 3 and 5 provide a greater assurance of minimizing effects by providing a deeper snow cushion over the ground and vegetation.

Sensitive Plant Determinations for Alternative 2 - modified:

For the one sensitive woody plant species that is present (*Frangula purshiana* ssp. *ultramafica*), due to the potential for direct damage and indirect effects where it occurs in areas designated for OSV use, alternative 2 - modified of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area.**

After evaluating the specific habitat requirements of each species and potential interactions with OSV use, minor indirect effects of snow compaction and/or OSV pollutants would be possible for any of the remaining sensitive plant species present in high OSV-use areas. Therefore, alternative 2 - modified of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area** for *Boechea constancei*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum*, *Bruchia bolanderi*, *Clarkia mildrediae* ssp. *mildrediae*, *Cypripedium fasciculatum*, *Eremogone cliftonii*, *Lewisia kelloggii* ssp. *hutchisonii*, *Lomatium roseanum*, *Peltigera gowardii*, *Penstemon personatus*, and *Penstemon sudans*.

Because the following species are present in the Plumas National Forest, but are not known to exist in areas of high OSV use, alternative 2 - modified of the Plumas OSV Use Designation project would have **no effect** on *Allium jepsonii*, *Astragalus lentiformis*, *Astragalus pulsiferae* var. *coronensis*, *Astragalus pulsiferae* var. *pulsiferae*, *Astragalus webberi*, *Buxbaumia viridis*, *Calycadenia oppositifolia*, *Clarkia gracilis* ssp. *albicaulis*, *Clarkia mosquinii*, *Cypripedium montanum*, *Eleocharis torticulmis*, *Eriogonum umbellatum* var. *ahartii*, *Fissidens pauperculus*, *Fritillaria eastwoodiae*, *Ivesia aperta* var. *aperta*, *Ivesia sericoleuca*, *Juncus luciensis*, *Lewisia cantelovii*, *Lewisia kelloggii* ssp. *kelloggii*, *Meesia uliginosa*, *Monardella follettii*, *Monardella stebbinsii*, *Packera eurycephala* var. *lewisrosei*, *Poa sierrae*, *Pyrrocoma lucida*, and *Sedum albomarginatum*.

Because the following species are not known to exist at all in the Plumas National Forest, alternative 2 - modified of the Plumas OSV Use Designation project would have **no effect** on *Astragalus lemmonii*, *Balsamorhiza macrolepis*, *Botrychium ascendens*, *Botrychium lunaria*, *Botrychium pinnatum*, *Fissidens aphelotaxifolius*, *Dendrocollybia racemosa*, *Helodium blandowii*, *Mielichhoferia elongata*, and *Phaeocollybia olivacea*.

Watchlist Plants

Watchlist plants in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects where they occur in high use areas. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they too may also experience indirect effects if they occur in high use areas.

Where the plants occur, indirect effects from snow compaction are expected to be greater with alternatives 1, 2 - modified, and 4, because only the assumed minimum protection is afforded to ground vegetation. Alternatives 3 and 5 provide a greater assurance of minimizing effects by providing a deeper snow cushion over the ground and vegetation.

Because there is potential for direct damage where they occur in areas designated for OSV use and indirect effects to occurrences in high-use areas, the four woody watchlist plants (*Artemisia tripartata* ssp. *tripartata*, *Hesperocyparis bakeri*, *Hesperocyparis macnabiana*, and *Pinus ponderosa* var. *washoensis*) **may be affected** by alternative 2 - modified 2 of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester's Sensitive Plant List.

Because there is potential for indirect effects to occurrences in high-use areas, 12 of the perennial herbaceous watchlist plants (*Botrychium simplex*, *Carex lasiocarpa*, *Carex scabriuscula*, *Drosera rotundifolia*, *Erigeron lassenianus* var. *deficiens*, *Erigeron petrophilus* var. *sierrensis*, *Erigeron reductus* var. *reductus*, *Meesia triquetra*, *Polystichum lonchitis*, *Sphagnum* spp., *Stellaria longifolia*, and *Viola tomentosa*) and four of the annual watchlist plants (*Bulbostylis capillaris*, *Chenopodium simplex*, *Clarkia mildrediae* ssp. *lutescens*, and *Erythranthe filicifolia*) **may be affected** by alternative 2 - modified of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester's Sensitive Plant List.

For all other watchlist plants not specifically mentioned above, because they are not present in high-use areas, alternative 2 - modified of the Plumas OSV Use Designation project would **not affect** these species.

Special Interest Areas

As with all alternatives, because OSV access is not designated within them, no direct or indirect effects to vegetation are expected to occur in special interest areas.

Alternative 3 Effects to Botanical Resources

Detailed indicators and measures for botanical resources are presented in the specialist report. Table 74 summarizes these same measures by the major analysis topics.

Table 74. Botanical resources indicators and measures for alternative 3

Analysis Topic	Total acres on Plumas National Forest	Acres in high use areas	Acres in areas designated for OSV use
Sensitive plants (19 species possibly affected)	12,568	1,560	5,996
Watchlist plants (21 species could be affected)	4,308	119	1,701
Invasive plants	3,625	38	485
Special Interest Areas	30,775	0	0

There are no additional types of effects to botanical resources beyond those described in Effects Common to All Alternatives that are specific to alternative 3. In comparison with other alternatives, alternative 3 would have the least potential for effects to botanical resources because the fewest acres would be designated for OSV use, and thus fewer TES and watchlist plant occurrences or invasive plant infestations would be present in these areas. In addition, alternative 3 would require a minimum snow depth of 18 inches for cross-country OSV use, providing 6 inches more than the minimum that is assumed to be

adequate to avoid damage to resources. This extra measure of protection may result in fewer impacts to TES and watchlist plants.

Threatened and Endangered Plants

The location of the known *Packera layneae* occurrence and suitable habitats are outside the area that would be designated for OSV use in alternative 3. With OSV use not designated in its occupied and potential habitat, alternative 3 of the Plumas OSV Use Designation project would have **no effect** on *Packera layneae*.

Sensitive Plants

Sensitive plant species in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects from snow compaction and pollutants, most likely to be noticeable where they occur in high use areas. *Frangula purshiana* ssp. *ultramafica* is the one sensitive woody plant known to exist in areas designated for OSV use, and is the species most likely to experience damaging effects from direct contact. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they too may also experience noticeable indirect effects if they occur in high use areas.

Alternative 3 provides an increased level of protection to sensitive plants because an additional 6 inches of snow (for a total of 18 inches) is required for OSV use, providing a deeper cushion to absorb snow compaction and further protection from direct effects to the shortest woody plant species.

Sensitive Plant Determinations for Alternative 3:

For the one Sensitive woody plant species that is present (*Frangula purshiana* ssp. *ultramafica*), due to the potential for direct damage and indirect effects where it occurs in areas designated for OSV use, alternative 3 of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area.**

After evaluating the specific habitat requirements of each species and potential interactions with OSV use, minor indirect effects of snow compaction and/or OSV pollutants would be possible for any of the remaining sensitive plant species present in high OSV-use areas. Therefore, alternative 3 of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area** for *Astragalus lentiformis*, *Astragalus pulsiferae* var. *coronensis*, *Astragalus pulsiferae* var. *pulsiferae*, *Boechera constancei*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum*, *Bruchia bolanderi*, *Clarkia mildrediae* ssp. *mildrediae*, *Cypripedium fasciculatum*, *Eremogone cliftonii*, *Ivesia sericoleuca*, *Lewisia kelloggii* ssp. *hutchisonii*, *Lomatium roseanum*, *Meesia uliginosa*, *Peltigera gowardii*, *Penstemon personatus*, and *Penstemon sudans*.

Because the following species are present in the Plumas National Forest, but are not known to exist in areas of high OSV use, alternative 3 of the Plumas OSV Use Designation project would have **no effect** on *Allium jepsonii*, *Astragalus webberi*, *Buxbaumia viridis*, *Calycadenia oppositifolia*, *Clarkia gracilis* ssp. *albicaulis*, *Clarkia mosquinii*, *Cypripedium montanum*, *Eleocharis torticulmis*, *Eriogonum umbellatum* var. *ahartii*, *Fissidens pauperculus*, *Fritillaria eastwoodiae*, *Ivesia aperta* var. *aperta*, *Juncus luciensis*, *Lewisia cantelovii*, *Lewisia kelloggii* ssp. *kelloggii*, *Monardella follettii*, *Monardella stebbinsii*, *Packera eurycephala* var. *lewisrosei*, *Poa sierrae*, *Pyrocoma lucida*, and *Sedum albomarginatum*.

Because the following species are not known to exist in the Plumas National Forest, alternative 3 of the Plumas OSV Use Designation project would have **no effect** on *Astragalus lemmonii*, *Balsamorhiza macrolepis*, *Botrychium ascendens*, *Botrychium lunaria*, *Botrychium pinnatum*, *Fissidens aphelotaxifolius*, *Dendrocollybia racemosa*, *Helodium blandowii*, *Mielichhoferia elongata*, and *Phaeocollybia olivacea*.

Watchlist Plants

Watchlist plants in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects where they occur in high use areas. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they too may also experience indirect effects if they occur in high use areas.

Alternative 3 provides a moderate level of protection for all watchlist plants because an additional 6 inches of snow is required for OSV use, providing a deeper cushion to absorb snow compaction and further protection from direct effects to the shortest woody plant species. Non-woody watchlist plants are not expected to be directly affected. However, there would still be considerable potential for damage to woody species throughout the OSV season, with potential for unintentional breakage and abrasion of branches and leader growth.

Because there is potential for direct damage where they occur in areas designated for OSV use and indirect effects to occurrences in high use areas, the four woody watchlist plants (*Artemisia tripartata* ssp. *tripartata*, *Hesperocyparis bakeri*, *Hesperocyparis macnabiana*, and *Pinus ponderosa* var. *washoensis*) **may be affected** by alternative 3 of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester's Sensitive Plant List.

Because there is potential for indirect effects to occurrences in high use areas, thirteen of the perennial herbaceous watchlist plants (*Botrychium simplex*, *Carex lasiocarpa*, *Carex scabriuscula*, *Didymodon norrisii*, *Drosera rotundifolia*, *Erigeron lassenianus* var. *deficiens*, *Erigeron petrophilus* var. *sierrensis*, *Erigeron reductus* var. *reductus*, *Meesia triquetra*, *Sphagnum* spp., *Trichodon cylindricus*, *Trifolium lemmonii*, and *Viola tomentosa*), and four of the annual watchlist plants (*Bulbostylis capillaris*, *Chenopodium simplex*, *Clarkia mildrediae* ssp. *lutescens*, and *Erythranthe filicifolia*) **may be affected** by alternative 3 of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester's Sensitive Plant List.

For all other watchlist plants not specifically mentioned above, because they are not present in high use areas, alternative 3 of the Plumas OSV Use Designation project **would not affect** these species.

Special Interest Areas

As with all alternatives, because OSV access not designated within them, no direct or indirect effects to vegetation are expected to occur in special interest areas.

Alternative 4 Effects to Botanical Resources

Detailed indicators and measures for botanical resources are presented in the specialist report. Table 75 summarizes these same measures by the major analysis topics.

Table 75. Botanical resources indicators and measures for alternative 4

Analysis Topic	Total acres on Plumas National Forest	Acres in high use areas	Acres in areas designated for OSV use
Sensitive plants (24 species possibly affected)	12,568	4,394	12,311
Watchlist plants (30 species could be affected)	4,308	1,242	3,940
Invasive plants	3,625	415	3,574
Special Interest Areas	30,775	0	0

There are no additional types of effects to botanical resources beyond those described in Effects Common to All Alternatives that are specific to alternative 4. In comparison with other alternatives, alternative 4 would have the greatest potential for effects to botanical resources, because it would designate OSV use in the second largest area and would designate many more miles of OSV trails, creating more areas of high OSV use.

Alternative 4 would require a minimum snow depth of 12 inches for cross-country OSV use, providing the minimum assumed to be adequate to avoid damage to resources, and about equal with alternatives 1 and 2 - modified in this respect.

Sensitive Plants

Sensitive plant species in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects from snow compaction and pollutants, most likely to be noticeable where they occur in high use areas. *Frangula purshiana* ssp. *ultramafica* is the one Sensitive woody plant known to exist in areas designated for OSV use, and is the species most likely to experience damaging effects from direct contact. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they too may also experience noticeable indirect effects if they occur in high use areas.

With alternative 2 - modified, OSV use would not be allowed when snow depth is under 12 inches. This level of resource protection is expected to prevent direct effects to non-woody sensitive plants. Indirect effects from snow compaction are expected to be greater with alternatives 1, 2 - modified, and 4, because only the minimum, adequate protection is afforded to ground vegetation. Alternatives 3 and 5 provide a greater assurance of minimizing effects by providing a deeper snow cushion over the ground and vegetation.

Sensitive Plant Determinations for Alternative 4:

For the one sensitive woody plant species that is present (*Frangula purshiana* ssp. *ultramafica*), due to the potential for direct damage and indirect effects where it occurs in areas designated for OSV use, alternative 4 of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area.**

After evaluating the specific habitat requirements of each species and potential interactions with OSV use, minor indirect effects of snow compaction and/or OSV pollutants would be possible for any of the remaining sensitive plant species present in high OSV-use areas. Therefore, alternative 4 of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward**

Federal listing or loss of viability in the planning area for *Astragalus lentiformis*, *Astragalus pulsiferae* var. *coronensis*, *Astragalus pulsiferae* var. *pulsiferae*, *Boechera constancei*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum*, *Bruchia bolanderi*, *Clarkia mildrediae* ssp. *mildrediae*, *Cypripedium fasciculatum*, *Cypripedium montanum*, *Eremogone cliftonii*, *Ivesia aperta* var. *aperta*, *Ivesia sericoleuca*, *Lewisia kelloggii* ssp. *hutchisonii*, *Lomatium roseanum*, *Meesia uliginosa*, *Monardella follettii*, *Monardella stebbinsii*, *Peltigera gowardii*, *Penstemon personatus*, *Penstemon sudans*, and *Pyrrocoma lucida*,

Because the following species are present in the Plumas National Forest, but are not known to exist in areas of high OSV use, alternative 4 of the Plumas OSV Use Designation project would have **no effect** on *Allium jepsonii*, *Astragalus webberi*, *Buxbaumia viridis*, *Calycadenia oppositifolia*, *Clarkia gracilis* ssp. *albicaulis*, *Clarkia mosquinii*, *Eleocharis torticulmis*, *Eriogonum umbellatum* var. *ahartii*, *Fissidens pauperculus*, *Fritillaria eastwoodiae*, *Juncus luciensis*, *Lewisia cantelovii*, *Lewisia kelloggii* ssp. *kelloggii*, *Packera eurycephala* var. *lewisrosei*, *Poa sierrae*, and *Sedum albomarginatum*.

Because the following species are not known to exist at all in the Plumas National Forest, alternative 4 of the Plumas OSV Use Designation project would have **no effect** on *Astragalus lemmonii*, *Balsamorhiza macrolepis*, *Botrychium ascendens*, *Botrychium lunaria*, *Botrychium pinnatum*, *Fissidens aphelotaxifolius*, *Dendrocollybia racemosa*, *Helodium blandowii*, *Mielichhoferia elongata*, and *Phaeocollybia olivacea*.

Watchlist Plants

Watchlist plants in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects where they occur in high use areas. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they too may also experience indirect effects if they occur in high use areas.

Because there is potential for direct damage where they occur in areas designated for OSV use and indirect effects to occurrences in high use areas, four woody watchlist plants (*Artemisia tripartata* ssp. *tripartata*, *Hesperocyparis bakeri*, *Hesperocyparis macnabiana*, and *Pinus ponderosa* var. *washoensis*) **may be affected** by alternative 4 of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester's Sensitive Plant List.

Because there is potential for indirect effects to occurrences in high use areas, twenty-one of the perennial herbaceous watchlist plants (*Botrychium simplex*, *Carex lasiocarpa*, *Carex limosa*, *Carex scabriuscula*, *Carex sheldonii*, *Didymodon norrisii*, *Drosera rotundifolia*, *Erigeron lassenianus* var. *deficiens*, *Erigeron petrophilus* var. *sierrensis*, *Erigeron reductus* var. *reductus*, *Ivesia baileyi* var. *baileyi*, *Lomatium foeniculeum* ssp. *macdougallii*, *Meesia triquetra*, *Polystichum lonchitis*, *Rhamnus alnifolia*, *Scutellaria galericulata*, *Sphagnum* spp., *Stellaria longifolia*, *Trichodon cylindricus*, *Trifolium lemmonii*, and *Viola tomentosa*), four of the annual watchlist plants (*Bulbostylis capillaris*, *Chenopodium simplex*, *Clarkia mildrediae* ssp. *lutescens*, and *Erythranthe filicifolia*), and one of the aquatic watchlist plants (*Schoenoplectus subterminalis*), **may be affected** by alternative 4 of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester's Sensitive Plant List.

For all other watchlist plants not specifically mentioned above, because they are not known to be present in high use areas, alternative 4 of the Plumas OSV Use Designation project **would not affect** these species.

Special Interest Areas

As with all alternatives, because OSV access not designated within them, no direct or indirect effects to vegetation are expected to occur in special interest areas.

Alternative 5 Effects to Botanical Resources

Detailed indicators and measures for botanical resources are presented in the specialist report. Table 76 summarizes these same measures by the major analysis topics.

Table 76. Botanical resources indicators and measures for alternative 5

Analysis Topic	Total acres on Plumas National Forest	Acres in high use areas	Acres in areas designated for OSV use
Sensitive plants (19 species possibly affected)	12,568	1,561	6,700
Watchlist plants (22 species could be affected)	4,308	119	2,012
Invasive plants	3,625	38	511
Special Interest Areas	30,775	0	0

There are no additional types of effects to botanical resources beyond those described in Effects Common to All Alternatives that are specific to alternative 5. In comparison with other alternatives, alternative 5 would have the second least potential for effects to botanical resources because fewer acres would be designated for OSV use, and thus fewer TES and watchlist plant occurrences and invasive plant infestations would be present in these areas. In addition, alternative 5 would require a minimum snow depth of 24 inches for cross-country OSV use, providing 12 inches more than the minimum that is assumed to be adequate to avoid damage to resources. This extra measure of protection may result in fewer impacts to watchlist plants.

Sensitive Plants

Sensitive plant species in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects from snow compaction and pollutants, most likely to be noticeable where they occur in high use areas. *Frangula purshiana* ssp. *ultramafica* is the one Sensitive woody plant known to exist in areas designated for OSV use, and is the species most likely to experience damaging effects from direct contact. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they too may also experience noticeable indirect effects if they occur in high use areas.

Alternative 5 provides an increased level of protection to sensitive plants because an additional 12 inches of snow (for a total of 24 inches) is required for OSV use, providing a deeper cushion to absorb snow compaction and further protection from direct effects to the shortest woody plant species.

Sensitive Plant Determinations for Alternative 5:

For the one sensitive woody plant species that is present (*Frangula purshiana* ssp. *ultramafica*), due to the potential for direct damage and indirect effects where it occurs in areas designated for OSV use, alternative 5 of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area.**

After evaluating the specific habitat requirements of each species and potential interactions with OSV use, minor indirect effects of snow compaction and/or OSV pollutants would be possible for any of the remaining sensitive plant species present in high OSV-use areas. Therefore, alternative 5 of the Plumas OSV Use Designation project **may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability in the planning area** for *Astragalus lentiformis*, *Boechera constancei*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum*, *Bruchia bolanderi*, *Clarkia mildrediae* ssp. *mildrediae*, *Cypripedium fasciculatum*, *Eremogone cliftonii*, *Ivesia sericoleuca*, *Lewisia kelloggii* ssp. *hutchisonii*, *Lomatium roseanum*, *Meesia uliginosa*, *Peltigera gowardii*, *Penstemon personatus*, and *Penstemon sudans*.

Because the following species are present in the Plumas National Forest, but are not known to exist in areas of high OSV use, alternative 5 of the Plumas OSV Use Designation project would have **no effect** on *Allium jepsonii*, *Astragalus pulsiferae* var. *coronensis*, *Astragalus pulsiferae* var. *pulsiferae*, *Astragalus webberi*, *Buxbaumia viridis*, *Calycadenia oppositifolia*, *Clarkia gracilis* ssp. *albicaulis*, *Clarkia mosquinii*, *Cypripedium montanum*, *Eleocharis torticulmis*, *Eriogonum umbellatum* var. *ahartii*, *Fissidens pauperculus*, *Fritillaria eastwoodiae*, *Ivesia aperta* var. *aperta*, *Juncus luciensis*, *Lewisia cantelovii*, *Lewisia kelloggii* ssp. *kelloggii*, *Monardella follettii*, *Monardella stebbinsii*, *Packera eurycephala* var. *lewisrosei*, *Poa sierrae*, *Pyrrocoma lucida*, and *Sedum albomarginatum*.

Because the following species are not known to exist in the Plumas National Forest, alternative 5 of the Plumas OSV Use Designation project would have **no effect** on *Astragalus lemmonii*, *Balsamorhiza macrolepis*, *Botrychium ascendens*, *Botrychium lunaria*, *Botrychium pinnatum*, *Fissidens aphelotaxifolius*, *Dendrocollybia racemosa*, *Helodium blandowii*, *Mielichhoferia elongata*, and *Phaeocollybia olivacea*.

Watchlist Plants

Watchlist plants in the various plant life form categories would be affected differently, as described above in Effects Common to All Alternatives. Trees, shrubs, and sub-shrubs (woody plants) may be directly damaged by OSVs where they occur in areas designated for OSV use, and they may also experience indirect effects where they occur in high use areas. Perennial herbaceous species, annual species and aquatic species would not be directly affected, but they too may also experience indirect effects if they occur in high use areas.

Alternative 5 requires a minimum of 24 inches of snow for cross-country and trail OSV use. Twelve inches of snow would be required for trail grooming. In comparison with other alternatives, increasing these minimum snow depths would add an extra measure of protection for TEPS plants and their habitats, but effects already described would still be possible.

In comparison, alternative 5 provides the highest level of protection for all watchlist plants, because an additional 12 inches of snow is required for OSV use, providing a deeper cushion to absorb snow compaction and further protection from direct effects to the shorter woody plant species. Non-woody watchlist plants are not expected to be directly affected. However, there would still be some potential for

damage to woody species throughout the OSV season, with the possibility of unintentional breakage and abrasion of branches and leader growth.

Because there is potential for direct damage where they occur in areas designated for OSV use and indirect effects to occurrences in high use areas, four woody watchlist plants (*Artemisia tripartata* ssp. *tripartata*, *Hesperocyparis bakeri*, *Hesperocyparis macnabiana*, and *Pinus ponderosa* var. *washoensis*) **may be affected** by alternative 5 of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester's Sensitive Plant List.

Because there is potential for indirect effects to occurrences in high use areas, fourteen of the perennial herbaceous watchlist plants (*Botrychium simplex*, *Carex lasiocarpa*, *Carex scabriuscula*, *Didymodon norrisii*, *Drosera rotundifolia*, *Erigeron lassenianus* var. *deficiens*, *Erigeron petrophilus* var. *sierrensis*, *Erigeron reductus* var. *reductus*, *Meesia triquetra*, *Sphagnum* spp., *Stellaria longifolia*, *Trichodon cylindricus*, *Trifolium lemmonii*, and *Viola tomentosa*), and four of the annual watchlist plants (*Bulbostylis capillaris*, *Chenopodium simplex*, *Clarkia mildrediae* ssp. *lutescens*, and *Erythranthe filicifolia*) **may be affected** by alternative 5 of the Plumas OSV Use Designation project, but the possible effects would not contribute to a downward trend or the species being added to the Regional Forester's Sensitive Plant List.

For all other watchlist plants not specifically mentioned above, because they are not known to be present in high use areas, alternative 5 of the Plumas OSV Use Designation project **would not affect** these species.

Special Interest Areas

As with all alternatives, because OSV access not designated within them, no direct or indirect effects to vegetation are expected to occur in special interest areas.

Summary of Botanical Resource Measures and Determinations

Table 77. Botanical resources summary of measures for all alternatives

Analysis Topic	Total acres on Plumas National Forest	Acres in high use areas	Acres in areas designated for OSV use
Sensitive plants	12,568	1,499 Alt. 1 1,499 Alt. 2 1,560 Alt. 3 4,394 Alt. 4 1,561 Alt. 5	12,470 Alt. 1 8,537 Alt. 2 5,996 Alt. 3 12,311 Alt. 4 6,700 Alt. 5
Watchlist plants	4,308	119 Alt. 1 119 Alt. 2 119 Alt. 3 1,242 Alt. 4 119 Alt. 5	3,937 Alt. 1 2,894 Alt. 2 1,701 Alt. 3 3,940 Alt. 4 2,012 Alt. 5
Invasive plants	3,625	36 Alt. 1 55 Alt. 2 38 Alt. 3 415 Alt. 4 38 Alt. 5	3,421 Alt. 1 1,151 Alt. 2 485 Alt. 3 3,574 Alt. 4 511 Alt. 5
Special Interest Areas	30,775	0 all alternatives	0 all alternatives

Another comparison between alternatives is useful, that of the number of watchlist species possibly affected with each alternative.

Table 78. Plant species possibly affected by each alternative

	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Number of Sensitive plant species possibly affected	14	14	19	24	17
Number of Watchlist plant species possibly affected	21	20	21	30	22

TES and Watchlist Plants

Woody TES and watchlist plant species may be directly affected by crushing, breaking, or abrasion of stems and evergreen foliage where they occur in any areas designated for OSV use. Plants of other life form categories would not be directly affected because their living tissues are not present above ground, and would not be directly damaged by OSVs. Any of the TES or watchlist plants may be indirectly affected by snow compaction and/or OSV emissions containing pollutants where they occur in high use areas. Thus, these plant species are reasonably at risk to some level of effects, dependent on their life forms, timing of growth, and proximity to heavy OSV use. Potential indirect effects are expected to be minor. Although some individuals may be damaged or lost, OSV use is not expected to result in a trend toward Federal listing or loss of viability for any sensitive or watchlist plants.

Minimum snow depths or conditional requirements vary among the alternatives, with alternatives 1, 2 - modified, and 4 having similar, minimal requirements that are expected to prevent direct effects to non-woody TES and watchlist plants. Alternative 3 requires a moderate snow depth (18 inches) for OSV uses, and this adds a degree of protection for the shorter woody sensitive and watchlist plants. Alternative 4 requires the deepest snow (24 inches) for OSV use, and this adds an additional degree of protection.

See the botany specialist report for detailed analysis results for each species.

Invasive Plants

Fifty invasive plant species are documented in the project area, and many infestations along roadsides are treated each year. There is some potential for weeds to be introduced to OSV trailheads and into areas designated for OSV use (possibly transported on trailers, towing vehicles, or OSVs), but the other typical factors promoting the spread and establishment of weeds (soil disturbance and vegetation cover reductions) are not expected to occur with the proposed OSV uses. There have been no observations or literature found that point to OSV use causing introduction or spread of invasive plants, but it may be possible, especially at trailheads, where vehicle use is concentrated. Given this uncertainty and the overall lack of evidence of OSV use contributing to weed infestations, the risk of weed increases due to OSV use is expected to be low for all alternatives.

Special Interest Areas

For all alternatives, because OSV access not designated within them, no direct or indirect effects to vegetation are expected to occur in special interest areas, thus protecting the botanic values within them from possible OSV effects.

Compliance with LRMP and Other Relevant Laws, Regulations, Policies and Plans

All alternatives would comply with the Endangered Species Act because no federally listed or proposed species would be affected. With the Biological Evaluation/Biological Assessment, the proposed project effects on TES plants have been evaluated and measures taken to ensure that sensitive plants do not become threatened or endangered because of Forest Service actions. All alternatives would maintain viable populations of all native and desired nonnative plants, and the proposed activities were reviewed for potential effects on rare species, and thus, would be compliant with Forest Service Manual direction. All alternatives would also comply with the Plumas National Forest Land and Resource Management Plan and the Sierra Nevada Forest Plan Amendment because sensitive plant populations would remain viable and their habitats would be maintained.

All alternatives would maintain viable populations of all native and desired nonnative plants, and the proposed activities were reviewed for potential effects on watchlist plants. Because the needs of watchlist plants have been evaluated and protection measures established, the Plumas OSV Designation Project complies with the Forest Plan as amended, the National Forest Management Act, and Forest Service Manual direction.

In addition, noxious and invasive weeds were evaluated for effects from the proposed actions and suitable prevention measures taken, thus complying with the Plumas Forest Plan and Forest Service Manual direction, as well as Executive Order 13112.

Special interest areas with a botanical focus would be managed to preserve the botanic values for which the areas were established, and thus, would comply with the Plumas Forest Plan.

Other Relevant Mandatory Disclosures

Unavoidable Adverse Effects

As described in Effects Common to All Alternatives, TES and watchlist plants in close proximity to OSV trails may be affected by OSV use. Without placing restrictions in areas where these species occur, there could be unavoidable adverse effects to some individuals.

Irreversible and Irretrievable Commitments of Resources

Although some adverse effects to sensitive and watchlist plants may occur, these plants are a renewable resource, and thus, there would be no irreversible commitments of the resource. To a small extent, excessive unauthorized damage to individuals could cause mortality, and thus, may constitute an irretrievable commitment for some sensitive and watchlist plant species.

Socioeconomics

This analysis considers the social and economic consequences of management alternatives to designate trails and areas for public OSV use in the Plumas National Forest. The human environment is central to the purpose and need for this project. OSV use designation in the Plumas National Forest seeks to protect public values related to access, safety, recreational enjoyment, and natural and cultural resources (ecosystem services). This section analyzes the social and economic dimensions of designating trails and areas for public OSV use.

Methodology

Economic Analysis

The economic affected environment was modeled using IMPLAN Professional Version 3.1 with 2014 data. IMPLAN is an input-output model, which estimates the economic contributions of projects, programs, policies on a region on data derived in this analysis from the National Visitor Use Monitoring results 2010. IMPLAN analyzes the direct, indirect, and induced economic contributions. Direct economic contributions are generated by the activity itself, such as visitor spending associated with recreational OSV use in the Plumas National Forest. Indirect employment and labor income contributions occur when a sector purchases supplies and services from other industries in order to produce their product. Induced contributions are the employment and labor income generated as a result of spending new household income generated by direct and indirect employment. The employment estimated is defined as any part-time, seasonal, or full-time job. The IMPLAN database describes the economy in 536 sectors using Federal data from 2014.

The project's effects may result in changes to forest visitation and activities visitors choose to participate in resulting in direct, indirect, and induced economic effects on employment and labor income. Data on recreation visitation by activity is based on National Visitor Use Monitoring (NVUM) results. In most instances, the precise change in visitation due to changes in management is unknown. Therefore, the changes are based on the assumptions developed from professional expertise of Forest Service resource specialists. Regional economic impacts are estimated based on the assumption of full implementation of each alternative. The actual changes in the economy would depend on individuals taking advantage of the resource-related opportunities that would be supported by each alternative. If market conditions or trends in resource use were not conducive to developing some opportunities, the economic impact would be different from what is estimated in this analysis.

The designation of OSV trails and areas may affect recreation visitation and spending related to recreation activities that are snow-dependent, but are not expected to influence national forest recreation visitor and spending patterns beyond these recreational activities. As a result, employment and income changes related to this project are considered in context of contributions to the social and economic environment from snow-dependent activities. The National Visitor Use Monitoring Report provides information on visitor activities and spending patterns related to snow dependent activities including snowmobiling, downhill skiing, and cross-country skiing. Data related to these activities from the NVUM reports from 2005, 2010 and 2015, the California State OSV EIR trailhead survey results and California OSV registration and the changes by alternative from the no action are used to estimate projected effects to the social and economic environment.

Social Analysis

The social analysis assesses baseline social conditions of planning area residents and visitors presented in the Affected Environment section, and considers the social effects of the project based on the interaction of the values, beliefs and attitudes identified in the public comments with estimated changes to resource availability and uses. Key determinants of quality of life that may be affected by OSV designation were identified through the scoping process.

Information Sources

Key data sources for the social and economic analysis include:

- Economic Profile System (EPS), Headwaters Economics

- U.S. Census Bureau, American Community Survey
- U.S. Forest Service, Ecosystem Management Coordination, National Forest Recreation Economic Contributions website (USDA 2018)
- National Visitor Use Monitoring program data for the Plumas National Forest, last collected in FY2015 (USDA 2005; USDA 2010; USDA 2015a; USDA 2015b; USDA 2015c)
- Spending Patterns of Outdoor Recreation Visitors to National Forests (White 2017)
- Public scoping comments

Incomplete and Unavailable Information

Due to incomplete and unavailable information, the socioeconomic analysis uses the following assumptions:

1. The magnitude and direction of supply of recreation opportunity, measured in this analysis as change in acres of reliably predictable high-quality recreation opportunity for OSV use or high-quality non-motorized recreation areas, is one factor of many. Others include population size, proximity to recreation settings, gender, race/ethnicity, education, income, age, and other factors such as technology, climate change, and changing preferences that influence changes in visitation by activity (White and Bowker 2014). This analysis considers change in recreation opportunity supply as one of nine factors equally weighted that would influence recreation visitation and related economic contributions to jobs and labor income.
2. Local economic composition (e.g., sectoral specialization, size of labor market) is constant throughout the analysis period.
3. OSV use generates on average 53 percent more in spending than cross-country ski use (White 2017).
4. OSV trail grooming increases OSV visitor use. 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).
5. OSV use patterns:
 - a. Primarily day use (generally 10:00 am to 3:00 pm; grooming occurs at night).
 - b. OSV use is at the highest on weekends and holidays.
 - c. Highest concentrations of OSV use occur along groomed trails (this is supported by research documented in California State Over-Snow Vehicle Program Draft EIR, 2010).
 - d. Concentrated use at trailheads.
 - e. Higher use in open meadows (concentrated on meadows with groomed trail access) and flatter areas.
 - f. OSV “high marking” occurs primarily on slopes with open vegetation, near groomed trails.
 - g. Data from the National Weather Service’s National Operational Hydrologic Remote Sensing Center were also used to evaluate snowpack trends in the Plumas National Forest. In general, adequate snow occurs in most years above 5,000 feet in elevation with a deeper snowpack evident above 6,000 feet in elevation. In the Plumas National Forest, precipitation often falls as rain

below 5,000 feet, even during the winter months. In some years, adequate snow occurs at lower elevations (3,500 feet), although snow usually does not persist for long periods at lower elevations because the temperatures are too warm, particularly on slopes with a southerly aspect. Businesses are planned, developed and sustained based on reasonably predictable consistent business patterns. While forest lands under 5,000 feet elevation may receive irregular snow storms that provide winter recreation opportunities, these events are not consistent and reliably predictable such as to model or sustain a business or plan consistent and regular gatherings where snowpack is a required attribute. Therefore, areas above 5,000 feet elevation, with less than 70 percent canopy closure on slopes less than 21 percent are considered as reasonably predictable high-quality OSV areas. Effects to social and economic conditions will be analyzed in part based on the change in acreage of reasonably predictable high-quality OSV areas from the no-action alternative. These areas are referred to as high-quality OSV areas in this analysis.

6. A complete census of Forest visitation and participation by recreation activity is not practical nor is it feasible, therefore, Forest visitation and participation by activity estimates are derived from the National Visitor Use Monitoring survey results from 2005, 2010 and 2015, and adjusted based on data provided by the State of California on OSV registrations and OSV trailhead survey results.

Data collected by California State University (CSU) in the 2009 OSV Winter Trailhead Survey estimated that OSV visitation to the Plumas was 22,250. A review of the survey methodology finds this estimate as an upper end estimate, given that trailhead survey was conducted over a 2-month period, February through March, which is typically the peak months for high accumulated snow-depth, and given that the maximum observed weekend visitation was extrapolated over a 4-month period including December, which typically has less snow and lower levels of OSV. Likewise, a review of the National Visitor Use Monitoring (NVUM) survey data associated with winter trailhead use found an unusually low number of survey responses at winter trailheads, which may lend to under estimating the number of OSV and non-motorized winter recreation activities as these figures are largely derived from these surveys, unlike other recreation activities that are estimated by proxy, i.e., other measures that closely reflect level of recreation visitation. For example, downhill skiing participation may be estimated by the number of ski lift tickets sold. Given that the information in the 2009 CSU winter trailhead survey appears to over-estimate OSV visitation on one end, while 2010 NVUM data appears to under-estimate visitation for OSV and non-motorized recreation, a set of assumptions and available data were used to model an estimated visitation rate for 2010. These visitation figures are used to model economic contributions of OSV and cross-country skiing on the Plumas National Forest recreation. The methodology for adjusting OSV and cross-country ski visitation is located in the project record and available upon request.

7. The direct and indirect effects analysis assumes that recreation preferences remain the same and that changes in dispersed winter forest visitation are in part in response to the supply of recreation opportunities provided in the Plumas National Forest.
8. OSV and non-motorized winter recreation visitors have similar characteristics to forest visitors overall (e.g., place of residence).
9. The majority of users travel less than 80 miles in a single day (CaDPR 2010, 2-22). OSV opportunities within 80 miles connected via a motorized trail network or by allowable OSV areas provide an overall array of OSV recreation opportunities for connected regions within the Plumas National Forest and across national forest boundaries.

Spatial and Temporal Context for Effects Analysis

The Plumas National Forest is located in northeastern California. 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 Plumas National Forest’s economic area of influence encompasses Butte, Lassen, Plumas, Nevada, and Sierra counties. These five counties form the social and economic analysis area for this report.

The temporal boundaries for analyzing effects to the social and economic environment extend 10 years into the future (2028). This is the period for which social and economic consequences are foreseeable. Social and economic change, including changes in recreation preferences, cannot plausibly be predicted outside this temporal frame.

Past, present, and reasonably foreseeable future actions considered in the cumulative effects analysis include economic activity and demographic changes in the analysis area. Potential effects to the travel and tourism industry related to snow-dependent recreation activities within the analysis area are considered, including the effects of OSV designation on other national forests within the analysis area (specifically the Tahoe and Lassen National Forests), projects listed in the Plumas National Forest schedule of proposed actions published on April 1, 2018, and climate change.

Resource Indicators and Measures

Table 79. Socioeconomic resource indicators and measures for assessing effects

Resource Element	Resource Indicator	Measure	Used to address: P/N, or key issue?	Source (LRMP S/G; law or policy, BMPs, etc.)?
Economic activity	Employment	Number of jobs and amount of labor income	No	--
Quality of life	Recreation Quality	Per capita measure of Land for OSV & Non-Motorized Snow Recreation	No	--
Quality of life	Values, beliefs, and attitudes	Qualitative evaluation of public values, beliefs, and attitudes	No	--
Environmental Justice	Effects to low-income and minority populations	Qualitative evaluation of disproportionate effects to low-income and minority populations	No	Executive Order 12898

Affected Environment

Existing Condition

Table 80. Socioeconomic resource indicators and measures for the existing condition

Resource Element	Resource Indicator)	Measure
Economic activity	Employment	Number of jobs and amount of labor income
Quality of life	Recreation visitation	Number of recreation visits
Quality of life	Values, beliefs, and attitudes	Qualitative evaluation of public values, beliefs, and attitudes
Environmental Justice	Low-income and minority populations	Identification of low-income and minority populations in the analysis area

Demographic and Economic Characteristics

The Plumas National Forest is located in northeastern California in Butte, Lassen, Plumas, Nevada, and Sierra Counties. The area around the Plumas National Forest is mostly non-metropolitan; the nearest major population center is Chico, located in Butte County, California. It is estimated that 378,415 people living in the five-county analysis area, which grew by 24,041 people, or 6.7 percent between 2000 and 2016 (U.S. Dept. of Commerce, 2017b). The annual change in population in the analysis area remained constant was estimated by the California Department of Finance Demographic Research Unit, the five-county analysis area experienced a 0.5 percent growth from 2017 to 2018. Assuming this rate of change remains constant, the population of the analysis area would grow by 19,571 people to 402,256 people over the next 10 years, representing a 5 percent growth in the population by 2028.

In all but one instance (Lassen County) the counties in the analysis area have higher shares of older residents than their comparative metro and non-metro counties in California. Nevada, Plumas and Sierra Counties have approximately twice the share of residents over the age of 65 compared to California and exceed comparative non-metropolitan counties by 5 to 8 percent. Older populations may have different recreational preferences. For instance, mobility limitations associated with age may increase the importance of easy access to recreational sites. Such considerations as the distance to non-motorized snow play areas would influence use levels for this segment of the population. Communities with a higher share of elder people may also exhibit different economic characteristics.

The economic characteristics described below and displayed in table 82 suggest that changes in local employment and income may be felt to varying degrees across the analysis area given the current economic characteristics and demographic composition of communities.

Unemployment figures describe the percentage of people over 16 years of age who are jobless and actively looking for work. High unemployment may indicate weak market development and few employment opportunities. Unemployment in the analysis area was largely on par with the State's unemployment rate, with the notable exception of Sierra County, which was close to five percent lower than the State's rate. Also worth noting is Plumas County's unemployment rate, which exceeded the State's rate by three percent.

Table 81. Demographic characteristics by county

Location	Population (ACS 2016 5-year estimate)	Rural-Urban Continuum Code (ERS 2013)	Share of Population Over 65 (ACS 2016 5-year estimate)
Butte County	223,877	Metro - Counties in metro areas of fewer than 250,000 population	17.04%
Lassen County	31,945	Nonmetro - Urban population of 2,500 to 19,999, not adjacent to a metro area	12.28%
Nevada County	98,639	Nonmetro - Urban population of 20,000 or more, adjacent to a metro area	23.41%
Plumas County	18,754	Nonmetro - Urban population of 2,500 to 19,999, not adjacent to a metro area	24.92%
Sierra County	2,931	Nonmetro - Completely rural or less than 2,500 urban population, adjacent to a metro area	26.07%
Non-Metro California	1,895,617	--	18.7%

Location	Population (ACS 2016 5-year estimate)	Rural-Urban Continuum Code (ERS 2013)	Share of Population Over 65 (ACS 2016 5-year estimate)
Metro California	36,758,589	--	12.6%
California	38,654,206	--	12.8%

Source: U.S. Census Bureau 2017 and USDA ERS 2013

Median household incomes give a sense for the quality of employment opportunities. Median household incomes (MHI) are lower in all five counties than comparative populations, however, Sierra and Butte Counties' MHI is the lowest at 72 percent and 69 percent, respectively, of comparative non-metro and metro counties MHI in California. Lassen, Nevada, and Plumas counties had the highest median household incomes within the analysis area; however, they lagged behind comparative MHI of other non-metro counties by between \$2,500 in Nevada County and \$10,500 in Plumas County.

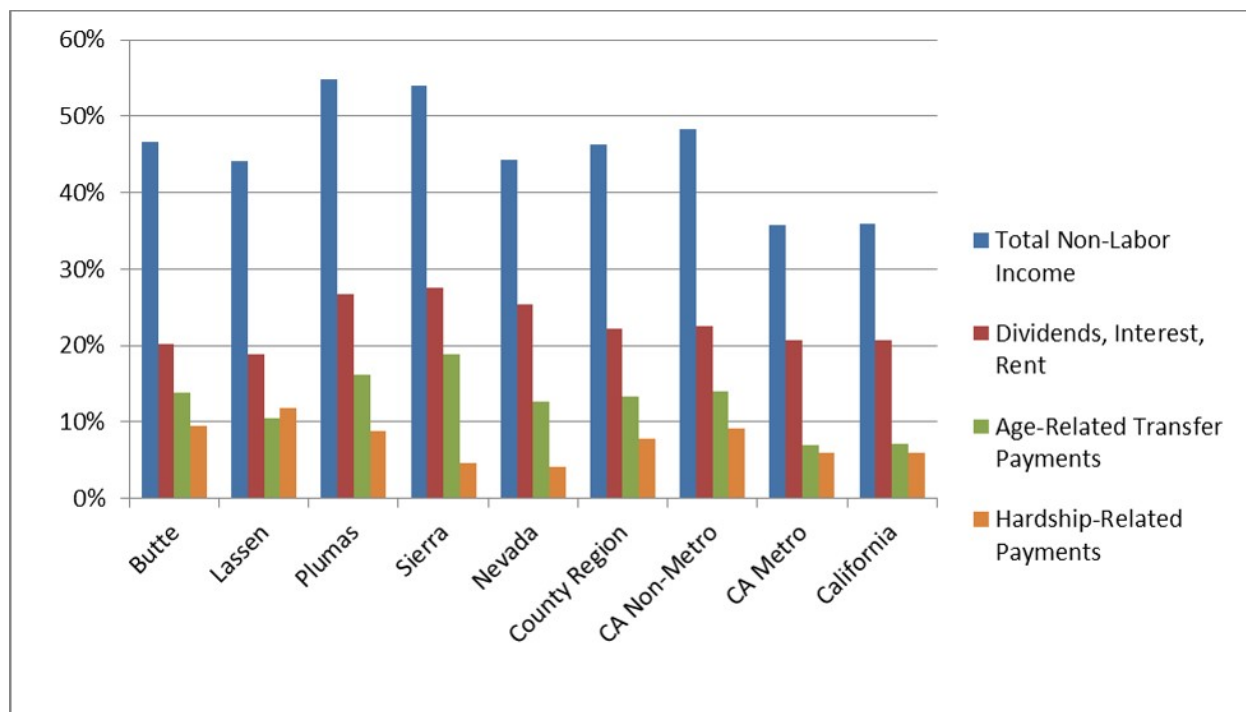
Table 82. Economic characteristics by county

Location	Median Household Income (ACS 2016 5-year estimate)	Unemployment Rate (ACS 2016 5-year estimate)
Butte County	\$44,366	10.7%
Lassen County	\$51,457	9.4%
Nevada County	\$57,429	8.8%
Plumas County	\$50,125	11.8%
Sierra County	\$43,984	3.9%
California *Metro	\$63,965	8.7%
California Non-Metro	\$60,898	8.7%

Source: U.S. Census Bureau 2016, U.S. Census Bureau 2017.

Rural counties in the west have experienced a rapid growth in the portion of non-labor income (NLI) over the past 10 years and in general have higher shares of non-labor income than non-metropolitan counties (Lawson et al. 2014). Non-labor income is primarily comprised of dividends from investments, age related payments, and hardship payments. Counties with a high share of non-labor income are vulnerable to larger economic fluctuations in domestic and global markets, changes in public policy, and the influences of demographic trends which are beyond the influence of the Forest.

Overall, the analysis area's percentage of NLI exceeded the State's and metro counties, but was slightly below other non-metro counties share. As figure 14 shows, Lassen County's share of hardship payments was roughly 3 percent higher than non-metro counties. Three percent is not considered considerably greater, however, it is worth noting as this may suggest a higher level of vulnerability to changing economic conditions as hardship payments are associated with lower household income and educational attainment, poverty, unemployment and a shrinking population (Lawson et al. 2014). On the other hand, Plumas, Nevada and Sierra Counties NLI from dividends, interest, and rent was approximately 3 to 5 percent more than other non-metro populations. Higher investment-related NLI is associated with older populations, higher educational attainment, and larger health care, construction, and real estate sectors.

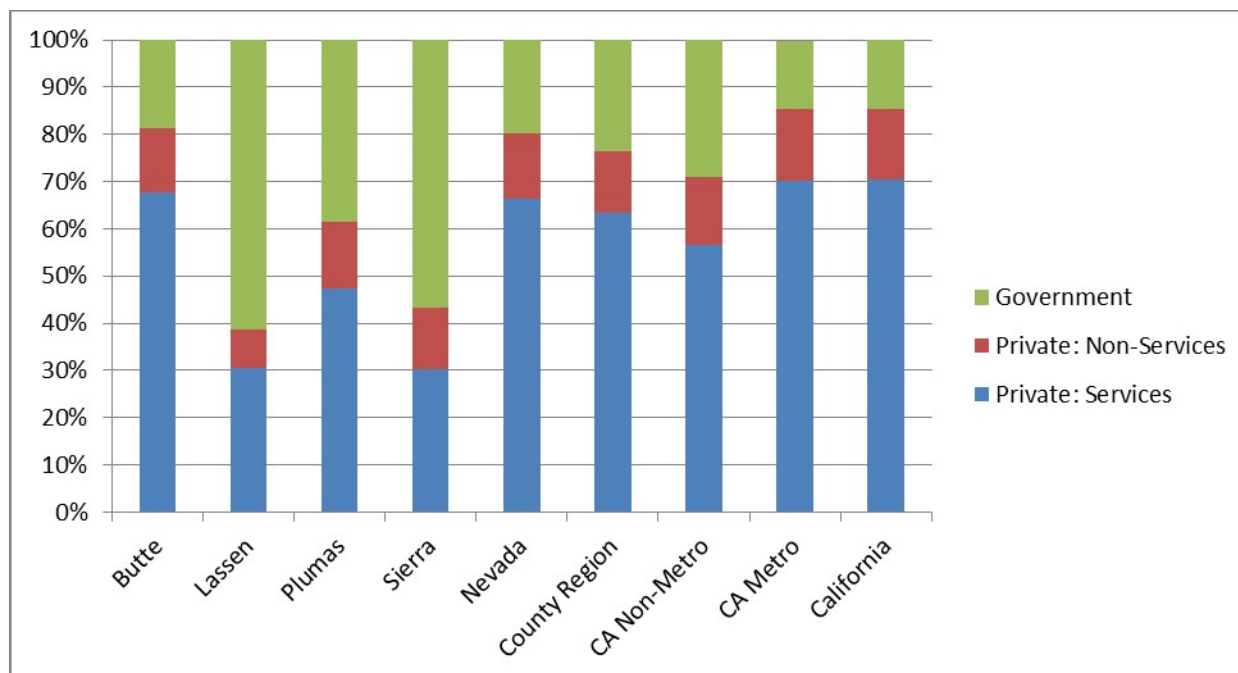


Source: U.S. Department of Commerce, 2017

Figure 14. Percentage of personal income from non-labor income by type of payment, 2016

The relative portion of private to government employment by county is shown in figure 15. This project is not expected to have an effect on the government or private non-services sector which includes construction, manufacturing and natural resource commodities such as timber and mining. The project may affect the recreation opportunities and visitation to the forest which may impact the private services sector, which includes leisure and hospitality, profession and business, and financial activities to name a few.

When viewing the analysis area as a whole, referred to as the ‘County Region’ in figure 15, the portion of government and private sector employment is largely similar to that of other non-metro counties, but generally has more employment in private services and less in government than non-metro counties on average. Notably, Lassen and Sierra Counties employment in the private services sector was approximately 40 percent less than the comparative non-metro population. Plumas County also lagged behind the comparative measure by 20 percent in private services employment. The relatively small portion of employment in private services, suggests that market development in Lassen, Sierra and Plumas Counties is weak and that private services currently play a relatively small role in the economic foundation of these counties.

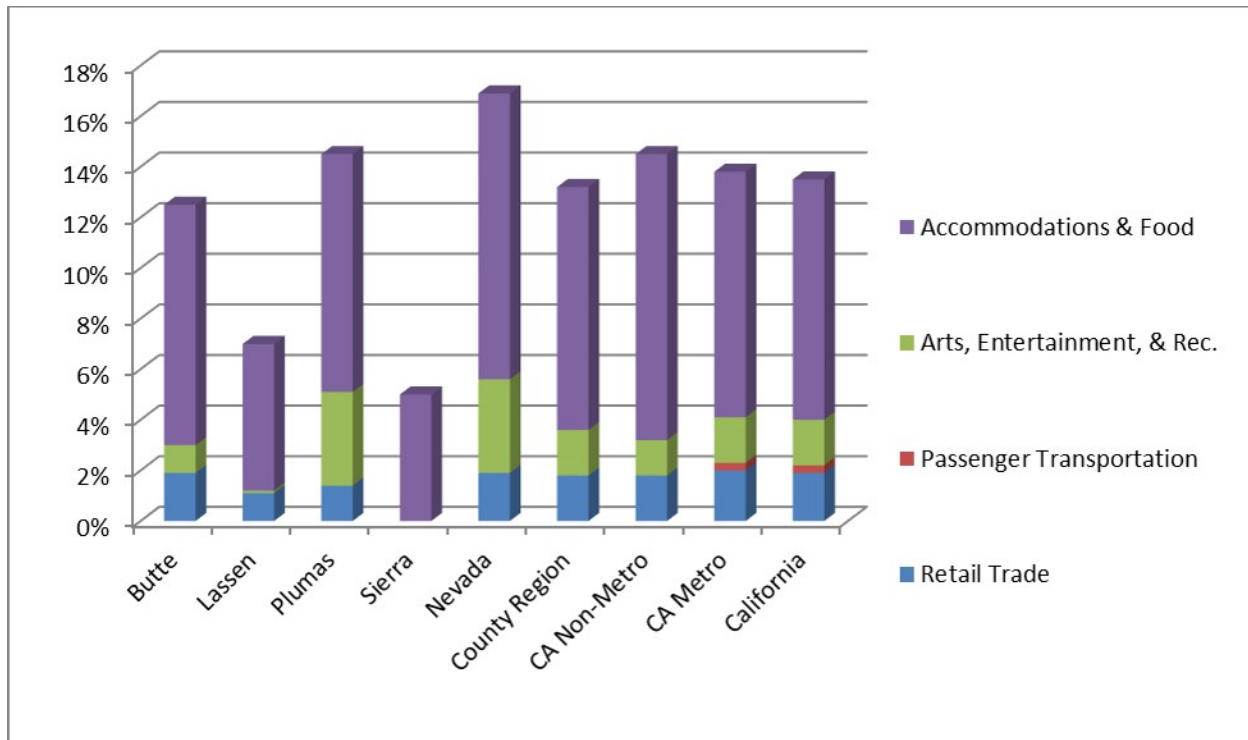


Source: U.S. Department of Labor 2017

Figure 15. Percent employment in private sectors and government by county, 2016

Plumas National Forest recreation visitors spend money on lodging, food, fuel, and other goods and services in the economic analysis area. Changes in OSV use and other snow-dependent winter activities, such as cross-country skiing, may affect winter visitation to the Forest and related visitor spending that may in turn affect jobs and income in these communities. Additionally, visitor spending contributes to county and municipal revenue from lodging and sales taxes. Tax revenues are used to fund essential public services, such as emergency management. It should also be noted that State revenues are generated from the registration of OSVs and fund trail grooming and the plowing of designated Sno-Park trailheads.

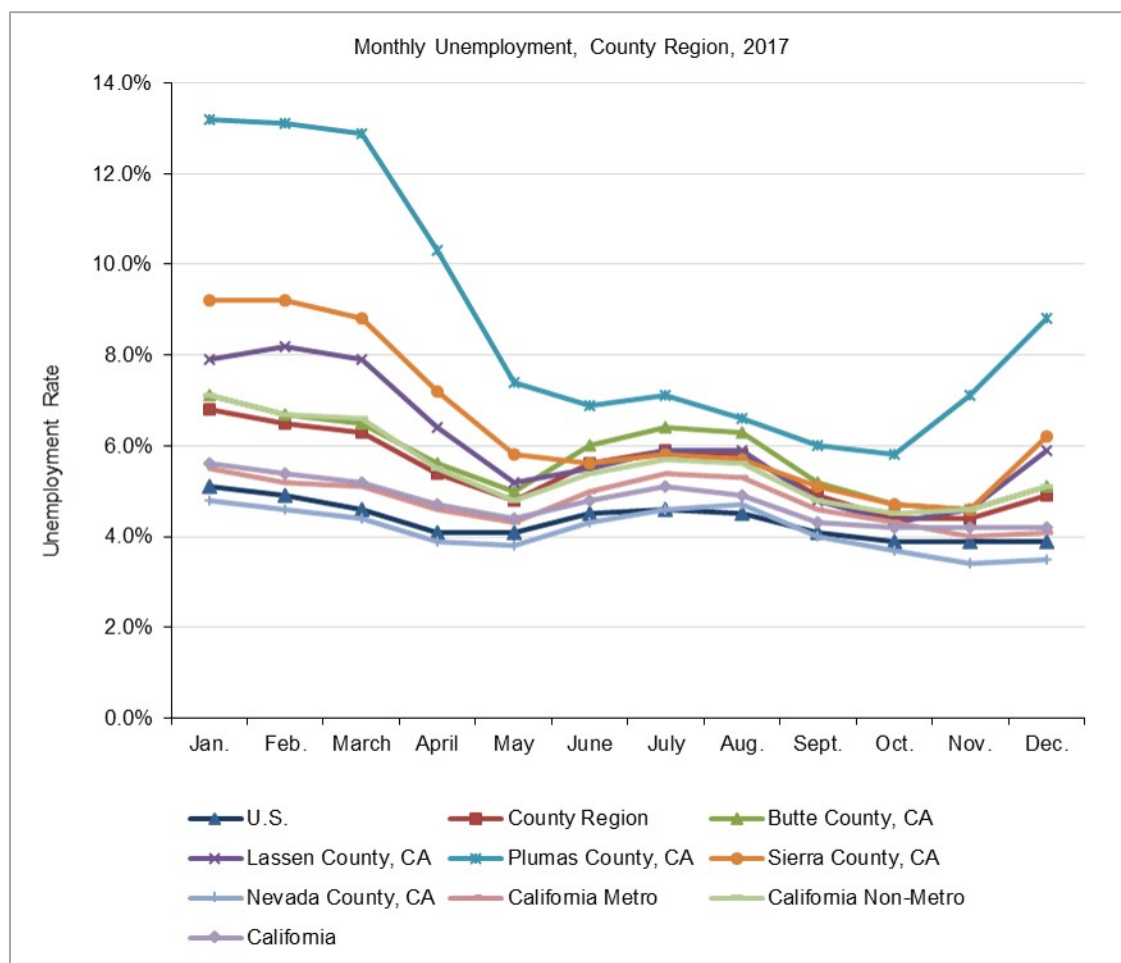
Figure 16 shows the percentages of total private employment in travel and tourism industries by county. The analysis area, or County Region, is largely similar to California in respect to the proportions of the four sectors included within the travel and tourism industry. To note, private employment in travel and tourism in Sierra County is limited to the accommodations and food sector, while Lassen County has only slightly more diversity with 1 percent of employment in retail trade. Conversely, jobs in Nevada and Plumas Counties in the arts, entertainment and recreation sector are twice the share that they are in comparative non-metro counties. Nevada County has the greatest share of employment in the travel and tourism industry suggesting it may be affected to a greater degree by changes in forest visitation than other counties less reliant on travel and tourism.



Source: U.S. Department of Labor, 2017

Figure 16. Travel and tourism industries as a percent of total private employment by county, 2016

Monthly employment, illustrated in figure 17 provides a measure of the relative amount of employment directly influenced by seasonality. Of interest to this analysis are employment rates in the winter months, typically mid-December through mid-March when snow-dependent industries in the travel and tourism sector would be directly affected, versus the remainder of the year. As shown in figure 17, unemployment in the analysis area fluctuated seasonally to varying degrees throughout 2017. Plumas, Lassen and Sierra Counties unemployment had the highest unemployment rates in the winter and also demonstrated a greater disparity in seasonal unemployment rates ranging between a six and three percent difference throughout the year. Notably, unemployment rates in Plumas County are nearly twice that of what they are in the summer months. Higher unemployment rates in the winter suggest that employment in the travel and tourism sectors from winter based recreation is not currently a strong driver of the employment in this industry. Butte County's unemployment rate fluctuated by two percent, with summer and winter rates being nearly equal. Nevada County demonstrated the most stability in employment throughout the year, fluctuating by less than 1 percent, suggesting a relatively robust and diversified economy.



Source: US Department of Labor 2018.

Figure 17. Monthly unemployment by county, 2017

Recreation Visitors in 2005, 2010, and 2015

NVUM data were collected in the Plumas National Forest in fiscal years 2005, 2010, and most recently in 2015. According to NVUM results, annual forest visits peaked in 2010 and declined by a third in 2015, its lowest visitation within the three survey years. The adjusted visitation figures for this analysis is 570,824²⁵ in 2010. Visitation to the general forest area, versus day-use developed sites, overnight-use developed sites, and designated wilderness areas, was consistently the most popular destination over the three survey years.

Age

Figure 18 illustrates the ages of visitors to the Plumas National Forest for the three NVUM survey years 2005, 2010, and 2015. The demographic of visitors to the Plumas National Forest aged between 2005 and 2015. In 2005, the largest age group over 16 years of age was between 40 to 49 years old, followed by the 50-59 age group. In 2015, the largest age group over 16 years of age was the aged 50 to 59 years, followed by the 60 to 69 age group. While the ‘under 16’ age group accounts for a smaller share of

²⁵ This figure is adjusted per the reasons described in the Methodology section and outlined in the “incomplete and unavailable information” section of this analysis.

visitors in 2015 than it did in 2005, the 16 to 29 age group grew in proportion to its share in 2005. Changes in population age groups visiting the Forest may indicate changing preferences and needs related to recreation activities.

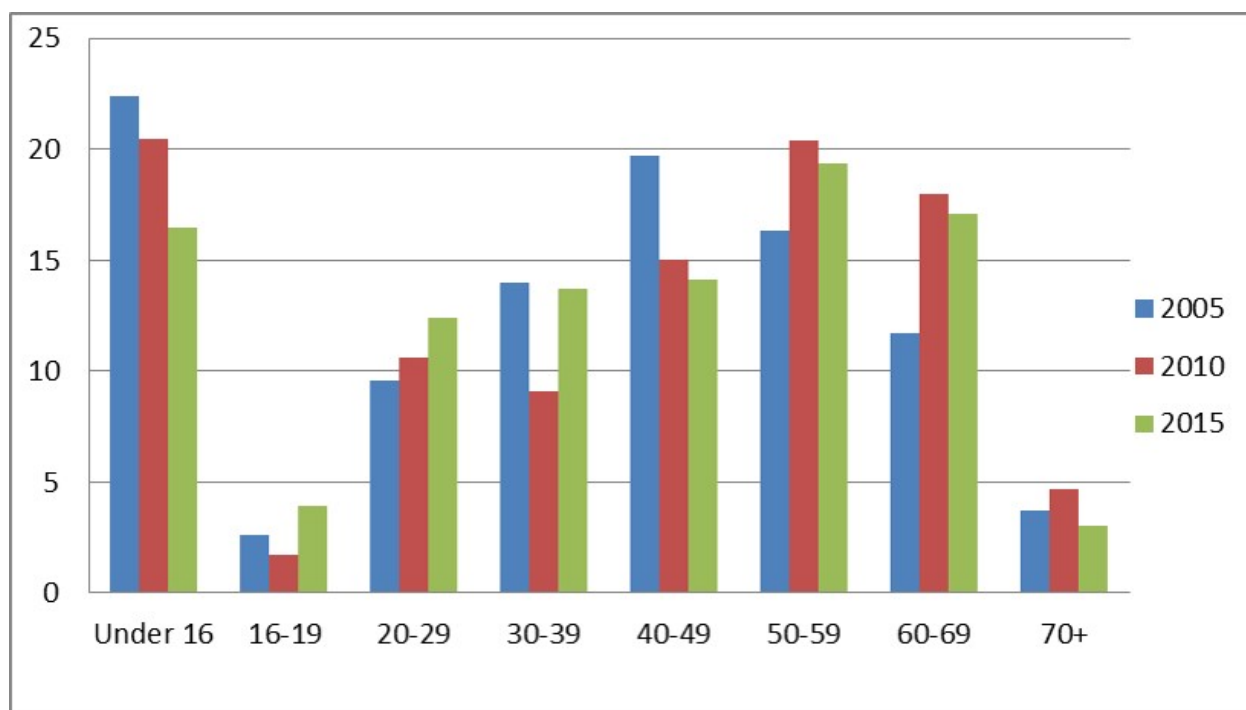


Figure 18. Plumas National Forest visits by age, 2005, 2010, and 2015

Distance Traveled and Place of Origin

Distance visitors travelled to recreation sites in 2005, 2010 and 2015 are shown in figure 19. Site visits by people originating from over 100 miles away decreased by over eight percent since 2010. The great majority of forest visitors traveled fewer than 100 miles to reach the recreation site, which accounted for 83.2 percent of visitors in 2015, which was an increase of over 8 percent since 2010. Visitors in 2015 were more apt to travel between 26 and 100 miles to visit the Forest than those in 2010. An increase in the number of visitors originating within 100 miles of the recreation site may be due to the increasing number of retired people who may have more time for travelling further distances for day visits; however, visitation from people travelling from afar, over 100 miles, appears to be declining.

In 2015, close to one-third of (21.1 percent) of all Forest visits originated from the communities in and surrounding Quincy and Portola in Plumas County. The NVUM data do not break out visitor origin by activity type. Therefore, the analysis assumes that OSV and non-motorized winter recreation visitors reside in the same areas as forest visitors overall.

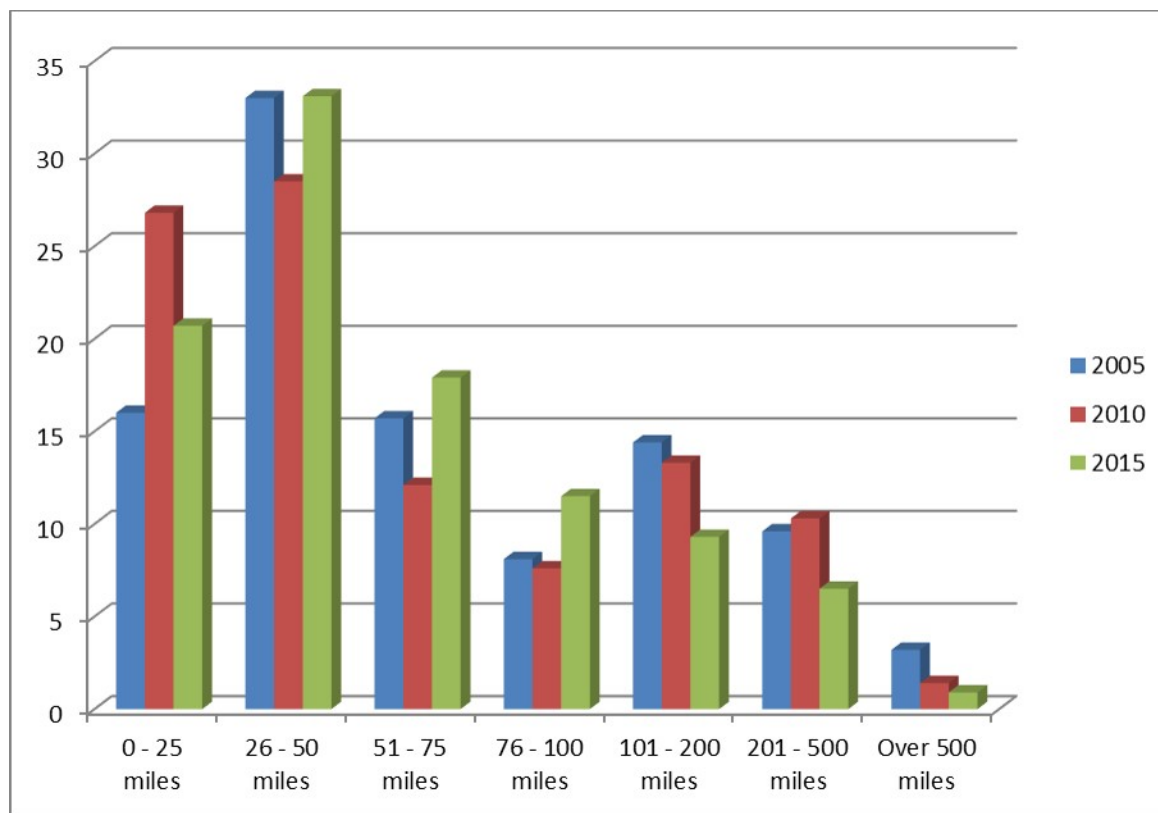


Figure 19. Percentage of Plumas National Forest visits by distance traveled

Participation in Recreation Activities

The ten most popular recreation activities surveyed in 2015 and how these activities rated as primary activities in 2010 and 2005 is shown in figure 20.

Eight of the most popular activities remained the same between 2005, 2010, and 2015; however, the percentage of participation shifted, which may indicate changing preferences in the visitor population. Developed camping rated as the top activity of 2015. Over the 15-year period, the NVUM results show that developed camping, viewing natural features, relaxing, motorized water activities, driving for pleasure, and other non-motorized activities increased as a percentage of the main recreation activity. On the other hand, hiking and walking, viewing wildlife, and fishing declined as a percentage of the main recreation activity.

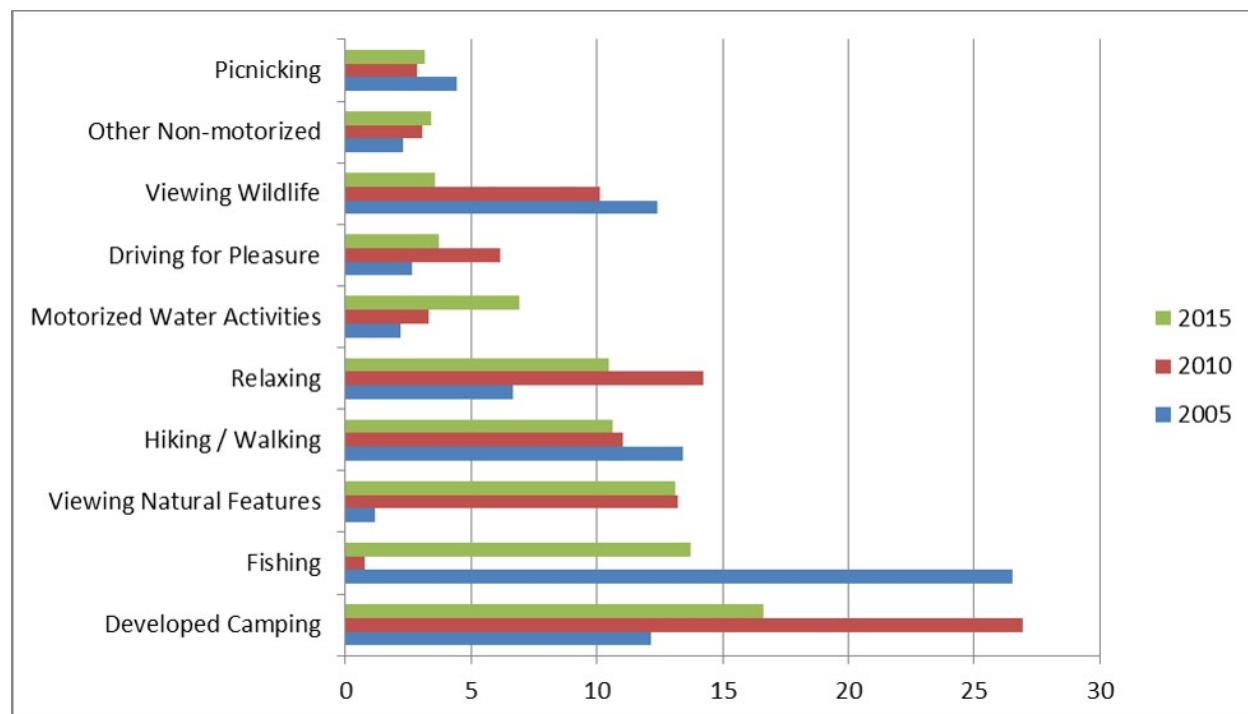


Figure 20. Ten most popular activities by forest visitors, 2015

Dispersed winter recreation activities rated considerably lower in the percentage of visitor participation. As displayed in figure 21, NVUM survey results in 2015 identified no activity in snow-dependent winter sports such as cross-country skiing, downhill skiing and snowmobiling. This may be in part due to the low numbers of participants interviewed at winter recreation trailheads. As such, it is difficult to draw conclusions from the limited NVUM survey results on trends related to snow-dependent dispersed winter activities in the Forest. Therefore figures from the NVUM results for 2010, along with the California Winter Trailhead Survey data 2009 to 2010, and California OSV registrations 2009 to 2014 displayed in table 83, are considered as a basis to model adjusted recreation visitation for snow-dependent winter dispersed recreation, in other words, snowmobiling and cross-country skiing, in the socioeconomic analysis area.

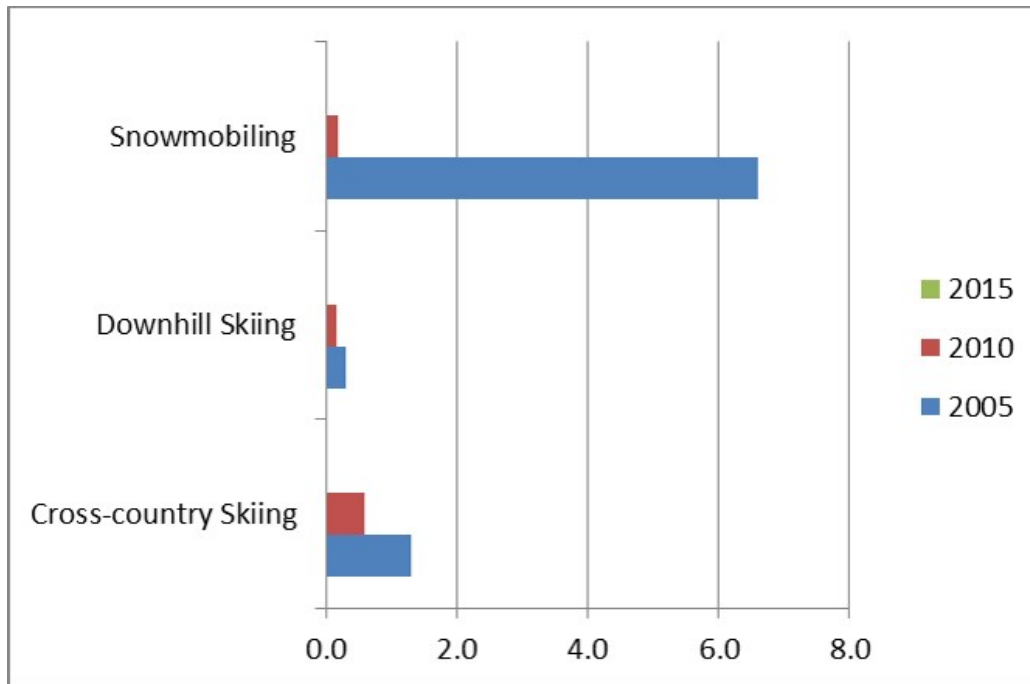


Figure 21. Percentage of participation in snow-based activities, national visitor use monitoring data 2005, 2010, and 2015

Data in table 83 on annual OSV registration within California provide insight into OSV recreation trends within the economic analysis area, as well as trends at the state level. Data from the California Department of Motor Vehicles show an overall decrease of 3.9 percent between 2009 and 2018, in annual OSV registration in the analysis area, Butte, Lassen, Nevada, Plumas, and Sierra Counties. The greatest decrease in OSV registration by county was experienced in Lassen County, which declined by 22.1 percent, followed by Plumas County, which declined by 20.6 percent over the 10-year period. This decline in OSV registration was also experienced at the state level, as registration by California residents declined by 1.7 percent, and registration by out-of-state residents declined by 35.8 percent.

The trends shown in figure 22 and figure 23 demonstrate that while OSV registration has declined from 2009 to 2018, these changes have been dominated by trends in two periods, 2009-2014 and 2014-2019. Figure 22 displays trends in OSV registration from 2009 to 2014. During this period, OSV registration trended negatively, declining somewhat steadily in all categories. However, when considering trends over the 10-year period including 2014 to 2018, as depicted in figure 23, OSV registration trended positively, gaining in all categories but one, out-of-state resident registrations which continues to decline.

The decline in OSV registration during the first five years—2009 to 2014—is likely due to the national economic events of 2008 associated with the housing crisis. The period following the collapse of the housing market was a period of economic recovery exhibited by slow economic growth and reduced market activity. By 2014, the economy showed over five years of continual gains in jobs and market activity and would not be likely to have negatively influenced OSV participation rates.

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Table 83. California OSV registration 2009 to 2018

Area of Analysis	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	10-year Change
Butte	1,093	1,054	1,057	991	1,014	955	1,101	1,126	1,025	1,146	4.8%
Lassen	394	364	352	322	315	279	333	327	285	307	-22.1%
Nevada	1,037	1,066	1,023	1,020	1,041	1,030	1,166	1,234	1,072	1,200	15.7%
Plumas	1,236	1,180	1,111	1,025	1,022	920	1,027	1,053	930	581	-20.6%
Sierra	223	220	205	208	207	192	214	212	194	196	-12.6%
Combined 5-County Analysis Area	3,983	3,884	3,748	3,566	3,599	3,376	3,841	3,952	3,506	3,829	
Annual Change		-2.49%	-3.50%	-4.86%	0.93%	-6.20%	13.77%	-2.81%	-11.29%	9.21%	-3.9%
California Residents Annual Change	18,542	17,982	17,776	16,956	16,926	16,189	18,200	18,663	16,679	18,232	
Annual Change		-3.02%	-1.15%	-4.61%	-0.16%	-4.37%	12.42%	2.54%	-10.63%	9.31%	-1.67%
Out of State Residents	260	242	235	244	215	197	224	181	147	167	
Annual Change		-6.92%	-2.89%	3.83%	-11.89%	-8.37%	13.71%	-19.20	-18.78%	13.61%	-35.77%
All OSV Registration in California	18,802	18,224	18,011	17,200	17,144	16,386	18,424	18,844	16,826	18,399	
Annual Change		-3.07%	-1.17%	-4.50%	-0.33%	-4.42%	12.44%	2.28%	-10.71%	9.35%	-2.14%

The period from 2014 to 2019 was marked by extreme highs and lows in OSV registration for California residents, this may be in response to and in anticipation of the continued drought in the Sierra Nevada Mountains from 2012 to 2015. OSV registration declined the most in this period between 2016 and 2017, just as the Sierras began to receive higher level of snowfall. The data suggests that trends in OSV participation are responsive to many factors, such as the national economy and climate trends, that are beyond the influence of the Plumas National Forest.



Figure 22. 2009–2014, trends in California OSV Registration, Five County Analysis Area, California Residents, Out of State Residents, All OSV Registration (CADMV 2018)

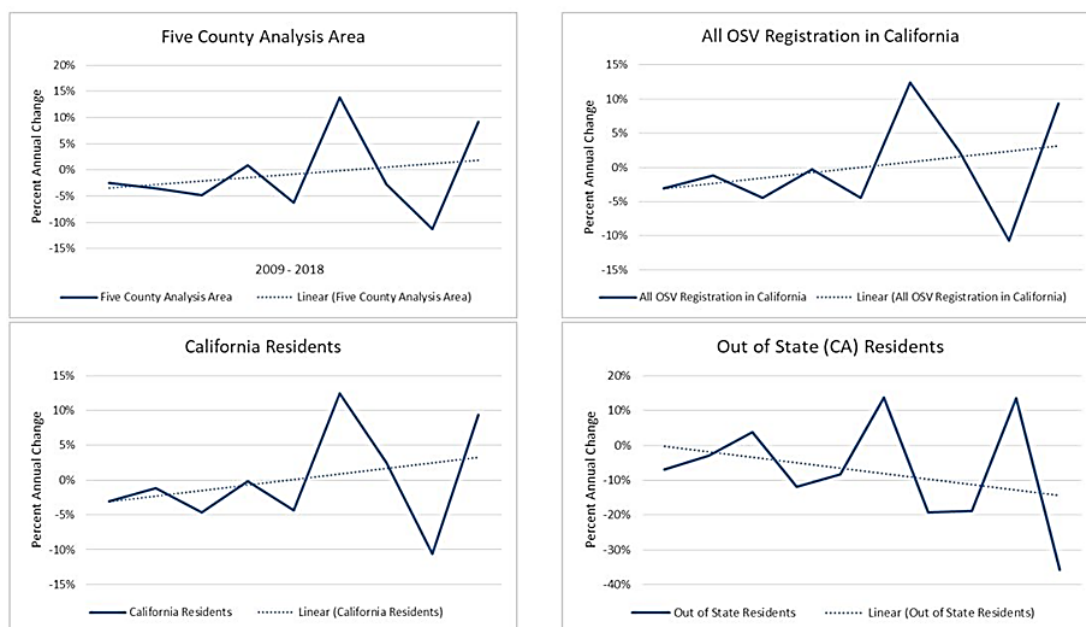


Figure 23. 2009–2018 Trends in California OSV Registration, Five County Analysis Area, California Residents, Out of State Residents, All OSV Registration (CADMV 2018)

Data collected by California State University in the 2009 OSV Winter Trailhead Survey estimated that OSV visitation to the Plumas was 22,250. State revenues are generated from the registration of OSVs and fund trail grooming and the plowing of designated Sno-Park trailheads.

The results of the modeled visitation using data from NVUM results for 2010, along with the California Winter Trailhead Survey data 2009–2010, and California OSV registrations 2009–2010 are displayed in table 84 and would have that 2.0 percent of forest visitors or 11,469 visitors participated in OSV and 6.6 percent of forest visitors or 37,563 visitors participated in cross-country skiing in 2010.

Table 84. Adjusted dispersed winter recreation participation as a percent of visitation, 2010

Activity	Percent Participation
Snowmobiling	2.0%
Cross-countryskiing	6.6%

In the Federal Outdoor Recreation Trends: Effects on Economic Opportunities working paper by Eric White, and J.M Bowker et al. (2014), the results of projections in 17 outdoor recreation activities were presented. These projections were developed from a model created for the 2010 Resources Planning Act applied in combination with information on changing land use, demographics, and climate data to model future recreation participation were outdoor recreation activities including OSV and non-motorized snow based recreation. It is estimated that in 2008, 4 percent of the nation’s population participated in OSV use. OSV use is projected to have one of the largest declines in participation rates, declining by 10 percent of current users by 2030 down to a participation rate of 3.6 percent. The study notes that OSV recreation is limited to adequate snow conditions and recreation opportunities. Regarding non-motorized winter activities for “undeveloped skiing,” specifically cross-country skiing and snowshoeing, it is estimated that 3.3 percent of the Nation’s population currently participate in non-motorized snow recreation. Looking out to 2030, the participation rate is expected to remain at 3.3 percent; however, days per participant are expected to increase slightly.

Economic Contributions

Visitors to national forests spend money on lodging, restaurants, gasoline, entry fees, and souvenirs. These purchases support employment and labor income in communities that surround NFS lands. Visitor spending is influenced by both the type of trip (local or non-local; day or overnight) and the type of recreation activities. Snowmobilers spend more than most other recreation visitors (White and Stynes 2010). The NVUM survey collects data on “previous and planned spending of the entire recreation party within 50 miles of the interview site during the trip to the area” (White and Stynes 2010). These data indicate that a snowmobiler spends an average of \$642 (\$2007) on a non-local overnight trip and \$74 (\$2007) on a local day trip, compared to \$366 (\$2007) and \$34 (\$2007) for the same types of trips among participants of all recreation activities (White and Stynes 2010). Therefore, snowmobilers spend on average nearly twice the amount other recreation user spend.

Table 85 displays the adjusted forest visitation in 2010 and associated economic contributions modeled from NVUM monitoring results from 2010 on recreation visitation (all activities and trip types), the State EIR trailhead survey data and the State OSV registration figures from 2009 to 2010. It is estimated that recreation visitation to the Plumas National Forest supported approximately 191 total jobs²⁶ and

²⁶ The economic modeling software (IMPLAN) reports jobs as average annual full-time and part-time jobs. No distinction is made between full-time and part-time employment, so the job calculations in this report are not full-time equivalents (FTEs). However, the duration of employment is used to calculate the number of jobs. Therefore,

\$6.5 million (\$2014) in labor income. Given that snowmobilers spend nearly twice as much per visit than participants of other recreation activities, it is important to consider how the project may affect visitation and associated spending related to over-snow vehicle use in the Plumas National Forest. It is important as well to consider the economic impacts of the project on non-motorized winter recreation, such as cross-country skiing, given the sizeable visitation for this activity.

Table 85. Adjusted visitation and economic contributions for OSV and cross-country

Visitation, Participation, or Income	Contributions
Total Visitation*	570,824
OSV Activity Participation	11,469
Percent Activity Participation	2.0%
Cross-countryski activity participation	37,563
Percent cross-countryski participation	6.6%
Jobs from Recreation	191
Labor Income from Recreation (\$2014)	\$6,517,754

*Adjusted visitation and economic contribution modeled from 2010 NVUM results, State EIR trailhead survey, and State OSV Registration.

Values, Beliefs, and Attitudes

Values are “relatively general, yet enduring, conceptions of what is good or bad, right or wrong, desirable or undesirable.”

Beliefs are “judgments about what is true or false – judgments about what attributes are linked to a given object. Beliefs can also link actions to effects.”

Attitudes are “tendencies to react favorably or unfavorably to a situation, individual, object, or concept. They arise in part from a person’s values and beliefs regarding the attitude object” (Allen et al. 2009).

OSV trail and area designation may affect nearby residents and visitors to the Plumas National Forest. Public comments received during the scoping process provide insight into the values, beliefs, and attitudes of stakeholders in the OSV designation process. Commenters voiced a diversity of beliefs regarding how the project would affect resources they value. At the heart of this diverse commentary is a central thread that unites all of those who attended public meetings or submitted public comments, which was the immense value they place on public lands. Central to these public values are beliefs about how OSV designation in the Plumas National Forest will affect their quality of life.

Topics addressed identified questions about who (e.g., local and non-local; OSV recreationists or non-motorized recreationists) should be given preference in the project decision-making process and why (e.g., economic contribution to communities, size of user group, or personal history) some question the legitimacy of the project in incorporating local knowledge and even the need to designate OSV use, as some people see only risks and no benefits from OSV designation. Others are highly motivated to enhance natural resource conditions and see benefits rather than risks in designating OSV use in the forest. Some winter recreationists enjoy both motorized and non-motorized recreation, while other recreationists are exclusively in the motorized or non-motorized recreation group. Some believe that designating OSV will result in the loss of OSV opportunities, while others believe OSV designation will

1 full-time or part-time job lasting 1 year is equivalent to 2 full-time or part-time jobs lasting 6 months each. Both of these examples will be reported as 1 job in this analysis.

provide opportunities currently not available to non-motorized recreationists. Following are some of the comments that demonstrate attitudes and underlying beliefs within the public sphere regarding the project's need, decision making process and how they believe the project would affect their quality of life and the values they associate with snow-dependent recreation in the Plumas National Forest.

Legitimacy of the Need to Designate OSV Use

"It appears that the forest service has gone straight to closures for motor vehicles without considering other options. Why did the forest service not consider other rules such as imposing a speed limit within a predetermined distance from a non-motor user of the forest land?" (Comment 116-2)

"I propose no changes to the use of the plumas national forest, and allowing people to continue to use the public land as we have been doing in the winter. I never hear of damage caused by snowmobiles." (Comment 123-3)

"Unless there is evidentiary proof that oversnow motorized travel, at these particular Forests is damaging the environment and/or wildlife, it is wrong to further limit our enjoyment of these forms of recreation." (Comment 131-2)

"Please do not create user-conflicts by introducing exclusive-use areas. Otherwise, please study and demonstrate a need for no-OSV areas (or exclusive XC ski areas) because of documented conflicts and insufficient alternative areas for XC skiers to explore. In my experience, there are simply not "too many" users in this area, and "conflicts" are rare and generally confined to parking areas and trailheads-not the back woods." (Comment 174-3)

"We can all get along, lets not create conflict with lines on a map that are not needed for a specific purpose." (Comment 160-1)

"I am an avid cross-country skier having averaged 25-30 ski days a year for almost 40 years. I feel that increasing limitations to motorized vehicles will not be of substantial value at this time. Plumas National Forest is large and the areas restricting motorized over the snow vehicles is sufficient for my needs. I see a very limited use of these areas by non-motorized users to justify creating animosity between these special interest groups. I find skiing into an area like Bucks Lake is generally a friendly encounter between these groups and I wish that to be the status quo." (Comment 98-1)

"The proposed limits to crossing the PCT are unjustified as there are no documented use of PCT in normal winters." (Comment 130-1)

Equity in Decision Making

"In most forest service lands it is well documented that about 95% of users are non-motorized recreationalists, while only 5% are OSV recreationists. So, one is forced to ask the outrageous question below: Why are the needs of 95% of the winter users being sacrificed for the needs of 5% of users, especially in relation to the use of the prime winter lands?" (Comment 37-3)

"we do not believe that a small minority of citizens should dictate the use for back areas of the forest that very few cross-country athletes can even reach. We hope the USFS will apply "the greatest good for the greatest number" philosophy when making the final decision. We urge you to Take No Action." (Comment 87-2)

“Through the meeting I attended in Sierra City, Ca., it became very apparent that you have responded to the requests or wishes of an elite few. While outwardly this may seem like a noble gesture, it does not follow your own guidelines or scientific approach to a matter such as this.” (Comment 84-3)

“The OSV Community is a huge supporter of the local community, supports X/C Skiers recreation, and involved with the taxpayer owned Plumas National Forest. In return the OSV Community is facing senseless, complicated rules and restrictions' with high costs of enforcement.” (Comment 127-31)

““STOP” supporting “Special Interests Groups” that give nothing back to these communities. Stand up for what is right and help these family owned businesses and other businesses make a living.” (Comment 138-2)

“We seek a fair balance of motorized and nonmotorized winter recreation opportunity, taking into account all relevant factors, including levels of user demand, user trends, relative impacts, and economic benefit to local communities.” (Comment 142-30)

OSV Recreation and a Sense of Freedom

“I respectfully request that ALL 'areas' within the PNF at least remain status quo, free of unnecessary and limiting designations.” (Comment # 19-2)

“national forests are owned by the public and should have public access, whether its people on snowmobiles or hikers or skiers. It is discrimination to close off areas to snowmobilers for no reason.” (Comment #16-7)

“I ask you please think about the economy of these little towns, the people who are going to lose so much such as; family owned businesses that may have to close, businesses not bringing in revenue and residents not being able to enjoy the freedom of the outdoors.” (Comment 138-2)

Social Bonding

“One of the reasons I moved my family to Plumas County was to be able to snowmobile during the winter months and raise my family in this area teaching them how to snowmobile and show them the great outdoors. I object to restricting or closing additional riding areas.” (Comment 3-3)

“La Porte is a special place to me and many others. We have an established community of snowmobilers that make it unique.” (Comment 85-1)

“Please do not interfere with the positive environment that I grew up in and that I am raising my family to enjoy. Snowmobiling is great for the family.” (Comment 112-1)

“My family and I have a cabin in La Porte and we have been snowmobiling for years. It's a fun activity to do with family and friends.” (Comment 125-2)

Local Economic Development

“The Sierra City economy would literally tank if we lost our OSV friends. Many of our vacation homeowners buy here because of Yuba Pass and Lakes Basin OSV trails. The real estate industry, restaurant industry, grocery store, and other hospitality businesses would have to shut down during the winter if not for the income these users bring to the area.” (Comment 87-1)

“In order to provide a more balanced spectrum of winter recreation opportunities, diversify our local recreation economy, and perpetuate skiing in Plumas County, I urge the Plumas National Forest consider the additions to OSV Prohibited Areas.” (Comment 152-14)

“due to the State's OSV program, they are heavily used by snowmobiles. In many cases, where snowmobile use is heavy, skiers have been largely displaced from such roads. In other areas, growth of ski tourism has been discouraged because of the OSV presence. This is not a fair balance, and it is not economically-sound policy for gateway communities.” (Comment 142-26)

“The proposed restrictions will reduce the quantity of visiting snowmobilers decreasing revenues for an already economically challenged county which relies heavily on recreating visitors for income.” (Comment 81-3)

“OSV brings economic stability to our towns and cities. It supports lodging, stores, restaurant and gas stations. Without income for them then, the town may die as they need the winter income.” (Comment 132-2)

Quiet Recreation

“OSVs are incompatible with my goals. They are noisy, smelly, tear up the snow and dangerous. 40 mph missiles are incompatible with muscle powered travel. OSVs are so dangerous and obnoxious that I and most other skiers, snowshoers and snowboarders just don't go where they operate.” (Comment 39-2)

“the noise, air quality, viewshed, and other impacts associated with OSV use can greatly diminish the experience of non-motorized users.” (Comment 92-44)

“I applaud the effort to officially designate OSVs. Not only is it important to provide areas for non-fossil fuel powered recreation (quiet rec) but it is important that non-motorized areas are provided for wildlife during the winter months.” (Comment 168-1)

“PCT users' experience can be significantly impaired if, along the trail in between protected areas, they encounter harshly clashing land uses, such as motorized use right along the trail. This is why the landscape adjacent to the PCT should be managed in a way that protects the trail experience year round for PCT users.” (Comment 181-5)

Natural Resource Conditions

“OSV use during spring conditions, over routes that are part mud and part snow, is particularly destructive and should be prohibited. We recommend wet weather and/or seasonal route closures be considered as a tool to avoid and minimize adverse impacts of motorized use on native surface roads and related erosion, sedimentation, and water quality effects.” (Comment 13-9)

“I believe there is nothing fundamentally wrong with OSV use in my opinion, but want to make sure the usage considers all users, not just one group. Plenty of FS resources go to groomed trails, signage and general maintenance and outreach for OSV. I think OSV like all compatible recreation access should be based on a sense of balance with the resources given consideration first.” (Comment 44-5)

Safety

“The deep tracks of snowmobile can also create a hazard when skiing down a slope, or quickly "track out" a slope, rendering it un-skiable. Safety is also a concern as there is the possibility of collision with a snowmobile, or a risk of a snowmobile triggering an avalanche from above.” (Comment 142-2)

Environmental Justice

Factors considered in identifying communities who would be considered in respect to environmental justice concerns are presented in table 86. Potential avenues for adverse risks to minority or low income populations that may result from the implementation of the project would be from economic impacts that may disproportionately affect jobs and income, as these communities may be more sensitive to change or less resilient to respond to changes in the job market.

Counties within the analysis area are for the most part less racially and ethnically diverse than comparative California counties. Relative to the counties in the analysis area, Lassen County is the most racially diverse with 20.3 percent of the population identifying as a race other than ‘white alone’, which exceeds the share of non-metro counties by two percent. Additionally, 18.4 percent of the people in Lassen County identified as Hispanic or Latino, which is the greatest share in the analysis area; however, less than that of other non-metro counties. The largest population by race outside of White Alone is Black or African American Alone at 8.9 percent, which is more than four times the share of this racial group represented at the non-metro county level.

The relatively high portion of Black or African American and Hispanic or Latino populations is likely due to the presence of the High Desert State Prison and the California Correctional Center both located in Susanville. Prison populations are disproportionately skewed toward minority populations. Department of Justice research finds that one of every three African Americans born today can expect to go to prison in his lifetime, as can one of every six Latino males (Mauer 2011). A spatial analysis of census data at the census tract level revealed that the census tract where the two prisons occur has a 22 percent population of Black or African American.

Susanville’s economy is largely based on prison industries and government, health industries and gaming. The top 10 largest employers in Susanville include the two prisons, the County, Susanville Indian Rancheria, Lassen College, Banner Lassen Medical Center, Diamond Mountain Casino, Walmart and the Susanville School District.

Table 86. Environmental justice characteristics by county

Location	Poverty Rate ²⁷	Share Other than White Alone	Hispanic or Latino (of any race)
Butte County	21.3%	16.9%	15.4%
Lassen County	16.2%	20.3%	18.4%
Nevada County	12.1%	7.8%	9.1%
Plumas County	12.8%	10.4%	8.4%
Sierra County	11.3%	4.2%	10.4%
California Metro*	15.9%	39.8%	39.2%
California Non-Metro	14.5%	18.2%	25.3%

Source: U.S. Census Bureau 2017, ACS 2016 5-year estimate

²⁷ “Following the Office of Management and Budget’s (OMB) Statistical Policy Directive 14, the Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family’s total income is less than the family’s threshold, then that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using Consumer Price Index (CPI-U). The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps)” (U.S. Census Bureau 2015a).

Butte and Lassen Counties exceeded comparative non-metro California counties in respect to poverty levels, however, it is only considered “meaningfully greater” to define this as an environmental justice community should the difference be greater than 10 percent.

Census tract level GIS analysis was employed to identify specific low-income communities, displayed in table 87 and defined as where 50 percent or more of the population is considered in poverty, or where the proportion of low-income communities are “meaningfully greater” than their comparative county counterparts. For this analysis, low-income communities would also be identified by those which exceeded a 10 percent difference than their comparative counterpart. For example, poverty rates for a census tract in Butte County would be compared to poverty rates of metro California counties and would need to exceed this rate by 10 percent, meaning that census tracts in Butte County exceeding 25.9 percent poverty are considered as low-income communities for the purposes of the environmental justice analysis.

Stirling City is a census-designated place located in the western foothills of the Sierra Nevada Mountains. It lies at an elevation of 3,570 feet. The Stirling City economy is largely based on agricultural production related to timber harvest, fruit and tree nut harvests (Wikipedia 2018).

Oroville, the largest community of the area lies at 164 feet elevation. The top ten employers in Oroville include the County of Butte, Oroville Hospital, Pacific Coast Producers, Graphic Packaging International, Walmart Stores, Ammunition Accessories, Home Depot USA, Roplast Industries, the City of Oroville and Currier Square Spe LLC. Tourism is largely associated with water based recreational activities at Lake Oroville and along the Feather River (Wikipedia 2018c). Thermalito is a census-designated place that lies at 225 feet elevation just west of Oroville and is generally considered part of Oroville (Wikipedia 2018d). Palermo is situated at an elevation of 194 feet. Its history is in mining and agricultural production related to olives and oranges given its Mediterranean climate (Wikipedia 2018b).

Table 87. Low-income communities

County	Census Tract (2010 boundaries)	Geographic Community	Total Population	Percent Below Poverty
Butte	003700, 003002, 003001, 003200, 002900, 002800	Oroville, South Oroville, Palermo, Thermalito	22,525	33.7%
Butte	000603, 001300, 001200, 001100, 001000, 000604, 000300	Chico	26,304	43.3%
Butte	001704	Sterling City	3,201	27.5%
Nevada	000600	Grass Valley	6,591	28.1%
Lassen	040303, 040304	Susanville	4,093	30.9%
California Metro	-	-		15.9%
California Non-Metro	-	-		14.5%

Grass Valley, located to the south of the Plumas National Forest, lies at 2,411 feet elevation. Grass Valley and its neighboring community of Nevada City have a relatively diversified economy. Tourism related to the gold rush era and the related services sector are important sectors of the local economy. The average total snowfall annually is 10 inches (Wikipedia 2018e). Tourism related to outdoor activities in Grass Valley is largely based spring, summer and fall activities and not snow-dependent activities, such as cross-country skiing or OSV use. Outdoor recreation activities promoted by the City of Grass Valley via

links on the City website include hiking, trails for strollers, mountain biking, rock climbing, rafting, fishing, kayaking, sailing, and horseback riding (Basecamp 2018).

Given the presence of communities that qualify as low-income communities, the environmental consequences analysis will address the potential for management actions to disproportionately and adversely affect low-income communities. Low-income communities may be less able to adapt to changes in employment and income.

Environmental Consequences

Effects common to all alternatives

Environmental Justice

Communities identified in the affected environment section that should be considered in respect to potential environmental justice concerns include minorities, specifically African American and Latino communities in Susanville, and low-income communities identified in table 87. Given that this project's effects are largely limited to changes in the management of dispersed winter recreation, potential effects in regards to adverse risk that may be created by the project would be due to loss of jobs and income earning opportunities in industries either directly or indirectly supported through dispersed winter recreation visitation in the Plumas National Forest.

To consider potential effects to jobs and income to minority and low-income communities in Susanville, it is important to consider the economic composition of the community and the relative importance and influence of the expenditures due to winter visitation to the Plumas National Forest for OSV and cross-country skiing opportunities. As described in the affected environment section, Susanville's largest employers include prison industries, gaming, government, healthcare industries, and the retailer, Walmart. Outdoor recreation and tourism do not play a sizeable role in the economic make-up of Susanville, nor is this project expected to affect risk to prison populations in Susanville. Therefore this project is not expected to directly affect or distribute disproportionate adverse risk to minority communities in the analysis area.

In respect to low-income communities, it is important to consider the economic composition of the communities and the relative importance and influence of the expenditures due to winter visitation to the Plumas National Forest for OSV and cross-country skiing opportunities. As described in the affected environment section, the communities of Oroville, South Oroville, Palmero, Thermalito, and Chico all occur well below 5,000 feet elevation. While Stirling City and Grass Valley are situated higher in the Sierra Nevada foothills, these communities do not have reliably predictable snowfall and therefore are unlikely destinations for OSV or cross-country ski visitation. Further investigation found that the industry of primary importance to Stirling City is agriculture. While Grass Valley does have a robust tourism industry it is largely rooted focused cultural tourism related to the town's mining history and outdoor recreation primarily occurs from spring through the fall. Given the geographic context of these low elevation communities and their economic composition, it is unlikely that the project would directly affect the jobs and income for low-income communities in these towns.

In addition, the total contribution to jobs and income across the five county analysis area is negligible considering the size of the five-county analysis area economy, and therefore is not expected to result in indirect adverse effects to minority or low-income communities. Therefore this project is not expected to directly or indirectly result in disproportionate adverse risk to minority communities in the analysis area.

Effects common to all action alternatives

Quality of Life

Regardless of the alternative selected, public comments revealed that generally people who advocate for OSV use do not believe there is a need to designate OSV in the forest. They do not feel there is a need to minimize natural resource impacts, or improve winter recreation opportunities or reduce user conflict related to OSV use. Designation of OSV under any action alternative would likely be viewed unfavorably by OSV recreationists, which may influence behaviors that demonstrate unfavorable attitudes.

Conversely, commenters who identified values related to quiet recreation demonstrated their support for designating where OSV use is allowed and believe this process has the potential to improve natural resource conditions, improve quiet recreation opportunities, and reduce user conflict related to winter dispersed recreation. Designation of OSV under any action alternative would likely be viewed favorably by people who prefer non-motorized recreation, which may influence behaviors that demonstrate favorable attitudes.

OSV designation may create polarizing attitudes among the diverse recreation communities, however, all the alternatives include measures to reduce the potential for user conflict to adversely affect quality of life. To minimize and mitigate the conflicts between motor vehicle use and existing or proposed recreational uses on the seven discrete OSV area designations, the following measures will be taken. This list is not all encompassing; see the appendices for a full list of minimization measures.

1. Plumas National Forest and Plumas County would cooperate to temporarily close designated, groomed trails to use by wheeled vehicles.
2. Class 2 OSVs would be allowed to operate on designated groomed trails only. Class 2 OSVs would not be allowed to operate cross-country or on ungroomed trails.
3. The Forest Service would provide signage and electronic information to educate the public on responsible practices and use restrictions for Class 2 OSVs.
4. To accommodate current use patterns and reduce potential conflicts between motorized and nonmotorized recreation areas, the areas west, south and east that are adjacent to the Plumas-Eureka State Park would not be designated for OSV use.
5. The upper (south) portion of Little Jamison Creek Basin would be designated for OSV use. The lower (north) portion of Little Jamison Creek would not be designated for OSV use. This area overlaps a reach of river proposed as Wild under the Wild and Scenic River Act and receives little OSV use.

Cumulative Effects

Economic Activity

The distribution of economic effects of the project across the regions in the Plumas National Forest may be influenced in part by the distribution of recreation opportunities. As noted previously, recreation participation is influenced by numerous factors, quantity of recreation opportunities being one (White and Bowker et al. 2014). Other factors may also influence the distribution of economic effects that are beyond the control of the Plumas National Forest. Capacity of business owners, local and county governments to market changes in recreation opportunities, identify business opportunities to grow clientele, and make strategic business investments to sustain or expand their market share of winter snow-dependent

recreationists. How individual businesses and communities respond to changes in the factors influencing recreation participation is unknown.

Alternative 1 – No Action

The no-action alternative is required by the National Environmental Policy Act and serves as a baseline to compare effects of action alternatives. This alternative would continue current management and would not affect OSV use in the project area.

Table 88. Socioeconomic resource indicators and measures for alternative 1 direct and indirect effects

Resource Element	Resource Indicator (Quantify if possible)	Measure (Quantify if possible)	Alternative 1
Economic activity	Employment, income, tax revenue	Total Jobs ~ 9.6 Snowmobiling ~3.8 Cross-countryskiing ~ 5.8 Total Labor Income ~\$326,434 Snowmobiling ~ \$127,963 Cross-countrySkiing~ \$198,471	No effect
Quality of life	Recreation Quality	Per Capita Designations (2028) Snowmobiling ~ 0.76 acre/person; 0.0005 mile of snow trails (available for grooming) Cross-countrySkiing~ 0.03 acre/person	No effect
Quality of life	Values, beliefs, and attitudes	See discussion on qualitative evaluation of public values, beliefs, and attitudes.	No effect
Environmental Justice	Low-income and minority populations	Change in the distribution of risk to economic well-being and cultural resources.	No effect

Direct and Indirect Effects – Alternative 1

Economic Activity

Alternative 1 would maintain the same amount of high-quality OSV-use areas as is currently allowed at 305,629 acres. Alternative 1 would maintain the existing 227 miles of designated trails with 203 miles available for groomed snow trails on NFS lands. Alternative 1 proposes no trails for grooming. As stated in the assumptions, OSV visitor use is influenced by the miles of groomed trails and the amount of high-quality OSV areas.

Alternative 1 would designate 12,956 acres for non-motorized winter recreation opportunities within 5 miles of plowed trailheads and warming huts. As stated in the assumptions, non-motorized winter recreation visitation is assumed to be proportionate to the amount of highly desirable non-motorized recreation opportunity.

Alternative 1 would result in 9.6 total jobs across the five-county analysis area and \$326,434 in labor income across the analysis area from recreation expenditures related to OSV and non-motorized winter recreation. OSV related expenditures account for 3.8 jobs and \$127,963 in labor income, while non-motorized winter recreation accounts for 5.8 jobs and \$198,471 in labor income. Alternative 1 is not anticipated to affect jobs and income in the analysis area.

When considering the distribution of effects across communities within and adjacent to the Plumas National Forest the amount of change from the existing condition is considered in two respects. The

percent reduction in areas open to OSV use that are over 3,500 feet in elevation, and the percent reduction in the amount of high-quality OSV areas over 5,000 feet in elevation. Under alternative 1, there would be no change, and therefore, no distributional effects by area.

Quality of Life

The NVUM figures from 2015 suggest the overall visitation to the Plumas National Forest has declined since 2010. Data from the State on OSV registration from 2009 to 2018, suggest that the rate of participation of OSV use may be increasing in recent years. Changes in recreation participation may be due to the changes in the nation's economy and changes in annual weather patterns. Such changes are outside the control of the agency.

One factor that may influence recreation participation related to this project is the amount of recreation opportunity per capita measure by acres per person or miles of trail per person. Assuming a five percent growth in the population by 2028, there would be 0.76 acre per person for OSV use and 0.00005 mile of groomed snow trail per person. For highly desirable non-motorized recreation, there would be 0.03 acre per person under the no-action alternative. Per capita measures give a sense of the level of change in crowding that would influence the quality of the recreation experience.

The values, beliefs, and attitudes discussion above identified several key issues related to OSV use in the Plumas National Forest and how people's perceptions of their quality of life may be influenced. In particular, commenters discussed recreation opportunities and user conflict. The no-action alternative would not change recreation opportunities, patterns or user conflict.

As noted in the recreation report, conflicts between motorized and non-motorized uses are largely reported by people who prefer non-motorized recreation experiences due to impacts related to air quality, safety, and the quiet recreation experience. This is not unusual, user conflict is often experienced differently by different user groups. This is because motorized use may disrupt quiet recreation opportunities non-motorized users may prefer, however, the reverse is not true. Therefore, the potential for user conflict may particularly affect quality of life for non-motorized winter recreation users. Conflict among uses would persist without mitigation especially near trailheads where congestion is at its greatest.

Environmental Justice

Alternative 1 is not expected to disproportionately distribute adverse risk to low-income or minority communities. The discussion under "effects common to all alternatives" provides information on the considerations and rationale supporting this determination.

Cumulative Effects

Cumulative effects result when the direct or indirect effects of the project overlap in time and space with the effects of the past, present, and reasonably foreseeable future projects. Alternative 1, the no-action alternative, is not expected to result in a change to recreational visitor use. As a result, recreation-related employment, labor income, and tax revenue would not change due to this alternative. Alternative 1 is not expected to result in direct or indirect effects to the quality of life and related attitudes, values, and beliefs, nor is it expected to result in effects to environmental justice communities.

Given that there are no direct or indirect effects of alternative 1, there would be no cumulative effects of alternative 1. However, since neighboring national forests are designating OSV travel on National Forest System Lands, the affected environment could change in the future, given a change in management by neighboring forests.

Given that the designation of OSV trails and areas is part of a Forest Service wide process to comply with subpart C of the Travel Management Rule, other national forests within the economic analysis area, including the Lassen and Tahoe National Forests, are also required to complete OSV designation. Should alternative 1 be implemented in the context of all other national forests designating trails and areas open to OSV, the Plumas may have higher visitation rates than what has been experienced in the past. When visitors to the Tahoe and Lassen National Forests were asked how they would respond if their primary recreation activity was not available, 59.8 percent and 35.9 percent respectively indicated they would travel elsewhere for the same activity (USDA Forest Service 2015b, USDA Forest Service 2015c). While the Tahoe and Lassen National Forests would continue to offer OSV recreation opportunities, it is apparent when viewing comments submitted from the public in response to OSV designation that some people *believe* that OSV opportunities are being eliminated. Such beliefs may influence subsequent behaviors to visit the Plumas rather than other national forests that have undergone OSV designation. Therefore, the cumulative effects of doing nothing, alternative 1, would provide a positive economic benefit to communities reliant in part on OSV-related visitor spending.

The no-action alternative may influence substitution behavior of visitors of other national forests related to OSV use. The magnitude of this effect (e.g., influencing substitution behavior) would likely extend beyond the cumulative effects analysis area attracting OSV recreationists outside the analysis area. Should such a magnitude of change in visitation patterns occur, it is likely that the intensity of the effects would be moderate on the economic activity and quality of life. Such an increase in visitation would likely lead to positive moderate economic effect, as spending patterns associated with OSV use is relatively high compared to other forest activities. On the other hand, such an increase in OSV use in the Plumas would potentially lead to overcrowding, resulting in increased safety hazards related to collisions and decreased opportunities for quiet non-motorized recreation.

Alternative 2 - Modified

Alternative 2 is the modified proposed action. Alternative 2 - modified would designate trails and areas for public OSV use as well as areas where OSV use is not allowed in the Plumas National Forest.

Direct and Indirect Effects - Alternative 2 - Modified

Economic Activity

The modified proposed action would decrease the acres of highly desirable OSV areas by 7.4 percent from existing conditions to 282,915 acres, and would designate 304 miles of snow trails on NFS lands. With 204 miles of snow trails available for grooming, alternative 2 - modified is equivalent to current conditions for groomed trails. As stated in the assumptions, OSV visitation is influenced, in part, by the miles of groomed OSV trail opportunity and the amount of land available for cross-country OSV use that is considered high-quality OSV areas.

Acres of land designated for non-motorized OSV within 5 miles of plowed trailheads and warming huts, referred to as highly desirable non-motored recreation opportunity, is 35,778 acres, representing a 276 percent increase from the no-action alternative. As stated in the assumptions, changes in non-motorized winter recreation visitation would be one factor affecting a change in the amount of highly desirable non-motorized recreation opportunity.

Overall, alternative 2 - modified would result in \$354,249 in labor income and 10.4 jobs. Given the 7.4 percent decrease in high-quality OSV areas and no net change in the miles of snow trails available for grooming, economic contributions from OSV would decline by \$521 in labor income and 0.04 job, a negligible effect. The 273 percent increase in highly desirable non-motorized recreation opportunity

would increase economic contributions from cross-country ski visitation by \$28,336 labor income and 0.8 job, a slight beneficial effect. Overall, alternative 2 - modified would result in a net increase from the no-action alternative in labor income by \$27,815 and 0.8 job in the analysis area.

The Plumas National Forest recreation contribution to jobs and income in the analysis was 188 jobs and 6.4 million in labor income (2014). Alternative 2 - modified would increase recreation contributions by less than 0.5 percent. Furthermore, when viewed in context to the overall forest contribution to jobs (1,630) and labor income (\$67.3 million), the economic impact would be even further diminished as an economic contribution. Alternative 2 - modified would, therefore, have negligible beneficial effect on jobs and labor income in the analysis area.

When considering the distribution of effects across communities within and adjacent to the Plumas National Forest the change from the existing condition is considered in two respects. One, the relative reduction in areas designated for OSV use that are over 3,500 feet in elevation, and two, the relative reduction in the amount of high-quality OSV areas over 5,000 feet in elevation. Figure 24 shows the percent change from existing condition by region for these two categories.

Under alternative 2 - modified, the greatest reduction in areas where OSV is allowed is in the Buck's region, which would be reduced by 44 percent. The reduction in high-quality OSV areas above 5,000 feet elevation in this region, however, is only five percent. Therefore the large majority of the reduction in OSV cross-country opportunity is within 3,500 to 5,000 feet elevation. The quantity of recreation opportunities that are more consistently and reliably available over 5,000 feet elevation would be nominally affected. In areas below 5,000 feet elevation, which does not provide reliable annual snowpack would be reduced by 39 percent.

The miles of groomed OSV trail opportunities in the Bucks region, however, would increase slightly. Groomed trail opportunities are one of the most popular OSV recreation opportunities. Maintaining groomed trail opportunities that attract recreationists and spur tourism would mitigate potential risk to businesses catering to clientele who enjoy OSV recreation. Alternative 2 - modified also designates OSV areas with connectivity to adjacent private lands in mind to help facilitate cross-country OSV travel across the both Federal and private lands.

Recreation and tourism-dependent businesses in this region may be more sensitive to changes to changes in other factors influencing recreation participation, such as annual precipitation, demographic changes, and national economic trends. Other regions that may experience increased economic risk include LaPorte and Lakes Basin that would have reductions in OSV allowable areas of 38 percent and 28 percent, respectively. High-quality OSV recreation opportunities over 5,000 feet elevation would be reduced by 25 percent for Lakes Basin and 19 percent for LaPorte.

For Lakes Basin, alternative 2 - modified would provide for connectivity to the Tahoe National Forest OSV recreation opportunities. Connectivity by county and Forest Service roads designated for OSV use provide access to the cross-country OSV and motorized trail opportunities in the LaPorte region.

While there would a reduction in cross-country OSV opportunities, the great majority of the reduction would be in lands below 5,000 feet, while the great majority of high-quality OSV opportunities would be maintained. Designating open areas and trails strategically to provide for connectivity among OSV motorized trail networks and areas open to cross-country OSV would mitigate risks to businesses cater to people attracted to the area for OSV recreation opportunities.

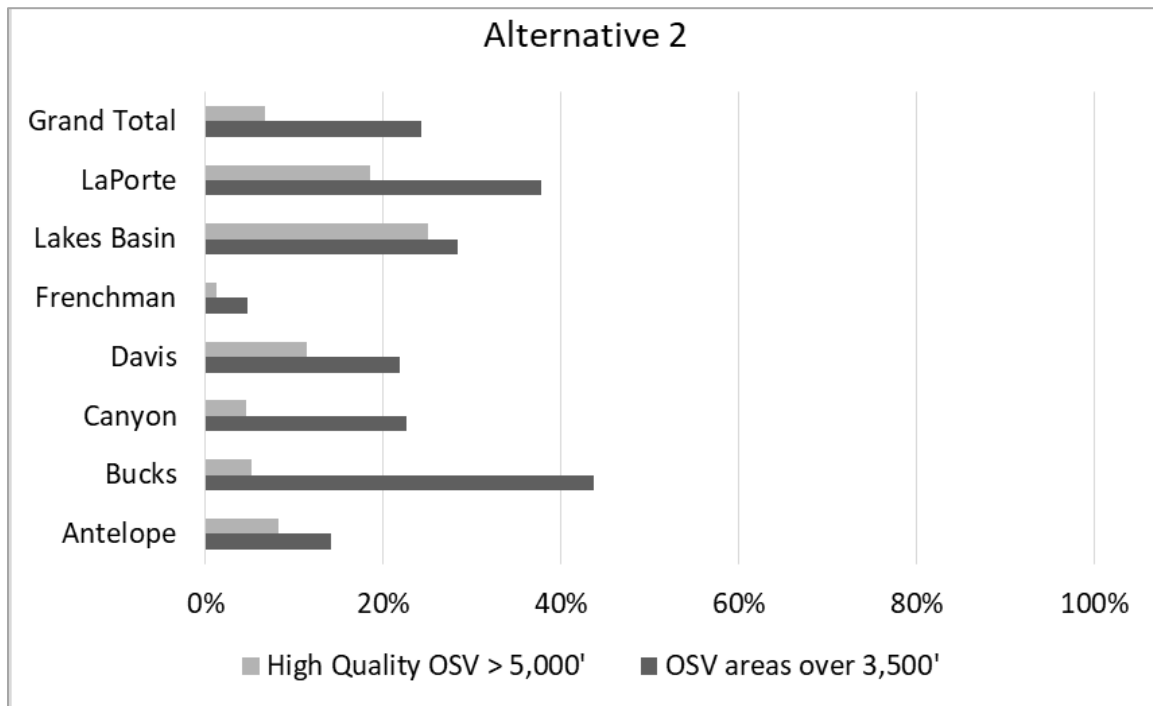


Figure 24. Change in OSV opportunities by region, alternative 2 - modified

Quality of Life

The values, beliefs, and attitudes discussion above identified several key issues related to OSV use in the Plumas National Forest and quality of life for visitors and area residents. In particular, commenters discussed their values related recreation opportunities, safety, user conflict, economic concerns and the values they believe should be weighed in a fair decision-making process.

Alternative 2 - modified would designate 281,874 acres of high-quality OSV areas as designated for OSV use. This would be a slight reduction compared to existing conditions which allows for approximately 305,629 acres. Alternative 2 - modified would increase OSV snow trails available for grooming by 1 mile. Assuming a 5 percent growth in the population by 2028, there would be 0.70 acre per person for OSV use and 0.00005 mile of snow trail available for grooming per person, which would represent a change from the no action alternative by 0.11 acre per person for OSV use and no change in the miles of snow trails available for grooming per person. The change in per capita recreation opportunity gives a sense of how the quality of the recreation experience may be impacted through crowding or over use. A 0.11-acre change is relatively small and would likely have no noticeable effect. Although alternative 2 - modified is unlikely to result in a noticeable decline in recreation quality, OSV recreationists may feel they are adversely affected by the overall reduction in land area available for OSV use, which may lend to beliefs that their quality of the life is diminished.

Alternative 2 - modified would provide for 34,700 acres of land within 5 miles of plowed trailheads and warming huts where OSV use is not allowed. This represents an increase of over 2.5 times the amount of land currently available for high-quality non-motorized winter recreation. Assuming a 5 percent growth in the population by 2028, there would be 0.09 acre of highly desirable non-motorized recreation opportunity per person under alternative 2 - modified. Per capita measures give a sense of the level of change in crowding that would influence the quality of the recreation experience. Alternative 2 - modified

provides three times the area per capita as alternative 1; however, the change is still relatively small, given the small acreage per person to begin with. It is likely that the increase in acreage may result in a noticeable benefit for non-motorized recreationist who would likely encounter fewer people and have areas designated for non-motorized activity. This may lend to a greater sense of opportunity related to quiet recreation values and result in beliefs that their quality of life is improved, as compared to alternative 1.

Alternative 2 - modified would designate 1,940 acres within 0.25 mile of wilderness areas for OSV use; this represents an overall reduction in lands designated within close proximity to wilderness areas by over half. Should alternative 2 - modified be selected, wilderness areas characteristics related to quiet recreation, such as solitude, would be benefitted, and reduce risks to such values compared to alternative 1 or alternative 4. This is likely to reduce potential use conflicts to non-motorized users near and within wilderness areas. Use conflict is often experienced most acutely by non-motorized winter recreationists since noise from OSVs adversely affects quiet recreation.

Alternative 2 - modified would require 12 inches of snowpack for OSV cross-country travel and on groomed trails, while only 6 inches would be required on ungroomed designated trails. The snowpack requirement may provide some measure of assurance for people who are concerned about the impacts of OSV use to soil, plant, and water quality more so than alternative 4, however, less so than alternatives 3 and 5.

Alternative 2 - modified would designate 16 OSV crossing points on the PCT. While this would limit the number of crossings in respect to the no-action alternative, it may alleviate concerns expressed by non-motorized users related to preserving the non-motorized recreation experience for which the PCT was designated. Compared to alternative 3, alternative 2 - modified would have 7 more crossings, which would provide for a greater sense of freedom for OSV cross-country travel on both sides of the PCT. Some of these proposed OSV crossings are wider than the width of a road because they are located in areas where snow conditions are highly variable during the course of a winter, for example areas prone to wind loading of snow and formation of cornices. These wider crossings give OSV recreationists options to select a safe crossing of the trail under constantly changing, variable snow loading conditions. In all cases, OSVs crossing the PCT would do so at 90 degrees to minimize the time and distance needed to cross the trail.

Both commenters who are in favor of designation of OSV areas and those who are not, demonstrated beliefs in their comments that each perspective (motorized and non-motorized recreationists) represented the majority of the public and that the majority should weigh substantially in the decision-making process. Alternative 2 - modified would demonstrate a balanced consideration of the diversity of interests and perspectives more so than the other action alternatives. If alternative 2 - modified is selected, both commenters who value non-motorized winter recreation and those that value motorized recreation may feel that their voices were heard and concerns addressed to a limited extent, and are more likely to feel that the decision-making process reasonably considered and reflected the breadth of concerns and perspectives.

Environmental Justice

Alternative 2 - modified is not expected to create or disproportionately distribute risk to low-income or minority communities related to the Plumas National Forest. The discussion under effects common to all alternatives provides information on the considerations and rationale supporting this determination.

Cumulative Effects – Alternative 2 - Modified

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Past, present, and reasonably foreseeable projects in the planning area include vegetation management, livestock grazing, and prescribed burns. These actions have the potential to temporarily restrict or displace recreation use. However, none of the actions are expected to measurably affect annual recreation use, visitor spending, and associated employment, labor income, and tax revenue associated with winter dispersed recreation. Therefore, no cumulative effects related to economic activity are anticipated. The temporary displacement of recreation use may affect quality of life if preferred sites are temporarily unavailable. However, such effects are expected to be infrequent and minor. Temporary displacement is not expected to increase conflict between motorized and non-motorized recreation users. Finally, these past, present, and reasonably foreseeable actions may affect travel costs if visitors must travel farther because preferred recreation sites are temporarily unavailable. However, since displacement would be infrequent and minor, effects to travel costs are not expected to meaningfully add to the potential environmental justice effects described in the direct and indirect effects analysis.

Table 89. Socioeconomic resource indicators and measures for alternative 2 - modified direct and indirect effects

Resource Element	Resource Indicator (Quantify if possible)	Measure (Quantify if possible)	Alternative 2 - Modified
Economic activity	Employment, income, tax revenue	Total Jobs ~ 10.4 Snowmobiling~3.8 Cross-countryskiing~6.7 Total Labor Income~\$354,186 Snowmobiling ~ \$127,379 Cross-country Skiing~ \$226,807	Direct/Indirect Effect Negligible beneficial effect Cumulative Effect No effect
Quality of life	Recreation Quality	Per Capita Designations (2028) Snowmobiling ~ 0.70 acre/person; 0.0005 mile of snow trails (available for grooming) Cross-country Skiing~ 0.09 acre/person	Direct/Indirect Effect Motorized Use - Negligible adverse Non-Motorized use – negligible beneficial
Quality of life	Values, beliefs, and attitudes	See discussion on qualitative evaluation of public values, beliefs, and attitudes.	Direct/Indirect Effect Motorized Use – negligible effect. Non-motorized use – minor beneficial.
Environmental Justice	Low-income and minority populations	Change in the distribution of risk to economic well-being and cultural resources.	Direct/Indirect/Cumulative No effect

As presented in the affected environment, OSV registration was declining from 2009 to 2014; however, it has shown an overall increase from 2015 to 2018. While some projections anticipate OSV use declining in the participation rate by 10 percent by 2030, population growth may result in the absolute number of participants continuing to increase. These changes are factors outside the control of the Forest Service and beyond the scope of this project (e.g., changing demographics, technology, climate, and recreation preferences). Such changes may influence recreation activity participation and the resultant economic contributions to employment, labor income, and tax revenue.

Given that the designation of OSV trails and areas is part of a Forest Service wide process to comply with subpart C of the Travel Management Rule, other national forests within the economic analysis area, including the Lassen and Tahoe National Forests, are also required to complete the OSV designation process. Should alternative 2 - modified be implemented in the context of all other national forests designating trails and areas open to OSV, visitation trends to the Plumas National Forest for winter dispersed recreation is expected to remain the same, as there is no other substitute option, in other words, there are no other forests within the National Forest System that offer undesignated OSV recreation opportunities that visitors might opt to visit rather than the Plumas National Forest. Therefore, visitation and related spending is expected to remain constant, or rather have no effect, when considering the Tahoe and Lassen National Forests' designation processes, should alternative 2 - modified be selected.

Alternative 3

Alternative 3 is described in detail in chapter 2. Alternative 3 was developed to address the non-motorized recreational experience significant issue.

Direct and Indirect Effects - Alternative 3

Economic Activity

Alternative 3 would decrease the acres of highly desirable OSV areas by 17 percent from existing conditions to 253,765 acres. It would also include 273 miles of designated snow trails, all of which are available for grooming, an increase in 70 miles of groomed trail OSV opportunity. As stated in the assumptions, OSV visitation is in part influenced by the amount of recreation opportunity. Relevant to this discussion is the miles of groomed OSV trail opportunity and the amount of land available for cross-country OSV use that is considered high-quality OSV areas.

Alternative 3 includes 71,146 acres of land designated for non-motorized OSV within 5 miles of plowed trailheads and warming huts, referred to as highly desirable non-motored recreation opportunity, representing a 549 percent increase from alternative 1. As stated in the assumptions, changes in amount of non-motorized winter recreation opportunity, in part, influence visitation and participation in non-motorized winter recreation activity.

Overall, alternative 3 would contribute 11.3 jobs and \$384,005 in labor income annually. Given the 17 percent decrease in high-quality OSV areas and the additional 70 miles of groomed OSV trails, economic contributions from OSV visitation would increase by 0.04 job and \$1,225 in labor income due to the increase in groomed trail opportunities. The 549 percent increase in highly desirable non-motorized recreation opportunity, would result in an increase in economic contributions, resulting in 1.7 jobs and \$56,347 in labor income. The net increase from the no-action alternative by alternative 3 in labor income is \$57,571 and 1.7 jobs in the analysis area.

The Plumas National Forest recreation contribution to jobs and income in the analysis was 188 jobs and 6.4 million in labor income (2014). Alternative 3 would increase recreation contributions by 0.9 percent; however, when viewed in context to the overall forest contribution to jobs (1,630) and labor income (\$67.3 million) the economic impact would be a negligible beneficial effect.

When considering the distribution of effects across communities within and adjacent to the Plumas National Forest, the change from the existing condition is considered in two respects. One, the relative reduction in areas designated for OSV use that are over 3,500 feet in elevation, and two, the relative reduction in the amount of high-quality OSV areas over 5,000 feet in elevation. Figure 25 shows the percent change from existing condition by region for these two categories.

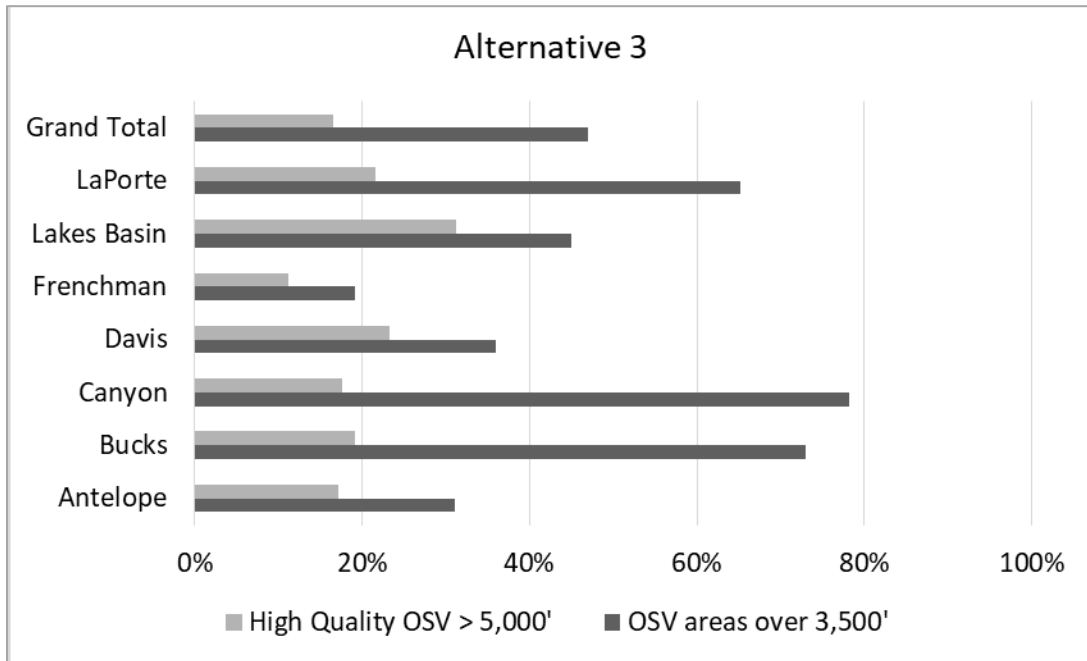


Figure 25. Change in OSV opportunity from existing condition by region

Under alternative 3, the greatest reduction in areas where OSV is allowed is in the Canyon region followed closely by the Buck and La Porte regions, which would be reduced by 78, 73, and 65 percent respectively. The reduction in high-quality OSV areas above 5,000 feet elevation in these regions, however, is 18, 19, and 22 percent. Therefore the large majority of these reductions in OSV cross-country opportunity is within 3,500 to 5,000 feet elevation.

There are no proposed groomed OSV trails in the Canyon region that would mitigate the reduction in OSV opportunities in this region. In the Bucks region, however, groomed OSV trails are proposed but would be reduced by 3.9 miles from alternative 1. The LaPorte region would maintain the existing groomed trail network. Being that groomed OSV trails are one of the most popular OSV recreation opportunities, maintaining these opportunities in these regions would help mitigate effects related to the reduction in cross-country OSV opportunities.

Alternative 3 does not afford the same level of connectivity in the Lakes Basin region among OSV recreation opportunities among the Tahoe and Plumas National Forest as alternative 2 - modified. Opportunities however to connect OSV groomed trail networks and cross-country OSV areas are provided in alternative 3, mitigating the reduction in loss of cross-country opportunity in the Lakes Basin and LaPorte regions.

Regions of the Plumas National Forest where OSV recreation opportunities, including cross-country and groomed trails, in alternative 3 would be reduced the most, Canyon, Bucks, LaPorte, and Lakes Basin may experience increased sensitivity to other changes affecting recreation participation, such as annual precipitation, demographic changes, and national economic trends. How businesses respond to capitalize on potential changes is unknown.

Quality of Life

The values, beliefs, and attitudes discussion above identified several key issues related to OSV use in the Plumas National Forest and quality of life for visitors and area residents. In particular, commenters discussed their values related recreation opportunities, safety, user conflict, economic concerns and the values they believe should be weighed in a fair decision-making process.

Alternative 3 would designate 253,765 acres of high-quality OSV areas as open to OSV use. This is a 17 percent reduction and represents the largest reduction of any of the action alternatives. In addition, alternative 3 would increase OSV snow trails available for grooming by 73 miles. Assuming a 5 percent population growth by 2028, there would be 0.60 acre per person for OSV use and 0.00007 mile of snow trail available for grooming per person. This would represent a reduction in acres per capita for OSV recreation opportunity by 0.13 acre, and a reduction of 0.0001 mile of snow trails available for grooming per person from the no-action alternative. The change in per capita recreation opportunity provides a measure of the quality of the recreation experience that may be impacted through crowding or over use. A 0.13-acre change is relatively small, and would likely have no noticeable effect. This conclusion is reinforced by predictions that the rate of OSV use will decline by 10 percent by 2030. People who value an unfettered sense of freedom by participating in cross-country OSV use may feel a loss of a sense of freedom, should alternative 3 be selected; however, others who prefer riding on groomed trails may feel that the increase in the number of groomed trails would improve the quality of their recreation experience by improving the quantity and diversity of recreation opportunities.

Alternative 3 would provide for 71,146 acres of land within 5 miles of plowed trailheads and warming huts where OSV use is not allowed. This represents an increase of over five times the amount of land currently available for high-quality non-motorized winter recreation. Assuming a 5 percent growth in the population by 2028, there would be 0.2 acre of highly desirable non-motorized recreation opportunity per person under alternative 3. Per capita measures give a sense of the level of change in crowding that would influence the quality of the recreation experience. Alternative 3 greatly expands the non-motorized recreation opportunity and reduces the per capita measure, which would lead to enhanced quiet recreation where opportunities for solitude may be expanded. It is likely that the increase in acreage may result in a noticeable benefit for non-motorized recreationist who would likely encounter fewer people and have a larger amount of land designated for non-motorized activity. Alternative 3 would provide the greatest amount of non-motorized recreation opportunity and would provide the most benefit for quiet recreation values of all the action alternatives. As a result, people who participate in non-motorized winter recreation opportunity may believe that their quality of life is improved, as compared to the no-action alternative.

Non-motorized recreationists would likely feel a great sense of opportunity related to quiet recreation values.

Under alternative 3, OSV use within inventoried roadless areas (IRAs) and within 0.25 mile of Wilderness areas would be limited to 1,985 acres, representing a 97 percent decrease in the amount of land available under alternative 1. Non-motorized users would likely feel an increased quality of life related to the decrease in the acreage designated for OSV use within IRAs, within 0.25 mile of wilderness areas and adjacent to other State lands where OSV use is not allowed.

Alternative 3 would designate up to nine OSV crossing points on the PCT. Limiting the number of crossings may alleviate concerns expressed by non-motorized users related to preserving the non-motorized recreation experience for which the PCT was designated. Motorized users who desire access to recreation on both sides of the PCT; however, may feel constrained in their options for accessing areas on different sides of the PCT, and may view this negatively as impending on their sense of freedom.

Both commenters who are in favor of designation of OSV areas and those who are not, demonstrated the belief in their comments that each group was in the majority and that the majority should weigh substantially in the decision-making process. Alternative 3 would provide the greatest benefit of all alternatives for people who value non-motorized winter recreation, such as cross-country skiing. Should alternative 3 be selected, commenters who value non-motorized winter recreation may feel that their voices were heard and concerns addressed; however, those who value OSV use may feel that their concerns were not heard and reflected in the decision, and feel that the decision-making process was unfairly influenced by a minority.

Environmental Justice

Alternative 3 is not expected to create or disproportionately distribute risk to low-income or minority communities related to the Plumas National Forest. The discussion under “effects common to all alternatives” provides information on the considerations and rationale supporting this determination.

Table 90. Socioeconomic resource indicators and measures for alternative 3 direct and indirect effects

Resource Element	Resource Indicator (Quantify if possible)	Measure (Quantify if possible)	Alternative 3
Economic activity	Employment, income, tax revenue	<u>Total Jobs ~11.3</u> Snowmobiling~3.8 Cross-countryskiing~7.5 <u>Total Labor Income~\$384,005</u> Snowmobiling ~ \$129,188 Cross-countrySkiing~ \$254,817	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect
Quality of life	Recreation Quality	<u>Per Capita Designations (2028)</u> Snowmobiling ~ 0.6 acres/person; 0.0007 mile of snow trails (available for grooming) Cross-countrySkiing~ 0.18 acre/person	<u>Direct/Indirect Effect</u> Motorized Use - Minor adverse Non-Motorized use – Minor beneficial
Quality of life	Values, beliefs, and attitudes	See discussion on qualitative evaluation of public values, beliefs, and attitudes.	<u>Direct/Indirect Effect</u> Minor adverse effect to Motorized Recreationist; Moderate beneficial effect to non-motorized recreationist. <u>Cumulative Effect</u> No Effect
Environmental Justice	Low-income and minority populations	Change in the distribution of risk to economic well-being and cultural resources.	<u>Direct/Indirect/Cumulative</u> No effect

Cumulative Effects – Alternative 3

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

The cumulative effects under alternative 3 would be similar to the cumulative effects described under alternative 2 - modified.

Alternative 4

Alternative 4 is described in detail in chapter 2. Alternative 4 was developed to address the motorized recreational experience issue.

Direct and Indirect Effects - Alternative 4

Economic Activity

Alternative 4 would increase the acres of highly desirable OSV areas by 49 acres from existing conditions to 305,768 acres. It would also include 682 miles of designated snow trails, all of which are available for grooming, an increase in 479 miles of groomed trail OSV opportunity. As stated in the assumptions, changes in amount of non-motorized winter recreation opportunity in part influence in the visitation and participation in non-motorized winter recreation activity.

Alternative 4 maintains 12,956 acres of highly desirable non-motorized recreation opportunity, representing no change from the no-action alternative for non-motorized recreation opportunity. As stated in the assumptions, changes in amount of non-motorized winter recreation opportunity, in part, influence visitation and participation in non-motorized winter recreation activity.

Overall, alternative 4 would contribute 10.1 jobs and \$343,044 in labor income annually. Given the slight increase in the amount of high-quality OSV areas open for OSV use and the additional 479 miles of groomed OSV trails, economic contributions from OSV visitation would increase by 0.5 job and \$16,610 in labor income due to the increase in groomed trail opportunities. The maintenance in highly desirable non-motorized recreation opportunity would result economic contributions consistent with the no-action alternative at 5.8 jobs and \$198,471 in labor income. The net increase from the no-action alternative by alternative 3 in labor income is \$16,610 and 0.5 job in the analysis area.

The Plumas National Forest recreation contribution to jobs and income in the analysis was 188 jobs and 6.4 million in labor income (2014). Alternative 4 would increase recreation contributions by 0.3 percent; however, when viewed in context to the overall forest contribution to jobs (1,630) and labor income (\$67.3 million), the economic impact would be a negligible beneficial effect.

When considering the distribution of effects across communities within and adjacent to the Plumas National Forest the change from the existing condition is considered in two respects. One, the relative reduction in areas designated for OSV use that are over 3,500 feet in elevation, and two, the relative reduction in the amount of high-quality OSV areas over 5,000 feet in elevation. Figure 26 shows the percent change from existing condition by region for these two categories.

Alternative 4 proposes the smallest reduction in OSV opportunities for cross-country OSV. The largest changes from the existing condition in areas open to OSV over 3,500 feet elevation would be in the Bucks region with a 25 percent reduction, and LaPorte region with a 19 percent reduction. No high-quality OSV opportunities over 5,000 feet elevation would be lost in the Bucks region, while LaPorte would decrease by 1 percent. These regions would both maintain the groomed OSV trail opportunities, one of the most popular OSV recreation opportunities. Alternative 4 also provides the greatest level of connectivity to OSV recreation opportunities among regions within the forest and to neighboring national forests.

Given that alternative 4 maintains the majority of existing cross-country OSV opportunities, including high-quality OSV opportunities, groomed trail opportunities, while providing for connectivity among OSV recreation opportunities, it is unlikely that businesses reliant primarily on OSV-related recreation

and tourism would experience increased sensitivity to changes in other factors influencing recreation participation.

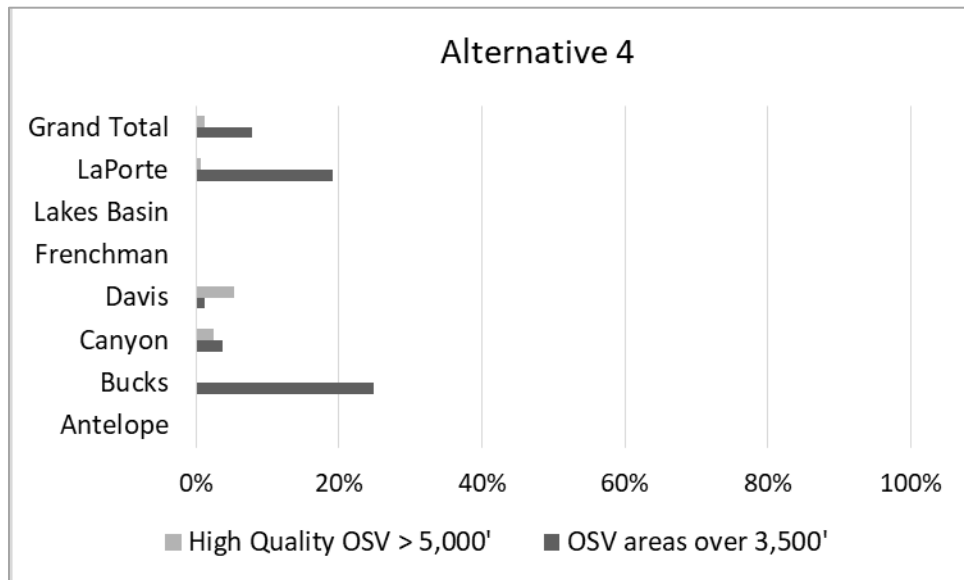


Figure 26. Alternative 4 change in OSV opportunities by region

Quality of Life

The values, beliefs, and attitudes discussion above identified several key issues related to OSV use in the Plumas National Forest and quality of life for visitors and area residents. In particular, commenters discussed their values related recreation opportunities, safety, user conflict, economic concerns and the values they believe should be weighed in a fair decision-making process.

Alternative 4 would designate 305,629 acres of high-quality OSV areas as open to OSV use. This alternative would be on par with the existing condition which allows for approximately the same amount. In addition, alternative 4 would increase the number of OSV groomed trails by 479 miles. Assuming a 5 percent population growth by 2028, there would be 0.8 acre per person for OSV use and 0.002 mile of snow trail available for grooming per person. By slightly increasing the amount of high-quality OSV areas open for OSV use, while increasing the number of groomed trails in the forest, alternative 4 would increase cross-country and groomed snow trail motorized recreation opportunity. The change in per capita recreation opportunity provides a measure of the quality of the recreation experience that may be impacted through crowding or over use. The relatively small increase in miles of snow trail per person would ensure that overcrowding would not be an issue in the future, lending toward maintaining a high-quality OSV recreation opportunity. People who value motorized winter recreation would support alternative 4, as it provides the greatest amount of cross-country OSV opportunities, while also greatly expanding the groomed snow trail network compared to the other action alternatives. Alternative 4 provides the greatest benefit of all the action alternatives in respect to enhancing the quality of the OSV recreation opportunity.

Alternative 4 would provide for 12,956 acres of land within 5 miles of plowed trailheads and warming huts where OSV use is not allowed. This is the same the amount of land currently available for high-quality non-motorized winter recreation considered in the no-action alternative. Assuming a 5 percent growth in the population by 2028, there would be 0.03 acre of highly desirable non-motorized recreation

opportunity per person under alternative 3. Per capita measures give a sense of the level of change in crowding that would influence the quality of the recreation experience. Alternative 4 would result in slightly more crowding in non-motorized areas, as participation rates for cross-country skiing are expected to remain steady and population is expected to increase, resulting in a slight increase in people per acre for non-motorized recreation. This may result in a slight or noticeable effect given the relatively small land area allotted for non-motorized recreation opportunity. Alternative 4 would provide the least amount of non-motorized recreation opportunity and as a result, people who participate in non-motorized winter recreation opportunity may believe that their quality of life has diminished, as compared to the no-action alternative.

Regarding opportunities for non-motorized recreation, alternative 4 does little to address concerns related to quiet recreation, safety, and natural resource conditions that were primary concerns for those who value non-motorized recreation. The amount of land within 5 miles of plowed trailheads and warming huts where OSV use is not allowed would be the same as the no-action alternative, 12,956 acres. People who value non-motorized winter recreation would likely feel that they have little area to explore the forest freely without being impacted by OSV noise and potential collision hazards.

Alternative 4 is similar to the no-action alternative in respect to where OSV use is allowed in inventoried roadless areas and near wilderness areas. Alternative 4 designates 64,612 acres of land within inventoried roadless areas and 4,645 acres within 0.25 mile of wilderness areas for OSV use; this represents the most land of all the action alternatives designated within close proximity to wilderness areas. Should alternative 4 be selected, wilderness areas would provide one of the few places in the Plumas National Forest for quiet recreation. The designation of allowable OSV use in close proximity to wilderness areas in alternative 4 would create the highest potential for conflict of uses among motorized and non-motorized use. The use conflict here would be likely to adversely affect the quality of life for people who value quiet recreation, as user conflict is often asymmetrical (motorized use inhibits non-motorized use, but not the reverse).

Alternative 4 would require 12 inches of snowpack for cross-country travel, limiting impacts from OSV use to areas open to OSV, and there is no snowpack requirement for trails but, generally requires sufficient snowpack to preclude resource damage. People concerned about natural resource impacts would likely continue to have concerns about impacts to soil, plant, and water quality, should alternative 4 be selected.

Alternative 4 provides for 16 OSV crossings on the PCT, which would likely abate some of the safety concerns related to collisions with motorized and non-motorized recreationists on trails relative to the no-action alternative, as well as alleviate some the concerns of OSV recreationists related to losing a sense of freedom to travel cross-country and access areas on both sides of the PCT without undue burden. However, the large amount of land designated for OSV use and the limited amount of land where OSV is not allowed would likely continue to pose safety concerns for cross-country skiers who may recreate in areas where OSV is allowed.

Overall, people who support maintaining existing OSV-use areas would likely feel that their voices had been heard, should alternative 4 be chosen. Motorized recreationists would likely support the decision, citing the importance of the economic values the OSV community provides for local communities. Conversely, people who prefer non-motorized winter recreation opportunities would likely feel that the agency had not considered their concerns and the sizable number of people affected by the decision. These people may feel that the decision unfairly favored a small segment of the public and had not balanced the interests of the non-motorized community and their values.

Environmental Justice

Alternative 4 is not expected to create or disproportionately distribute risk to low-income or minority communities related to the Plumas National Forest. The discussion under “effects common to all alternatives” provides information on the considerations and rationale supporting this determination.

Table 91. Socioeconomic resource indicators and measures for alternative 4 direct and indirect effects

Resource Element	Resource Indicator (Quantify if possible)	Measure (Quantify if possible)	Alternative 4
Economic activity	Employment, income, tax revenue	Total Jobs ~10.1 Snowmobiling ~ 4.25 Cross-country skiing ~ 5.8 Total Labor Income~ \$343,044 Snowmobiling ~ \$144,573 Cross-country Skiing ~ \$198,471	Direct/Indirect Effect Negligible beneficial effect Cumulative Effect No effect
Quality of life	Recreation Quality	Per Capita Designations (2028) Snowmobiling ~ 0.8 acre/person; 0.002 mile of snow trails (available for grooming) Cross-country Skiing ~ 0.03 acre/person	Direct/Indirect Effect Motorized Use - Minor beneficial Non-Motorized use – No effect
Quality of life	Values, beliefs, and attitudes	See discussion on qualitative evaluation of public values, beliefs, and attitudes.	Direct/Indirect Moderate benefit to Motorized Recreationist Minor adverse effect to non-motorized recreationist.
Environmental Justice	Low-income and minority populations	Change in the distribution of risk to economic well-being and cultural resources.	Direct/Indirect/Cumulative No effect

Cumulative Effects – Alternative 4

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

The cumulative effects under alternative 4 would be similar to the cumulative effects described under alternative 2 - modified.

Alternative 5

Alternative 5 is described in detail in chapter 2. Alternative 5 was developed to address protections for wildlife and natural resources, as well as, quality recreational experiences for non-motorized recreation.

Direct and Indirect Effects - Alternative 5

Economic Activity

Alternative 5 would have similar overall effects to economic activity described under alternative 3.

When considering the distribution of effects across communities within and adjacent to the Plumas National Forest, the change from the existing condition is considered in two respects. One, the relative reduction in areas designated for OSV use that are over 3,500 feet in elevation, and two, the relative reduction in the amount of high-quality OSV areas over 5,000 feet in elevation. Figure 27 shows the percent change from existing condition by region for these two categories.

Alternative 5 further reduces the quantity of cross-country OSV opportunities; however, similar to alternative 3, maintains groomed OSV trail opportunities, less 3.9 miles in the Bucks region. Potential risks and benefits-related business activity would be distributed similar to alternative 3; however, alternative 5 may amplify business sensitivity to other factors affecting recreation participation.

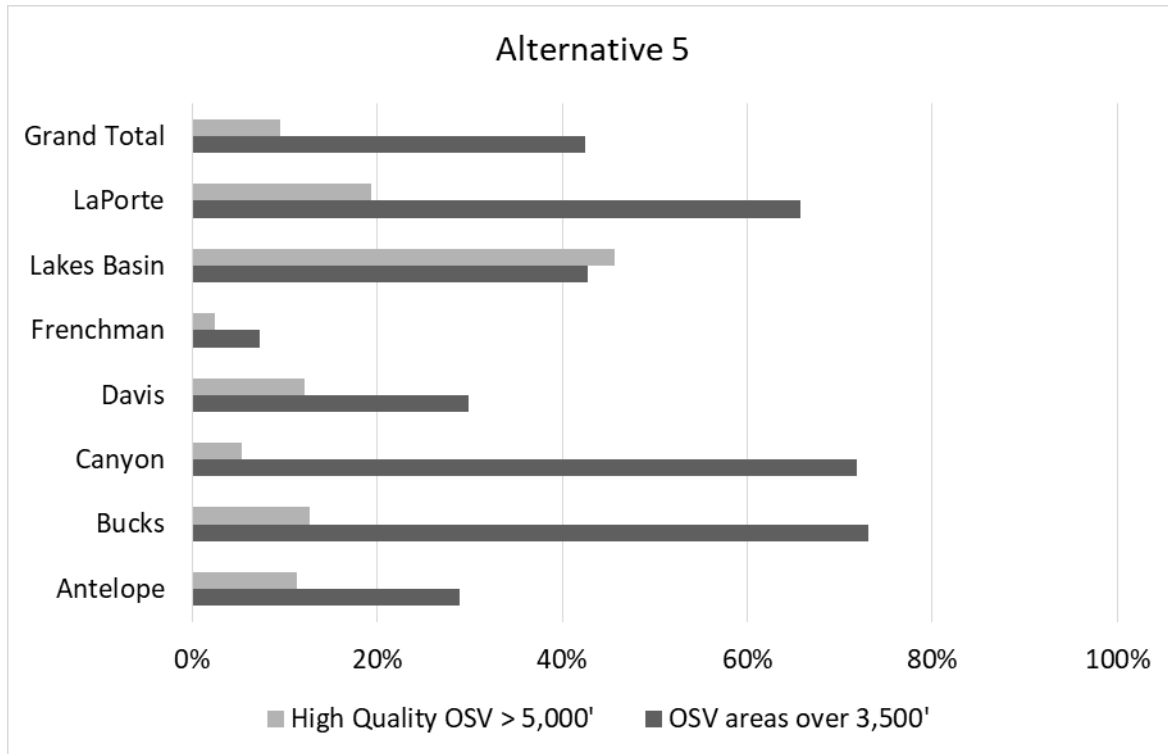


Figure 27. Alternative 5 changes to OSV opportunities by region

Quality of Life

Alternative 5 would have similar effects to quality of life described under alternative 3. However, alternative 5 would provide for 273,607 acres of high-quality OSV areas designated for OSV use, roughly 20,000 more acres than alternative 3.

Environmental Justice

Alternative 5 is not expected to create or disproportionately distribute risk to low-income or minority communities related to the Plumas National Forest. The discussion under “effects common to all alternatives” provides information on the considerations and rationale supporting this determination.

Table 92. Socioeconomic resource indicators and measures for alternative 5 direct and indirect effects

Resource Element	Resource Indicator (Quantify if possible)	Measure (Quantify if possible)	Alternative 5
Economic activity	Employment, income, tax revenue	<u>Total Jobs ~11.3</u> Snowmobiling ~ 3.8 Cross-country skiing ~ 7.5 <u>Total Labor Income~ \$383,411</u> Snowmobiling ~\$129,751 Cross-country Skiing~ \$253,660	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect
Quality of life	Recreation Quality	<u>Per Capita Designations (2028)</u> Snowmobiling ~ 0.7 acres/person; 0.0005 mile of snow trails (available for grooming) Cross-country Skiing~ 0.2 acre/person	<u>Direct/Indirect Effect</u> Motorized Use -Minor adverse Non-Motorized use – Minor beneficial
Quality of life	Values, beliefs, and attitudes	See discussion on qualitative evaluation of public values, beliefs, and attitudes.	<u>Direct/Indirect Effect</u> Minor adverse effect to Motorized Recreationist; Moderate beneficial effect to non-motorized recreationist. <u>Cumulative Effect</u> No Effect
Environmental Justice	Low-income and minority populations	Change in the distribution of risk to economic well-being and cultural resources.	<u>Direct/Indirect/Cumulative</u> No effect

Cumulative Effects – Alternative 5

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

The cumulative effects under alternative 5 would be similar to the cumulative effects described under alternative 2 - modified.

Summary

Table 93 displays a comparison of each alternative's socioeconomic consequences.

Compliance with LRMP and Other Relevant Laws, Regulations, Policies and Plans

The no-action alternative would not be in compliance with Subpart C of the Travel Management Regulation, which requires designation of roads, trails, and areas on NFS lands to provide for OSV use.

The modified proposed action, and alternatives 3, 4, and 5 would be in compliance with Subpart C of the Travel Management Regulation. These alternatives would also be in compliance with the Forest Plan direction to provide diverse off-highway and winter recreation opportunities.

Table 93. Summary comparison of environmental effects to socioeconomic resources

Resource Element	Indicator/ Measure	<u>Alternative 1</u> (No Action)	<u>Alternative 2</u> Modified	<u>Alternative 3</u> (non-motorized experience)	<u>Alternative 4</u> (motorized experience)	<u>Alternative 5</u> (non-motorized, issue)
Economic activity	Employment, income, tax revenue	No effect	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect	<u>Direct/Indirect Effect</u> Negligible beneficial effect <u>Cumulative Effect</u> No effect
Quality of life	Recreation visitation	No effect	<u>Direct/Indirect Effect</u> Motorized Use - Negligible adverse Non-Motorized use – negligible beneficial	<u>Direct/Indirect Effect</u> Motorized Use -Minor adverse Non-Motorized use – Minor beneficial	<u>Direct/Indirect Effect</u> Motorized Use - Minor beneficial Non-Motorized use – No effect	<u>Direct/Indirect Effect</u> Motorized Use - Minor adverse Non-Motorized use – Minor beneficial
Quality of life	Values, beliefs, and attitudes	No effect	<u>Direct/Indirect Effect</u> Motorized Use – negligible effect Non-motorized use – minor beneficial <u>Cumulative</u> – No effect	<u>Direct/Indirect Effect</u> Minor adverse to Motorized Recreationist; Moderate beneficial to non-motorized recreationist <u>Cumulative</u> – No effect	<u>Direct/Indirect Effect</u> Moderate benefit to Motorized Recreationist Minor adverse effect to non-motorized recreationist <u>Cumulative</u> – No effect	<u>Direct/Indirect Effect</u> Minor adverse to Motorized Recreationist; Moderate beneficial to non-motorized recreationist <u>Cumulative</u> – No effect
Environmental Justice	Low-income and minority populations	No effect	<u>Direct/Indirect/ Cumulative</u> - No effect in the distribution of risk to low income and minority communities	<u>Direct/Indirect/ Cumulative</u> - No effect in the distribution of risk to low income and minority communities	<u>Direct/Indirect/ Cumulative</u> - No effect in the distribution of risk to low income and minority communities	<u>Direct/Indirect/ Cumulative</u> - No effect in the distribution of risk to low income and minority communities

Transportation

Potential effects on public safety and traffic were evaluated by considering the interface between motor vehicle use and other uses of the road and trail systems. Cost and affordability were evaluated in terms of changes to the total cost of maintaining the Plumas National Forest transportation system that would be open to motor vehicle use. This analysis would not involve standard (wheeled motor vehicle) road maintenance costs. The effects to the underlying National Forest System (NFS) roads and trails, including wear and tear that may affect wheeled motor vehicle use were also evaluated. Minimization and other specific design criteria, mitigation and monitoring measures have been identified for all action alternatives to minimize potential impacts.

Methodology

Information Sources

The Plumas National Forest, Land and Resource Management Plan, 1988 (FP), Forestwide goals, objectives, standards and guidelines, Page 4-1 provides planning directions; “The hierarchy of management direction for the PNF includes all relevant Federal law, the Forest Service Manual, the Pacific Southwest Regional Guide, PNF Forest Goals and Policies herein, and all other direction of the Plan” (USDA Forest Service 1988). There is limited detailed direction for OSV use in the 1988 plan.

The Forest Transportation Atlas was the primary data used, along with local knowledge of the area to designate OSV use trails. The atlas is primarily composed of roads and motorized trail information contained in geographic information system (GIS) spatial data and Forest Service Infrastructure (INFRA) tabular data. This GIS data was used to designate the over-snow vehicle route network for each alternative. The existing National Forest System roads and OSV-related engineering facilities, including snow parks and parking areas (GIS data) were considered.

All distance figures are approximate values based on the Forest Transportation Atlas (including spatial GIS data and tabular INFRA data) and are limited to the accuracy of those sources which includes measurements from GIS, GPS, field instruments and aerial photography. Trail miles were updated throughout the planning process as information was refined and made available, and may change slightly with additional field verification and project implementation.

Assumptions

Assumptions used to analyze effects on user safety, underlying roads, trails and resources include:

- All OSV recreationists would follow applicable laws and designations described under each alternative.
- Effects analysis is based on proposed OSV trails where the Forest Service has jurisdiction.

Assumptions include restrictions, prohibitions, and features common to all action alternatives described in FEIS chapter 2.

Spatial and Temporal Context for Effects Analysis

The affected spatial area where direct, indirect, and cumulative transportation effects from proposed activities involves the project area (Plumas National Forest).

The temporal boundaries for transportation effects from the proposed activities are indefinite, as long as snow conditions exist to provide for the designations described under each alternative.

Scope of Action

The decision resulting from this analysis would not designate NFS roads for public OSV use. Existing snow covered NFS roads would be designated as NFS trails where public OSV use is permitted.

The decision from this Over-snow Vehicle Use Designation analysis would designate areas and trails for public OSV use in accordance with Travel Management Rule, 36 CFR Part 212, Subpart C. It is not a comprehensive, holistic winter recreation planning effort and would not designate all NFS roads for public OSV use.

Managing wheeled, motorized vehicle use is not within the scope of this action. Other types of motor vehicles that may operate over snow, that do not meet the definition of an OSV, are managed under Subpart B of the Travel Management Regulations. Routes and areas for these types of vehicles were previously designated and these route designations have been published on a motor vehicle use map (MVUM) as the result of a separate environmental analysis and decision (USDA 2019).

Subpart C of the Travel Management Regulations specifies that certain requirements of Subpart B will continue to apply to the decision designating National Forest System OSV areas and trails (36 CFR 212.81(d)), including:

- Public involvement as required by the National Environmental Policy Act (36 CFR 212.52);
- Coordination with Federal, State, County, and other local governmental entities and tribal governments (36 CFR 212.53);
- Consider criteria for designating roads, trails, and areas (36 CFR 212.55);
- Identify designated uses on a publicly available use map of roads, trails, and areas (36 CFR 212.56); and
- Monitor effects (36 CFR 212.57).

In developing alternatives, the interdisciplinary team applied the minimization criteria to each specific area and trail designated for OSV use (FEIS chapter 1).

From this analysis and decision, the Forest Service would produce an OSV use map (OSVUM) that would be formatted similar to the existing MVUM for the Plumas National Forest. The OSV use map would allow OSV recreationists to identify areas and trails where OSV use is designated in the Plumas National Forest.

Topics and Issues Addressed in this Analysis

Resource Indicators and Measures

Indicators and measures for transportation and engineering effects include:

- Measurement Indicator 1: Public Safety & Traffic - For each alternative describe the effects on public safety. Discuss the proposed changes to the trail system and effects it would have to motor vehicle operators and other users of the trail system. Note any instances where the proposed designation would allow operation of motor vehicles in a manner inconsistent with State law.

- Measurement Indicator 2: Affordability (Costs) – For each alternative describe how over-snow uses and grooming would affect annual maintenance cost of the Forest Transportation System (FTS) that would be open to motor vehicle use. Include any annual maintenance changes associated with OSV use. This analysis will not involve road maintenance costs associated with standard wheeled motor vehicles.
- Measurement Indicator 3: Roads and Trails – Describe effects to underlying NFS roads and trails, including wear and tear that may potentially affect wheeled motor vehicle use.

This analysis uses qualitative indicators and measures, due to the nature of the resource and scope or scale of the alternatives.

Affected Environment

Existing Condition

Under alternative 1, no areas would be designated for OSV use; however, public OSV use would continue to be allowed in all areas of the Plumas National Forest (1,147,825 acres) except for areas with existing prohibitions (Bucks Lake Wilderness (21,000 acres), Challenge Experimental Forest (3,400 acres), the Pacific Crest Trail (79 miles), (approximately 170 acres), within Rx-11 Bald Eagle Habitat Prescription (Plumas LRMP EIS, USDA Forest Service, 1988, p. 3-24) (Plumas LRMP EIS, USDA Forest Service, 1988, p. 4-96). The wild zone of Wild and Scenic Rivers as well, permit no additional motorized access routes along the Middle Fork of the North Fork Feather River (Plumas LRMP, USDA Forest Service, 1988, pp. 4-69 and 4-70). The Plumas National Forest existing facilities include 4,137 miles of system roads (USDA Forest Service 1988). Existing conditions for OSV use, trail miles, grooming and snow depth requirements, open and restricted areas for OSV use are described under alternative 1.

Desired Condition

Travel Management Regulations 36 CFR Part 212 Subpart C, directs the Forest Service to identify and designate areas and trails for public over-snow vehicle (OSV) use on National Forest System lands within the Plumas National Forest. The Forest Service would also identify designated trails where grooming for public OSV use would occur consistent with the Travel Management Regulations at 36 CFR Part 212 Subpart C. Areas and trails designated for public over-snow vehicle use would be displayed on a publicly available over-snow vehicle use map (OSVUM). Proposed actions related to OSV use are described under Alternative 2, modified proposed action. Alternative 2 - modified is the preferred alternative.

Management Requirements and Mitigation Measures Common to All Action Alternatives

Minimization criteria and resource specific management requirements for OSV use, trail grooming, Pacific Crest Trail protection and other measures common to all action alternatives, were developed to minimize effects on soil, watershed, vegetation, and other resources (36 CFR 212.55(b)(1)).

Management requirements and mitigation measures common to all alternatives include designated, restricted and prohibited areas and trails, exemptions and trail grooming requirements.

National Best Management Practices (BMPs) would be applied to protect water and soil resources on National Forest System lands (USDA Forest Service 2012; FEIS appendix C).

At trailheads, parking areas and staging areas, suitable measures would be used to trap and treat pollutants from over-snow vehicle emissions in snowmelt runoff; or staging areas would be located a sufficient distance from nearby waterbodies to provide adequate protection.

The PCT would be closed to OSV travel. OSV trails would be designated to provide PCT crossings.

Minimization criteria and specific designation criteria were applied for alternative development.

Resource protection measures are described in the FEIS chapter 2.

Trail Grooming

California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, provides directions for trail grooming.

- Grooming shall only occur on trails identified or designated in the Over-Snow Vehicle Use Designation project's Record of Decision.
- Grooming shall not occur when the ground surface is exposed and soil damage or rutting could occur. The operator shall consider recent, current, and forecasted weather and snow conditions to ensure these conditions are met.
- Follow California State Parks Off-Highway Motor Vehicle Recreation (OHMVR) Division snow depth grooming standards.
- Grooming operators shall be trained and directed by a grooming coordinator.
- Hazards shall be identified in advance of grooming, preferably in autumn before snow falls.
- Initial grooming of trails (1st grooming of the year) shall only occur when there is 18 inches or more of snow present to ensure that no contact with native soil or vegetation occurs or disturbance of the trail or underlying road surface. All subsequent grooming shall only occur when there is 12 inches or more of snow present.
- Typical grooming season is from December and continues through March. Start and stop times vary per trail location and are dependent upon the presence and depth of snow.
- Maintain a 10-foot vertical clearance from potential obstructions.
- Groom trails to a minimum of 10 feet wide with a typical width of 10 to 14 feet.
- Groom trails up to 30 feet wide in more heavily used areas such as near trailheads to facilitate added traffic.
- Groomed trail width should not exceed the width of the underlying roadbed.
- Operate snowcats / grooming machines at speeds between 3 and 7 miles per hour.
- Operate snowcats / grooming machines with warning lights on at all times.
- Do not operate a snowcat / grooming machine for longer than a 12-hour duration during peak season of use.
- Store all fuel, other chemicals, and spill containment equipment at groomer storage facilities or outside riparian conservation areas (RCAs).
- Maintain and refuel all grooming equipment at the storage facilities or outside of RCAs.
- The California OHMVR Division's snowcat fleet must adhere to the emission regulations set by the California Air Resources Board (CARB).

Climate Change

Climate change and extreme weather events could impact forest lands infrastructure such as roads, bridges, and culverts (USDA Forest Service 2015). Heavy precipitation, could increase in the future, and overload existing infrastructure, at parking and staging areas, that have not been built to that capacity. Extreme weather events may require more frequent road and other infrastructure maintenance, even if designed to appropriate specifications (USDA Forest Service 2015). Potential climate change effects could also require additional transportation network planning and changes in infrastructure design. Climate change effects would be similar for all alternatives.

Forest Plan Direction

Alternatives 2 - modified, 3, 4, and 5 would comply with the Plumas Forest Plan.

Environmental Consequences

No action (alternative 1) and action alternatives 2 - modified, 3, 4, and 5 were analyzed and are described below.

Alternative 1 – No Action

Direct and Indirect Effects - Alternative 1

Under alternative 1, approximately 227 miles of OSV trails available for use and 203 miles of existing OSV trails are groomed for seasonal use (this includes NFS and County roads). Twenty-four miles are available for OSV use and not groomed. The Plumas National Forest does not have a current OSV use map available for winter sports activities.

Under alternative 1, there would be no changes to the existing OSV use on roads, trails, and areas within the Plumas National Forest except as prohibited by Forest Order. Only restrictions specified in the Plumas Forest Plan and contained in existing Forest Orders would continue. The Travel Management Regulations, Subpart C, would not be implemented, and no OSV use map would be produced. Snowmobiling information at staging area, snowmobile rules, regulations, and forest maps provide adequate information to maintain public safety and avoid traffic conflicts.

There may be minor additional maintenance costs from over-snow vehicle use of access roads, parking and staging areas as described under alternative 1.

Current snow trail grooming management using OHMVR Division funds and equipment follows OHMVR snow depth standards. The minimum 12-inch snow depth requirement provides adequate protection of roads and trails under the snow.

Table 94 displays alternative 1 effects on public safety and traffic, OSV use effects on the cost of maintaining the transportation system and effects on road and trail surfaces.

Table 94. Transportation and engineering resource indicators and measures for alternative 1 effects

Resource Element	Resource Indicator	Measure	Alternative 1
Safety	Public safety and traffic	Qualitative effects to motor vehicle operators and other users of the trail system	The current Plumas National Forest maps and signs provide adequate information to maintain a reasonable level of public safety and avoid traffic conflicts
Cost	Affordability	Qualitative effects to the total cost of maintaining the Forest transportation system (FTS) that will be open for motor vehicle use	Minor effects (minor additional costs) due to over-snow vehicle use of access roads to popular parking and staging areas.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	There are no current Forest Plan snow depth standards for cross-country over-snow vehicle travel and along OSV use trails. The Plumas National Forest current management for snow trail grooming using OHMVR Division funds and equipment follows OHMVR snow depth standards. Minimum snow depth requirements of 12 inches provide adequate protection of underlying roads and trails.

Cumulative Effects

There would be negligible cumulative effects from past, present, and reasonably foreseeable future activities under all alternatives. Effects on public safety, road maintenance costs and effects on underlying roads and trails would be negligible.

Past, present, and reasonably foreseeable activities relevant to cumulative effects analysis apply to all action alternatives. Refer to appendix G, Volume II of this FEIS for a complete list of present and foreseeable future actions.

There would be negligible cumulative effects under all alternatives. Effects on public safety, road maintenance costs and effects on underlying roads and trails would be negligible.

Cumulative Effects - Alternative 1

There would be negligible cumulative effects from past, present, and reasonably foreseeable activities under alternative 1. Effects on public safety, road maintenance costs and effects on underlying roads and trails would be negligible. Measurement indicators and cumulative effects are shown in table 95.

Table 95. Transportation and engineering resource indicators and measures for alternative 1 cumulative effects

Resource Element	Resource Indicator	Measure	Alternative 1
Safety	Public Safety and Traffic	Qualitative effects to motor vehicle operators and other users of the trail system	Negligible cumulative effects; temporary closures for harvest or vegetation treatment and other forest operations activities would eliminate use conflicts.
Cost	Affordability	Qualitative effects to the total cost of maintaining the Forest transportation system (FTS) open for motor vehicle use	Negligible cumulative effects.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	Negligible cumulative effects; use of temporary closures and proper use of snow plowing requirements (mitigation measures) for harvest and other forest operations would minimize cumulative effects.

Alternative 2 – Modified Proposed Action

Direct and Indirect Effects – Alternative 2 - Modified

Effects under alternative 2 - modified would be similar to alternative 1. The over-snow vehicle use map, to be prepared, would provide adequate information to maintain public safety and avoid traffic conflicts.

The minimum snow or ice depth of 12 inches for cross-country travel, 6 inches of snow or ice for designated trail use and 12 inches of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.

Minor additional maintenance costs may occur due to over-snow vehicle use of access roads to popular parking and staging areas:

- Freezing and thawing of road subgrade resulting in asphalt cracking;
- Exposure of native surface or asphalt due to grooming, use or rain-on-snow events resulting in shortened life-cycle of the infrastructure; and
- Improvements or maintenance to the storm drainage system may be required due to increased runoff and/or earlier snowmelt.

Table 96 displays alternative 2 - modified effects on public safety and traffic, OSV use effects on the cost of maintaining the transportation system, and effects on road and trail surfaces.

Table 96. Transportation and engineering resource indicators and measures for alternative 2 - modified direct effects

Resource Element	Resource Indicator	Measure	Alternative 2 - modified
Safety	Public safety and traffic	Qualitative effects to motor vehicle operators and other users of the trail system	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the map and related information would also help snowmobile operators understand allowed uses and prohibitions.
Cost	Affordability	Qualitative effects to the total cost of maintaining the Forest transportation system (FTS) that will be open to motor vehicle use	Minor effects (minor additional maintenance costs) due to over-snow vehicle use of access roads to popular parking and staging areas.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	Minimum snow depth requirements; 12 inches of snow or ice for cross-country OSV travel, 6 inches of snow or ice for designated trail use and 12 inches of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.

Cumulative Effects - Alternative 2 - Modified

There would be negligible cumulative effects from past, present, and reasonably foreseeable activities under alternative 2 - modified. Effects on public safety, road maintenance costs, and effects on underlying roads and trails would be negligible. Measurement indicators and cumulative effects are shown in table 97.

Table 97. Transportation and engineering resource indicators and measures for alternative 2 - modified cumulative effects

Resource Element	Resource Indicator	Measure	Alternative 2 - modified
Safety	Public Safety and Traffic	Qualitative effects to motor vehicle operators and other users of the trail system	Negligible cumulative effects; temporary closures for timber harvest and other forest activity operations would eliminate use conflicts.
Cost	Affordability	Qualitative effects to the total cost of maintaining the Forest transportation system (FTS) open for motor vehicle use	Negligible cumulative effects.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	Negligible cumulative effects; use of temporary closures and proper use of snow plowing requirements for vegetation treatment and other forest operations would minimize cumulative effects.

Alternative 3

Direct and Indirect Effects - Alternative 3

Effects under alternative 3 would be similar to other alternatives. The over-snow vehicle use map would provide adequate information to maintain public safety and avoid traffic conflicts.

Minimum snow depth requirements; 18 inches of snow or ice for cross-country travel, 18 inches of snow for designated trail use and 12 inches of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads. Snow depths would be measured at specified locations by Forest Service personnel.

Minor additional maintenance costs may occur from over-snow vehicle use of access roads, parking and staging areas as described in alternative 1.

Table 98 displays effects on public safety and traffic, OSV use effects on the cost of maintaining the transportation system and wear and tear effects on road and trail surfaces under alternative 3.

Table 98. Transportation and engineering resource indicators and measures for alternative 3 direct effects

Resource Element	Resource Indicator	Measure	Alternative 3
Safety	Public safety and traffic	Qualitative effects to motor vehicle operators and other users of the trail system	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the OSV use map and related information would also help snowmobile operators understand allowed uses and prohibitions.
Cost	Affordability	Qualitative effects to the total cost of maintaining the Forest transportation system (FTS) that will be open to motor vehicle use	Minor effects (minor additional maintenance costs) due to over-snow vehicle use of access roads to popular parking and staging areas.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	Minimum snow depth requirements; 18 inches of snow or ice for OSV cross-country travel, 18 inches of snow for designated trail use and 12 inches of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.

Cumulative Effects - Alternative 3

There would be negligible cumulative effects under alternative 3. Effects on public safety, road maintenance costs and effects on underlying roads and trails would be negligible. Measurement indicators and cumulative effects are shown in table 99.

Table 99. Transportation and engineering resource indicators and measures for alternative 3 cumulative effects

Resource Element	Resource Indicator	Measure	Alternative 3
Safety	Public safety and traffic	Qualitative effects to motor vehicle operators and other users of the trail system	Negligible cumulative effects; temporary closures for harvest, vegetation treatment and other forest operations activities would eliminate use conflicts.
Cost	Affordability	Qualitative effects to the total cost of maintaining the Forest transportation system (FTS) open for motor vehicle use	Negligible cumulative effects.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	Negligible cumulative effects; use of temporary closures and proper use of snow plowing requirements and mitigation measures for vegetation treatment and other forest operations activities would minimize cumulative effects.

Alternative 4

Direct and Indirect Effects - Alternative 4

Effects under alternative 4 would be similar to other action alternatives. The over-snow vehicle use map would provide adequate information to maintain public safety and avoid traffic conflicts.

Minimum snow depth requirement of 12 inches of snow or ice for cross-country OSV travel, would protect underlying vegetation, resources, roads and trails. No minimum snow depth for trails could potentially result in damage to underlying roads and trails

There would be no minimum snow depth for trail grooming. California State Department of Parks and Recreation Off-Highway Motor Vehicle Recreation Division snow depth standards for grooming, currently require 12 inches of snow accumulation. If the 12 inches of snow depth standards are followed for grooming there would be adequate protection and little or no adverse effects on underlying roads and trails.

Minor additional maintenance costs may occur from over-snow vehicle use of access roads, parking and staging areas as described under alternative 1.

Table 100 displays effects on public safety and traffic, OSV use effects on the cost of maintaining the transportation system and wear and tear effects on road and trail surfaces under alternative 4.

Table 100. Transportation and engineering resource indicators and measures for alternative 4 direct effects

Resource Element	Resource Indicator	Measure	Alternative 4
Safety	Public safety and traffic	Qualitative effects to motor vehicle operators and other users of the trail system	The over-snow vehicle use map and guide would provide adequate information to maintain public safety and avoid traffic conflicts. The use map and related information would also help snowmobile operators understand allowed uses and prohibitions.
Cost	Affordability	Qualitative effects to the total cost of maintaining the forest transportation system (FTS) that will be open to motor vehicle use	Minor effects (minor additional maintenance costs) due to over-snow vehicle use of access roads to popular parking and staging areas.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	Minimum snow depth requirement of 12 inches for cross-country OSV travel would protect resources. There would be no minimum snow depth requirement for OSV use on designated trails and for trail grooming. If OSV use occurs on designated trails or if trail grooming is done with inadequate snow depth, there could be adverse effects on underlying roads and trails

Cumulative Effects - Alternative 4

There would be negligible cumulative effects under alternative 4. Effects on public safety, road maintenance costs and effects on underlying roads and trails would be negligible. Measurement indicators and cumulative effects are shown in table 101.

Table 101. Transportation and engineering resource indicators and measures for alternative 4 cumulative effects

Resource Element	Resource Indicator	Measure	Alternative 4
Safety	Public Safety and Traffic	Qualitative effects to motor vehicle operators and other users of the trail system	Negligible cumulative effects; temporary closures for timber harvest and other forest operations would eliminate use conflicts.
Cost	Affordability	Qualitative effects to the total cost of maintaining the Forest transportation system (FTS) open for motor vehicle use	Negligible cumulative effects.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	Negligible cumulative effects; use of temporary closures and proper use of snow plowing requirements for harvest and other forest activity operations would minimize cumulative effects.

Alternative 5

Direct and Indirect Effects - Alternative 5

Effects under alternative 5 would be similar to alternative 2 - modified. The over-snow vehicle use map and guide, to be prepared, and road signs would provide adequate information to maintain public safety and avoid traffic conflicts.

The minimum snow or ice depth of 24 inches for cross-country travel, 12 inches of snow or ice for designated trail use, and 12 inches or more of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads.

Minor additional maintenance costs may occur due to over-snow vehicle use of access roads to popular parking and staging areas:

- Freezing and thawing of road subgrade resulting in asphalt cracking;
- Exposure of native surface or asphalt due to grooming, use or rain-on-snow events resulting in shortened life-cycle of the infrastructure; and
- Improvements or maintenance to the storm drainage system may be required due to increased runoff and/or earlier snowmelt.

Table 102 displays effects on public safety and traffic, OSV use effects on the cost of maintaining the transportation system and wear and tear effects on road and trail surfaces under alternative 5.

Table 102. Transportation and engineering resource indicators and measures for alternative 5 direct effects

Resource Element	Resource Indicator	Measure	Alternative 5
Safety	Public safety and traffic	Qualitative effects to motor vehicle operators and other users of the trail system	The over-snow vehicle use map, recreation guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts. The OSV use map and related information would also help snowmobile operators understand allowed uses and prohibitions.
Cost	Affordability	Qualitative effects to the total cost of maintaining the Forest transportation system (FTS) that would be open to motor vehicle use	Minor effects (minor additional maintenance costs) due to over-snow vehicle use of access roads to popular parking and staging areas.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	Minimum snow depth requirements; 24 inches of snow or ice for cross-country OSV travel, 12 inches of snow or ice for designated trail use and 12 inches or more of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.

Cumulative Effects - Alternative 5

There would be negligible cumulative effects under alternative 5. Effects on public safety, road maintenance costs and effects on underlying roads and trails would be negligible. Cumulative effects measurement indicators are shown in table 103.

Table 103. Transportation and engineering resource indicators and measures for alternative 5 cumulative effects

Resource Element	Resource Indicator	Measure	Alternative 5
Safety	Public safety and traffic	Qualitative effects to motor vehicle operators and other users of the trail system	Negligible cumulative effects; temporary closures and signs for timber harvest, vegetation treatment and other forest operations would eliminate use conflicts.
Cost	Affordability	Qualitative effects to the total cost of maintaining the Forest transportation system (FTS) open for motor vehicle use	Negligible cumulative effects.
Transportation property	Effects to underlying NFS roads and trails	Wear and tear that may affect wheeled motor vehicle use	Negligible cumulative effects; use of temporary closures and proper use of snow plowing requirements, mitigation measures, and project design criteria for harvest and other forest activity operations would minimize cumulative effects.

Summary

Summary of Environmental Effects

Effects are similar for all alternatives. A summary of OSV use effects on public safety, road maintenance cost, adverse effects on underlying roads, trails and use areas under alternatives 1 through 5 are shown in table 104.

Cumulative effects on public safety, road maintenance costs, and on underlying roads and trails would be negligible.

Compliance with LRMP and Other Relevant Laws, Regulations, Policies and Plans

36 CFR 212

Alternatives 2 - modified, 3, 4 and 5 are compliant with applicable direction, since they all involve production of an over-snow motor vehicle use map as required in Subpart C of the travel management regulations (36 CFR 212).

Alternative 1 does not involve production of an over-snow motor vehicle use map as required in Subpart C of the travel management regulations. Alternative 1 is otherwise compliant with applicable direction.

Forest Plan Direction

Alternatives 2 - modified, 3, 4, and 5 would comply with the Plumas Forest Plan.

Table 104. Summary comparison of effects to transportation and engineering resources

Resource Element	Indicator/ Measure	Alternative 1	Alternative 2 - modified	Alternative 3	Alternative 4	Alternative 5
Safety	Public safety and traffic	The current Plumas National Forest winter sports, snowmobiling and non-motorized activity information and maps and signs provide adequate information to maintain a reasonable level of public safety and avoid traffic conflicts.	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the OSV use map would also improve understanding of allowed uses and prohibitions.	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the OSV use map would also improve understanding of allowed uses and prohibitions.	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the OSV use map would also improve understanding of allowed uses and prohibitions.	The over-snow vehicle use map, guide and signs would provide adequate information to maintain public safety and avoid traffic conflicts; the OSV use map would also improve understanding of allowed uses and prohibitions.
Cost	Affordability	Minor additional maintenance costs due to over-snow vehicle use of access roads to popular parking and staging areas.	Minor additional maintenance costs due to over-snow vehicle use of access roads to popular parking and staging areas.	Minor additional maintenance costs due to over-snow vehicle use of access roads to popular parking and staging areas.	Minor additional maintenance costs due to over-snow vehicle use of access roads to popular parking and staging areas.	Minor additional maintenance costs due to over-snow vehicle use of access roads to popular parking and staging areas.
Transportation property	Effects to underlying NFS roads and trails	There are no current Forest Plan standards for cross-country over-snow vehicle travel and along OSV use trails. The Plumas National Forest current management for snow trail grooming using OHMVR Division funds and equipment follows OHMVR snow depth standards. Minimum snow depth requirements of 12 to 18 inches provide adequate protection of underlying roads and trails.	Minimum snow depth requirements; 12 inches of snow or ice for cross-country OSV travel, 6 inches of snow or ice for designated trail use and 12 inches of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.	Minimum snow depth requirements; 18 inches of snow or ice for OSV cross-country travel, 18 inches of snow for designated trail use and 12 inches or more of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.	Minimum snow depth requirement of 12 inches for cross-country OSV travel would protect resources. There would be no minimum snow depth requirement for OSV use on designated trails and for trail grooming. If OSV use occurs on designated trails or if trail grooming is done with inadequate snow depth, there could be adverse effects on underlying roads and trails.	Minimum snow depth requirements; 24 inches of snow or ice for cross-country OSV travel, 12 inches of snow or ice for designated trail use and 12 inches or more of snow for grooming would avoid damage to resources and would provide adequate protection of underlying roads and trails.

Soils

The purpose of this section is to analyze the potential impacts (direct, indirect and cumulative effects) of over-snow vehicles (OSVs) on the soil resource by alternative within the Plumas National Forest.

Methodology and Information Sources

The soil resources were analyzed within the project area using geographic information system (GIS) data, soils survey data, corporate soils data layers including the geology and geomorphology layers for the Plumas National Forest, a variety of reports and assessments of OSV impacts, and professional experience and judgement using scientific literature on OSV impacts. The Plumas National Forest Hydrologist and District Hydrologists were consulted to help determine where the sensitive soils might be located in the forest.

Incomplete and Unavailable Information

No field observations were performed and no site-specific soils information was collected to support this analysis. Very little monitoring information is available on OSV impacts to the soil resource. The Plumas National Forest does monitor OSV use, but no specific soils monitoring has been conducted. Assessments of soil resource impacts of OSV use were primarily based on the scientific literature.

To determine where potential sensitive soils might be located in the forest, the soil survey and corporate soil data layers were used along with other corporate GIS layers to determine where meadow soils and soils with erosion potential might be located.

Spatial and Temporal Context for Effects Analysis

Direct and Indirect and Cumulative Effects Boundaries

The spatial boundaries for analyzing the direct, indirect, and cumulative effects to the soil resource are the area of land managed by the Plumas National Forest.

The short-term temporal boundary for analyzing the direct, indirect, and cumulative effects to the soil resource is 1 year; the long-term temporal boundary is 10 years because climate changes, unforeseeable future projects, and other factors make assumptions beyond this timeframe speculative.

Topics and Issues Addressed in This Analysis

Resource Indicators and Measures

Support for plant growth and function has been chosen as the resource indicator to examine differences in soil effects between alternatives (table 105). The Region 5 soil quality guidelines state the indicators to examine are soil hydrologic function, support for plant growth function and buffering capacity function. Soil productivity and soil stability are used as indicators for soil hydrologic and support for plant growth functions. For the proposed alternative actions, soil stability is a primary relevant indicator for both functions. OSV use does not affect soil buffering capacity.

Table 105. Soil resource indicators and measures for assessing effects

Resource Element	Resource Indicator	Measure (Quantify if possible)
Soil Productivity and Soil Stability	OSV use on sensitive soils including wet meadows, areas with potential low stability and areas with potential erosion hazards.	Acres of cross-country travel designated for OSV use on sensitive soils
Soil Stability	Minimum snow depths on trails	Inches of snow
Soil Productivity	Minimum snow depths for cross-country travel	Inches of snow
Soil Productivity	Total area designated for OSV use	Acres open to cross-country OSV travel

Affected Environment

Existing Condition

The Plumas National Forest has diverse vegetation because of its wide ranges in precipitation and elevation. On the western portion of the forest, ponderosa pine, sugar pine, Douglas fir, white fir and incense cedar are commonly found and soils are typically deep and well drained. On the eastern portion of the forest, ponderosa pine, Jeffrey pine, oak woodlands, and sagebrush are commonly found. Elevations range from 900 feet in the western foothills to over 8,000 feet at Mt. Ingalls. Average annual temperatures range from 46 to 57 degrees Fahrenheit with 15 to 70 inches of precipitation falling a year, most of which occurs during the winter months.

Soils and Geology

The terrain within the Plumas National Forest is rugged, mountainous, and very steep in places with diverse geology, and in turn, complex soil formation. In the western portion of the forest, steep canyons have been carved by rivers and narrow plateaus with moderate relief stand between the canyon walls. The eastern portion of the forest is part of the Basin and Range province, with forested areas and broad valleys. Metamorphic serpentine, schist, and metavolcanic rocks are the oldest in the forest and are moderately susceptible to landslides. The granitic rocks intruded in to the older metamorphic rocks, and these areas with granitic parent materials tend to be susceptible to erosion. Finally, the volcanic rocks (mudflow breccia, basalt, and andesite) from the Tertiary age are the most susceptible to massive landslides and are found in the eastern and central portions of the forest. Portions of the forest that are warmer and more humid on the western side and soils on north-facing slopes tend to have deeper, more productive soils. The valley areas of the forest are dominated by alluvial deposits.

The soils are grouped into 290 soil map units with a variety of different parent materials present.

Soil Productivity

Soil productivity is important to maintain. Soil organic matter and soil porosity are two indicators of soil productivity. The importance of soil organic matter cannot be overstated (Jurgensen et al. 1997). This organic component contains a large reserve of nutrients and carbon, and it is dynamically alive with microbial activity. The character of forest soil organic matter influences many critical ecosystem processes, such as the formation of soil structure, which in turn influences soil gas exchange, soil water infiltration rates, and soil water-holding capacity. Soil organic matter is also the primary location of nutrient recycling and humus formation, which enhances soil cation exchange capacity and overall fertility. Organic matter including the forest floor and large woody material are essential for maintaining ecosystem function by supporting moderate soil temperatures, improved water availability and bio-diversity (Page-Dumroese et al. 2010).

Soil porosity refers to the amount and character of void space within the soil. In a “typical” soil, approximately 50 percent of the soil volume is void space. Pore space is lost primarily through mechanical compaction. Three fundamental processes are negatively impacted by compromised soil pore space:

- Gas exchange;
- Soil water infiltration rates; and
- Water-holding capacity.

Gas Exchange

Soil oxygen is fundamental to all soil biologic activity. Roots, soil fauna, and fungi all respire, using oxygen while releasing carbon dioxide. When gas exchange is compromised, biologic activity is also compromised. Maintaining appropriate soil biologic activity is paramount when considering long-term forest vitality.

Soil Water Infiltration Rates

Severely compacted soils do not allow appropriate water infiltration, leading to overland flow and associated erosion, sediment delivery, spring flooding, and low summer flows. Travel over snow or frozen is not expected to cause soil compaction and therefore the soils maintain pore spaces for infiltration.

Soil productivity within the Plumas National Forest could be most affected by OSV use within sensitive soil types including soils within wet meadow areas and soils that are prone to erosion. Wet meadow soils are located on less than one percent of the Plumas National Forest. Maintaining a minimum snow depth to not disturb the organic matter at the soil surface or compact the soil and reduce soil porosity is essential to minimizing the effects of OSV use on the soil resource in these sensitive areas.

Soil Stability

Shallow debris slides are the most common and most destructive type of landslide found in the Plumas National Forest, but deeper mass movements, road cut failures, stream channel instability, and rockfalls also occur. Land instability is not extensive in the Forest. Most instability features are found in the steep canyons and inner gorges in the lower elevations of the western part of the Forest. Preliminary landslide hazard work in adjacent Forests shows a higher rate of occurrence of land sliding in various contact zones beneath the Mehrten Formation (5,716 acres), more often on north facing slopes where springs occur. Ultramafic and serpentine soils also have shown moderate instability and they occur on approximately 55,736 acres across the forest (approximately 5 percent of the forest). Other potentially unstable areas in the forest include scree and talus deposits. Old landslides are present within the project area on less than one percent of the Forest (10,665 acres). Generally, the instability and slumping only occurs when soils are excavated deeper than 2 feet. Most of the remaining portions of the Forest have low-relief volcanic topography where the stability hazard is low.

Approximately 266,353 (approximately 22 percent of the area) acres across the Forest have a very severe erosion hazard rating when the soils have no vegetation present.

Existing roads also have the potential for soil erosion (Cacek 1989). The dominant processes in roaded areas are surface erosion from bare soil areas of roads, including the cutslope, fillslope, and travelway. Snow cover on roads is an important component in reducing risks of erosion from roads due to OSV use.

Environmental Consequences

Alternative 1 – No Action

Direct and Indirect Effects

Current OSV use would continue on 1,147,825 acres of the Plumas National Forest but would not be designated under the no-action alternative. The current management is inconsistent with the Forest Plan. This area that is open to OSV use is not designated, but would continue to be open to OSV use. Two hundred twenty-seven miles of trails are designated for OSV use, with 203 miles open to grooming. There is no minimum snow depth required prior to OSV use. Currently, there is no minimum snow depth designated by the Plumas National Forest for OSV grooming, but the forest follows the California State Parks' Off-Highway Motor Vehicle Recreation Division snow depth standard for grooming, which is currently 12 to 18 inches of snow.

Soil Productivity

Incidental direct effects of OSV use on and off trails could include compaction, rutting, and disturbance of the forest floor and organic matter within the soil in low-snow areas. Although snowmobiles generally have low ground pressure, the tracks on snowmobiles could churn soil and cause compaction with repeated travel over areas with low snow conditions (Baker and Buthmann 2005; Gage and Cooper 2009). This type of incidental contact with the soil surface or low-snow conditions would likely occur during the fall or spring season, would more likely be found on ridges that are windy and exposed or on south-facing slopes, and would be very limited as OSV recreationists are less likely to risk damage to their machines. Repeated compaction of snow can also alter soil temperatures, potentially changing or reducing microbial activity, but some research has shown that with repeated compaction, soil temperatures were not affected (Gage and Cooper 2009; Keller et al. 2004). Currently, grooming generally occurs when there is 12 to 18 inches of snow on trails, meaning that there is little to no chance that soil would be exposed on groomed OSV trails.

Soils within the Plumas National Forest that may be most prone to compaction and rutting include the meadow soils which occur on approximately 2,748 acres where OSV use would occur under this alternative. These soils tend to have more soil moisture for longer periods throughout the year with finer soil textures. Monitoring of wet meadow areas is recommended to ensure that OSV use is not occurring without adequate snow levels to protect these sensitive soil types.

Moderate snowpack levels have been shown to minimize the potential compaction from OSV use (Gage and Cooper 2009). With adequate snow depth, on-trail and off-trail OSV use would have minimal to no impact on the soil resource, and would not likely lead to any loss of soil productivity. A 12-inch snow depth off trails has been observed to be adequate for cross-country travel and to mitigate and eliminate contact with soil surface, compaction, or rutting or disturbance of organic matter on ungroomed trails (USDA FSH 2509.25 for Region 2). Because there is no minimum snow depth, some loss of soil productivity is likely to occur in areas where the snow depth is less than 12 inches and cross-country OSV travel is occurring.

Soil Stability

With adequate snow depths, cross-country OSV use is unlikely to affect soil stability. Landslides within the Plumas National Forest are generally caused by excavating soil to a depth greater than 2 feet. OSV use on these soils would not lead to excavated soils, and would likely be widely spread out throughout the

forest versus concentrated on landslide prone areas. Even with concentrated use on sites where landslide potential is high, OSV use would not likely cause landslides.

Cross-country use of OSVs could have an effect on ground disturbance that could lead to erosion, especially on soils with high erosion hazard ratings and in areas derived from granitic or rhyolitic parent materials with slopes greater than 40 percent where OSV use is allowed. Depending on site-specific factors including slope, aspect, elevation, level of use, and weather conditions, trails and off-trail riding on steep slopes could contribute to erosion (Baker and Buthmann 2005; Olliff et al. 1999). Adequate snowpack would likely mitigate the potential for erosion on these sites, but with no minimum snow depth required under the current management, potential for erosion is increased if OSV use occurs on bare soil or in areas with less than 12 inches of snow. Generally, OSV operators avoid traveling over bare soil because it can damage their machines.

Trail Grooming

Trail grooming occurs over a National Forest System road or trail. Adequate snowpack is present on the trail prior to grooming and grooming is not likely to cause impacts to the soil resource on trails or roads.

Table 106. Soil resource indicators and measures for alternative 1

Resource Element	Resource Indicator	Measure	Alternative 1- No Action
Soil Productivity and Soil Stability	OSV use on sensitive soils including meadows and areas with potential erosion hazards.	Acres of cross-country travel designated for OSV use on sensitive soils	255,731
Soil Stability	Minimum Snow Depths on trails	Inches of snow	0
Soil Productivity	Minimum snow depths for cross-country travel	Inches of snow	0
Soil Productivity and Soil Stability	Total area designated for OSV use	Acres open to cross-country OSV travel	1,147,825

Alternatives 2 - modified, 3, 4, and 5

Table 107 provides a summary of the alternatives proposed.

Table 107. Alternative comparisons

OSV Management	Alternative 1: No Action	Alternative 2: Modified Proposed Action	Alternative 3	Alternative 4	Alternative 5
OSV Use Allowed:					
Designated OSV areas (acres)	1,147,825 (open but no acres designated)	858,436	600,542	1,160,793	651,877
Designated OSV trails for grooming (miles)	203	203	273	750	200
Designated OSV trails- no grooming (miles)	24	90	0	0	5.2
Minimum Snow Depth (Inches):					
Cross-country travel	No minimum	12	18	12	24
Over existing trails	No minimum	Adequate snow on trails to avoid resource damage (typically 6 inches of snow or ice)	18	No minimum	12
Grooming of trails	12	12	12	No minimum	12

Minimization Measures; Project Design Features common to all action alternatives

Minimization measures, design features and best management practices (BMPs) would be used to minimize damage to soil resources including soils from the use of OSVs for all action alternatives. Volume II, Appendices D and E of the FEIS display the minimization criteria for the soil resource.

- Enforce the minimum snow depth requirements by issuing a citation if use is occurring in violation of the minimum snow depth requirements included as OSV use designation provisions (enforceable pursuant 36 CFR §261.14).
 - ♦ Soil and water resources would be protected by allowing OSV use to occur in designated areas and on designated trails only when there is adequate snow depth to prevent damage to soils and vegetation. Cross-country OSV use in designated areas would be allowed when there is 12 inches of snow or ice on the landscape. Adequate snow cover would prevent rutting of soils that can cause sedimentation and would prevent disturbance of stream banks. OSV use would not be designated over open or frozen water. BMPs presented in the 2012 USDA Forest Service National Core BMP Technical Guide would be implemented for all OSV use.
 - ♦ Meadows, wetlands and riparian areas would be protected by allowing OSV use to occur in designated areas and on designated trails only when there is adequate snow depth to prevent damage to soils and vegetation. Cross-country OSV use in designated areas would be allowed when there is 12 inches of snow or ice on the landscape.

- Grooming shall not occur when the ground surface is exposed and soil damage or rutting could occur. The operator shall consider recent, current, and forecasted weather and snow conditions to ensure these conditions are met.
- Initial grooming of trails (first grooming of the year) shall only occur when there is 18 inches or more of snow present to ensure that no contact with native soil or vegetation occurs or disturbance of the trail or underlying road surface. All subsequent grooming shall only occur when there is 12 inches or more of snow present.
- Typical grooming season is from December and continues through March. Start and stop times vary per trail location and are dependent upon the presence and depth of snow.
- Adhere to Best Management Practices related to Over Snow Vehicle Use from the 2012 USFS National Core BMP Technical Guide. (Volume II, Appendix C, of the FEIS).

Required Monitoring

The Forest Service has an obligation to monitor the effects of OSV use as required by Subpart C of the Travel Management Rule. Furthermore, as an ongoing component of the State-funded OSV program, California State Parks requires and provides funds to the Forest Service to monitor OSV trail systems for evidence of OSV trespass into areas not designated for OSV use, OSV use near or damage of sensitive plant and wildlife sites, and low snow areas subject to erosion.

Monitoring that would occur during implementation of any alternative related to the soil resource includes the following:

- During routine winter recreation field visits recreation and FPOs monitor OSV-use and document any signs of damage occurring to Forest Resources. The soil resource has defined “resource damage” and what to look for to signify that damage is occurring (Volume II, appendix J).
- Snow depth would be monitored during routine winter recreation field visits to ensure the minimum snow depth requirements are being met. Snow depth measurement locations and techniques would be developed using an interdisciplinary team approach and would consider terrain, season, and areas identified during the Minimization Criteria Screening Exercise as areas of concern (Chapter 2).
 - ♦ Staff conducting the monitoring would assess: (1) if the minimum snow depth requirements being met; (2) if resource damage is occurring (below, at, or above the minimum snow depth requirements; (3) the extent of any observed damage; (4) what, if anything, can be done to address use occurring on snow depths below the minimum snow depth requirements; and (5) snow depth monitoring will consider BMPs and will evaluate whether OSV use is impacting the roads, routes, or soils that underlie trail surfaces and OSV-use areas.

Direct and Indirect Effects

The potential direct and indirect effects for these alternatives are similar to the no-action alternative. However the no-action alternative has the potential to have the most impacts to the soil resource because it includes more acreage open to cross-country OSV use with no minimum snow depth required to travel cross-country or on trails. Additionally minimization criteria and project design features proposed here would not be implemented under the no-action alternative. No minimum snow depth could lead to localized soil disturbance where there is repeated use at lower snow depths under alternative 1. Under alternative 2 - modified, there is no minimum snow depth to use OSV on trails, but it is recommended that 6 inches of snow or ice be present prior to use in order to prevent resource damage. Alternative 4 has

no minimum snow depth prior to OSV use on trails, which could lead to localized soil disturbance where there is repeated use at lower snow depths. The effects of trail grooming would be similar to those effects described under the no-action alternative above, except under alternative 4, which has no minimum snow depth required prior to grooming trails.

Soil Productivity

Impacts of OSV use on soil productivity would be similar to the impacts described under the no-action alternative, but would occur on less acreage overall. No new trail or road construction would occur under any of the alternatives. Because OSV use would occur with sufficient amounts of snow to protect the soil resource, there would not likely be soil disturbance including compaction or effects to soil porosity or the disturbance of organic matter including forest floor litter and large woody debris present on the soil surface. During times of the year when snowpack is potentially more variable, there could be incidental indirect effects including some minor ground disturbance in low-snow areas.

Under action alternatives 2 - modified, 3, and 5, the acreage designated for OSV use on sensitive soils would be much less than under the no-action alternative and under alternative 4. Alternatives 3 and 5 would have the least potential for impact on sensitive soils, as the fewest acres of sensitive soils would be designated for OSV use (Alternative 3 - 64,855 acres; Alternative 5 – 65,723), and both alternatives have greater snow depth requirements prior to OSV cross-country travel (Alternative 3 – 18 inches; Alternative 5 – 24 inches). Not including the no-action alternative, alternative 4 would potentially have the greatest impacts, as the most acreage is designated for OSV use, with the most acres of sensitive soils also designated for OSV use, with no minimum snow depth prior to OSV travel on trails and no minimum snow depth prior to grooming trails.

Soil Stability

Impacts of OSV use on soil stability would be similar to the impacts described under the no-action alternative. OSV use would not increase landslide potential on low stability sites across the forest. Erosion would likely not increase with adequate snow cover under all the alternatives.

Table 108. Resource indicators and measures for alternatives 2 - modified, 3, 4 and 5 direct and indirect effects (a summary of sensitive soil types can be found in the soils specialist report)

Resource Element	Resource Indicator	Measure	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Soil Productivity and Soil Stability	OSV use on sensitive soils including meadows and areas with potential erosion hazards.	Acres of cross-country travel designated for OSV use on sensitive soils	144,660	64,855	255,914	65,723
Soil Stability	Minimum Snow Depths on trails	Inches of snow	Adequate depth to prevent resource damage (generally 6 inches)	18	0	12
Soil Productivity	Minimum snow depths for cross-country travel	Inches of snow	12	18	12	24

Resource Element	Resource Indicator	Measure	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Soil Productivity and Soil Stability	Total area designated for OSV use	Acres open to cross-country OSV travel	858,436	600,542	1,160,793	652,122

Cumulative Effects

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Cumulative effects include a discussion of the combined, incremental effects of human activities. For activities to be considered cumulative, their effects need to overlap in both time and space with those of the proposed actions. For the soil resource, the area for consideration is the whole project area.

Vegetation Management

Several current and future vegetation management activities are occurring in the Plumas National Forest. These ground-disturbing activities could have cumulative effects on the soil resource if the soil disturbance occurs in the same location as potential soil disturbance from OSV use. This is very unlikely, as effects of OSV use would be minimal throughout the forest. Potential road-building, reconstruction, decommissioning and maintenance activities associated with vegetation management activities could increase soil disturbance and decrease soil productivity and stability where the roads are located. These vegetation management activities are regulated by Forest Plan standards and guidelines, Regional Standards and best management practices to ensure soil productivity is maintained.

In general, snowmobiling is the primary winter recreational use in the action area. Snowmobiling primarily occurs on existing trails, naturally un-forested areas, or in areas with limited forest cover or associated structural complexity at the ground level. Because snowmobiles operate over snow that protects the ground, it is unlikely that OSV use has a significant direct impact upon soils, and therefore, cumulative effects are not expected.

Other Recreation Activities

Disturbance from general motorized use and recreational access occurs and will continue to occur throughout the forest indefinitely. We anticipate minimal changes in the existing recreation profile. Three recreational projects that are in progress include the realignment of 800 feet of the Mud Lake Trail; Rehabilitation of the Four Corners OHV Play Area, and construction of 0.95 mile of the Mills Peak Trail South. OSV use in these areas would occur with sufficient snow cover to protect the soil resource. Other recreational activities that take place off the developed roads, such as the gathering of miscellaneous forest products and hunting, occur within the project area, but because OSV use would generally occur on adequate snowpack, we anticipate no cumulative effects from other ongoing recreational activities.

Climate Change

Climate change affects and would continue to affect California and the Plumas National Forest in the future. Precipitation events would likely become more unpredictable and warmer temperatures would decrease the amount of precipitation that falls as snow, likely decreasing the total snowpack and the amount of time that snow would be on the ground (State of California 2007). This could potentially increase the amount of time the soil would be exposed to OSV impacts. Potentially, this could increase the impacts on sensitive soil sites including wet meadows and erosive sites because of increased soil exposure.

Summary of Environmental Effects

Table 109 summarizes the soil issue indicators and the potential effects to those indicators by alternative.

Table 109. Summary comparison of environmental effects to the soil resource

Resource Element	Indicator/ Measure	Alternative 1 (no action)	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Soil Productivity and Soil Stability	OSV use (acres) on sensitive soils including meadows and areas with potential erosion hazards.	There would be no change in acreage of area currently open to cross-country OSV travel on sensitive soils. Approximately 255,731 acres with mapped sensitive soil types are open to cross-country travel.	Approximately 144,660 acres of sensitive soils would be open to cross-country OSV travel within the Forest. This is less sensitive soils designated for OSV use than under the current management and under alternative 4, but it is greater than under alternatives 3 and 5.	Approximately 64,855 acres of sensitive soils will be open to cross-country OSV travel. Under this alternative, the least amount of sensitive soils will be open to OSV cross-country travel.	Approximately 255,914 acres of sensitive soils will be open to cross-country OSV travel. Under this alternative, there would be the most acreage of sensitive soils open to cross-country OSV travel, slightly greater than under the no action alternative.	Approximately 65,723 acres of sensitive soils will be open to cross-country OSV travel. Under this alternative, the acreage open to cross-country OSV use on sensitive soils is less than all other alternatives, other than alternative 3.
Soil Stability	Minimum snow depth on trails (inches)	There is no minimum snow depth required prior to any OSV travel over existing roads and trails or cross country. With no minimum snow depth, soil resource damage could occur where cross-country or trail OSV use occurs and snow levels are not sufficient to prevent contact with the soil or road. This could lead to increases in erosion where bare soil is exposed.	Minimum snow depth is the amount of snow necessary to adequately prevent resource damage. This is generally 6 inches of snow or ice prior to any OSV travel over existing roads and trails. This minimum snow depth 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. Monitoring of this snow depth is recommended to further evaluate the potential effects to soils.	Minimum snow depth is 18 inches of snow prior to any OSV travel over existing roads and trails. This minimum snow depth has been observed to be sufficient to prevent contact of OSVs with the bare soil surface.	There is no minimum snow depth required prior to any OSV travel over existing roads and trails or cross country. With no minimum snow depth, soil resource damage could occur where cross-country or trail OSV use occurs and snow levels are not sufficient to prevent contact with the soil or road. This could lead to increases in erosion where bare soil is exposed.	Minimum snow depth is 12 inches of snow prior to any OSV travel over existing roads and trails. This minimum snow depth has been observed to be sufficient to prevent contact of OSVs with the bare soil surface.

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Resource Element	Indicator/ Measure	Alternative 1 (no action)	Alternative 2 - Modified	Alternative 3	Alternative 4	Alternative 5
Soil Productivity and Soil Stability	Minimum snow depths for cross-country travel (inches)	There is no minimum snow depth required prior to any OSV travel over existing roads and trails or cross country. With no minimum snow depth, soil resource damage could occur where cross-country or trail OSV use occurs and snow levels are not sufficient to prevent contact with the soil or road. This could lead to long term decreases in soil productivity where snow depth is not adequate to protect the soil resource from compaction, rutting and/or displacement.	Minimum snow depth of 12 inches of snow for cross-country OSV travel would not change. Potential effects to the soil are unlikely to occur with at least 12 inches of snow covering the soil surface.	Minimum snow depth of 18 inches of snow for cross-country OSV travel would not change. Potential effects to the soil are unlikely to occur with at least 12 inches of snow covering the soil surface.	Minimum snow depth of 12 inches of snow for cross-country OSV travel would not change. Potential effects to the soil are unlikely to occur with at least 12 inches of snow covering the soil surface.	Minimum snow depth of 24 inches of snow for cross-country OSV travel would not change. Potential effects to the soil are unlikely to occur with at least 12 inches of snow covering the soil surface.
Soil Productivity and Soil Stability	Total acres designated for OSV use	Approximately 1,147,825 acres of the Forest are designated for OSV use. Under the no-action alternative, more acreage is designated for OSV use compared to all the other alternatives.	Approximately 858,436 acres of the Forest would be designated for OSV use. This is much less acreage designated for OSV use than under the no action alternative and under alternative 4, but would be a little more acres designated for OSV use than under alternatives 3 and 5.	Approximately 600,542 acres of the Forest would be designated for OSV use, which is the least amount of acres open to OSV compared to all the other alternatives.	Approximately 1,160,793 acres of the Forest would be designated for OSV use, which is the greatest number of acres designated for OSV use out of all of the action alternatives, but is slightly less than under the no action alternative.	Approximately 651,877 acres of the Forest would be designated for OSV use, which is less than all the other alternatives except alternative 3, which has slightly less acres designated for OSV use.

Hydrology

In this section, we analyze the impacts of over-snow vehicles (OSVs) on hydrologic resources resulting from the designation of trails and areas for OSV use and the identification of snow trails to be groomed for OSV use in the Plumas National Forest. The focus is on water quality and quantity changes that may result from the use of OSVs. OSV use has the potential to impact water and watersheds in several ways, including chemical contamination, ground surface disturbance, runoff timing, or altering stream side vegetation.

Methodology

This section describes the methodology used for the effects analysis for water resources. This section establishes indicators (table 110) chosen to measure potential effects, the analysis area, timeframe, methods used, and assumptions made for the effects analysis of all action alternatives on water resources.

As defined in the regulations for implementing NEPA, Code of Federal Regulations, Chapter 40, Sections 1500-1508, direct effects would be those effects caused by the proposed action (or action alternative) and which occur at the same time and place as the action. Indirect effects would be those caused by the action that are later in time or farther removed in distance from the location of the action.

We will analyze the direct and indirect effects and cumulative watershed effects for each of the action alternatives. Direct and indirect effects of each project alternative will be analyzed together. At the end of these analyses there is a summarized comparison of alternatives.

We used key indicators to summarize the direct and indirect effects of alternatives and compare them to the no-action alternative. A summary compares each alternative by the indicators, LRMP consistency, and consistency with the Federal Clean Water Act and the Porter-Cologne Water Quality Control Act.

Methodology and Information Sources

We used GIS data, a variety of reports and assessments of OSV impacts, and professional experience and judgement using scientific literature on OSV impacts for this analysis.

Incomplete and Unavailable Information

We performed no field observations or site-specific water quality or ground-disturbance monitoring for this analysis; and we conducted very little monitoring of snowmobile impacts on hydrology at specific sites in the Plumas National Forest. Plumas National Forest recreation staff monitor snowmobile and other winter recreation use in the forest, but no water quality sampling or hydrology assessments were made supporting this assessment of snowmobile impacts. We based assessments of OSV water quality impacts primarily on scientific literature.

Spatial and Temporal Context for Effects Analysis

The spatial and temporal bounds for discussing and analyzing direct, indirect, and cumulative effects on water resources and associated riparian areas and wetlands would be the watersheds within the Plumas National Forest.

Short-term effects would be generally up to 1 year in duration, and long-term effects would be more than 1 year in duration.

Table 110. Indicators used for the hydrologic analyses

Resource Indicator	Usefulness of Indicator Measure	Geographic Scales for Each Indicator Measure
Designated use area for OSV use	Impacts are widely dispersed and differences in alternatives are minor	Plumas National Forest
Minimum Snow Depth for OSV Use on Designated Trails (Inches)	Minimum snow depths on trails can be evaluated for effectiveness for protecting the trail surface	Plumas National Forest
Minimum Snow Depth for Cross-country OSV Use (Inches)	Minimum snow depths for cross-country travel can be evaluated for effectiveness for protecting the ground surface and vegetation	
Number of snowmobiles per year using trails across forest	Total amount of use can be compared to use amounts in Yellowstone and other studies to gauge potential water quality effects	
Consistency with Riparian Conservation Objectives 1, 2, 4, 5, and 6	Evaluation of the effects to RCAs, water quality and beneficial uses of water	

Note: The Sierra Nevada Forest Plan Amendment requires that Riparian Conservation Objectives analyses be conducted during environmental analyses for new proposed management activities within CARs and Resource Conservation Areas (Standard and Guideline 92). There would be no additional routes proposed for addition to the national forest transportation system within CARs in the analysis area. Consequently, consistency with the RCOs is an indicator to ensure that goals of Aquatic Management Strategy would be met (USDA FS PSW Region 2004: 32).

Analysis Assumptions

Assumptions used for the analysis are based on published literature and the hydrologist's professional judgement based on experience with the USDA Forest Service. These sources of information framed the key indicators used for analyzing the environmental consequences of each alternative on watershed resources. They provide background information and conclusions regarding the effects of OSVs and other factors considered in this analysis, and apply to the analysis of all alternatives. The key indicators are described and listed in table 110. For this plan, minimization criteria to protect water resources were developed and are designed to reduce or eliminate impacts to hydrology through project design features or mitigation measures.

Assumption 1: Snow Plowing and Removal

Snow removal at trailhead parking areas has been occurring for decades. Snow plowing and removal occurs on paved surfaces in snow parks and does not cause soil disturbance, alter existing drainage patterns, or affect soil permeability. This is because BMPs would be applied that ensure that snowmelt from snow storage areas does not result in erosion or impair quality of surface waters.

With implementation of BMPs, snow removal would not cause noticeable or measureable impacts from erosion. High runoff rates are uncommon from snow storage areas. The thaw rate in snow storage areas is typically slow, and snow is placed where the runoff percolates into the soil. As a result erosion or siltation from snow storage runoff is minimal.

The snow removal operations at trailhead parking areas would not result in direct impacts on water quality. Snowmelt from snow storage areas could contain a more concentrated level of fuel deposits, oils, sand, and particulates. However, this is mitigated because snow is removed to designated storage areas where the snow melt can percolate into the soil and sheet flow across parking areas is avoided. This snow disposal and storage method also allows avoidance of direct discharge into surface water. As a result, the

potential for water quality impacts associated with contaminants in the snow from plow equipment use is considered minimal.

Snow removal operations are subject to BMPs, which ensure compliance with Federal Clean Water Act requirements. Consequently, project activities including snow removal are consistent with Plumas National Forest LRMP watershed management standards and guidelines and management prescriptions.

This activity is not included in the proposed action, but is an ongoing and reasonably foreseeable future action that would be considered for cumulative effects.

Assumption 2: Trail Grooming

Trail grooming does not cause substantial impacts to water quality, perennial, intermittent or ephemeral streams, wetlands, or in other bodies of water. This is because the direct project activities of trail grooming occur over an existing road and trail network and do not alter landforms or result in significant soil disturbance that would change water flow patterns or quantities of surface water runoff.

Consequently, project activities including snow removal, trail grooming, and OSV travel on groomed trails are consistent with Plumas National Forest LRMP watershed management standards and guidelines and management prescriptions.

Assumption 3: OSV Use on Trails

For this analysis, OSVs include snowmobiles, snowcats, and other tracked vehicles designed for use over snow. Most OSV trails are snow-covered un-paved roads and trails. The primary pollutant of concern in forested environments is eroded sediment from unpaved roads, fill slopes, and cut slopes. According to West (2002), roads in forested lands are the largest source of potential non-point source pollution. Fine-grained sediment from roads and trails that reaches water bodies can potentially impair water quality.

However, OSV use would not impair water quality because much of the OSV use under this management strategy would occur on ungroomed or groomed trails where design features call for adequate snow cover, which would result in negligible potential for contact with bare soil, and practically no disturbance of trail and road surfaces. OSV use on the groomed trail system given adequate snow coverage would not cause substantial impacts to water quality in perennial, intermittent, or ephemeral streams, in wetlands, or in other bodies of water. Adequate snow depths are snow depths that provide sufficient depth to prevent resource damage including damage to underlying vegetation, soil or ground disturbance.

Assumption 4: Cross-country Off-trail Riding by OSVs.

Some researchers have found that snowmobiles can contribute to erosion of trails and steep slopes. The degree of potential erosion is dependent on site-specific factors such as slope, aspect, elevation, adjacent vegetation, level of use, and weather conditions. Olliff et al. (1999) found that if steep slopes are intensively used, snow may be removed and the ground surface exposed to extreme weather conditions and increased erosion by continued snowmobile traffic. Similar results could occur when snowmobiles use exposed southern exposures. OSV use in off-trail open riding areas where there is minimal snow cover or bare patches of ground could potentially result in destruction of vegetation, soil compaction, and erosion in areas of repeated and concentrated use.

However, with adequate snow depths, cross-country use of OSVs would have a negligible effect on ground disturbance that could lead to erosion and sedimentation in streams or other water bodies, and a negligible effect on vegetation, especially along streams and other water bodies. Adequate snow depths are snow depths that provide sufficient depth to prevent resource damage including damage to underlying vegetation, soil or ground disturbance.

Ground disturbance would be negligible because off-trail OSV use would generally be dispersed and would not result in high concentrations of OSV use on bare soil. Also, travel over bare soil can damage machines, so is generally avoided by operators. With adequate minimum snow levels, this management strategy would result in no more than incidental and localized soil erosion, and therefore, would not create water quality impacts to streams or water bodies by introducing sediment in water runoff.

Cross-country OSV use has the potential to affect woody riparian species by bending and breaking of branches by recreationists running over the branches (Neumann and Merriam 1972). This is most likely to occur with lower snow depths such as the beginning of the winter season and before sufficient snow has accumulated to protect vegetation, and during spring snowmelt. Regenerating timber could also be affected by bending and breaking of leaders with inadequate snow depth. However, vegetation trampling from snowmobiles and potential impacts to riparian resources from OSV use would be considered negligible with adequate snowpack coverage.

Widespread snow compaction from cross-country OSV use can affect melt patterns, and in turn, the hydrologic regime. Studies have found delayed snowmelt in areas compacted by snowmobiles versus areas of un-compacted snow (Keddy et al. 1979, Neumann and Merriam 1972). During spring snowmelt, these effects can reduce the ability of the snow to slow runoff. It is unknown how much OSV-related snow compaction would affect runoff rate and timing, but some studies suggest up to a 2-week delay. However, because snow compaction from off-trail cross-country use is currently not extensive on a watershed scale, measureable changes in hydrology are not expected.

When OSVs are operated on adequate snow depths, the effects of cross-country OSV use are consistent with the Plumas National Forest LRMP, including Riparian Conservation Objectives, watershed management standards and guidelines, and management prescriptions.

Assumption 5: Exhaust Emissions

Exhaust emissions deposited in the snowpack in the amounts anticipated in the Plumas National Forest from grooming equipment or OSVs on trails or OSVs traveling cross-country would be considered minor and currently do not functionally impair water quality of adjacent water bodies. In addition to exhaust emissions, grooming equipment and OSVs could potentially leave behind unburned fuel, lubrication oil, and other compounds on the top layers of snow. Some of the unburned hydrocarbons could accumulate on the snow surface and could eventually wash into streams and lakes. This could cause localized degradation of water quality.

Concentrations of pollutants from OSVs have been observed in snowmelt runoff (Arnold and Koel 2006, McDaniel and Zielinska 2014). Discharge from two-stroke snowmobile engines can lead to indirect pollutant deposition into the top layer of snow and subsequently into the associated surface and ground water (Adams 1975). Hagemann and Van Mouweik (1999) found that there is a potential risk to aquatic life from snowmobile emissions, but that the risk could not be quantified because of a current lack of water quality data. Adams (1975) showed that high concentrations of lead and hydrocarbons were found in pond water adjacent to snowmobile trails during the weeks following ice melt. The study also found that juvenile brook trout had increased hydrocarbon intake and reduced stamina, from surface water and food chain feeding.

Studies conducted in the Rocky Mountain region provide some indication of the potential effects of pollution deposition from OSV use. The U.S. Geological Survey monitored the snowpack throughout the northern Rocky Mountains over a period of several years to measure regional water quality trends as well as the effect of OSV use. The monitoring showed a relationship between OSV use and pollutant

deposition in the snowpack, but not more than negligible to minor quantities of OSV-related pollution in snowmelt. Detectable vehicle-related pollution in snowmelt was found to be in the range of background or near-background levels (Ingersoll 1999).

A study in Yellowstone National Park analyzed snowmelt from four test locations adjacent to roadways and parking lots heavily used by OSVs between Yellowstone's West Entrance at West Yellowstone, Montana, and the Old Faithful visitor area. No cross-country OSV use was allowed, and OSVs were concentrated on one main trail in to the park. The purpose of the study was to evaluate whether increased snowmobile use within the Park was creating increased potential for emissions to enter pristine surface waters. Specific objectives were to (1) examine snowmelt runoff for the presence of specific volatile organic compounds (VOCs), (2) determine if concentrations of any VOCs exceed safe drinking water criteria, and (3) predict the potential for impacts by VOCs on the fauna of streams near roads heavily used by snowmobiles in the park. In spring 2003 and 2004, water samples were collected and tested. In situ water quality measurements (temperature, dissolved oxygen, pH, specific conductance, and turbidity) were collected; all were found within acceptable limits. Five VOCs were detected (benzene, ethylbenzene, m- and p-xylene, o-xylene, and toluene). The very low concentrations were found to be below EPA criteria and guidelines for the VOCs analyzed and were below levels that would adversely impact aquatic ecosystems (Arnold and Koel 2006).

The number of snowmobiles entering Yellowstone in 2003 and 2004 was 47,799 and 22,423, respectively (Arnold and Koel 2006). The estimated seasonal day use of OSV Program trails across the Plumas National Forest is around 22,250 per year. These visitations are spread across multiple trailheads and trail systems and do not all occur in the same location. As a result, OSV seasonal use levels at any Plumas National Forest trailhead or trail system are considerably less than OSV use that occurred at Yellowstone National Park, and are considered very low.

Since Yellowstone OSV-use levels studied had not resulted in impaired water quality, due to much lower use numbers it follows that the OSV use in the project area from this management strategy would not adversely affect water quality of snowmelt. Therefore, due to very low concentrations of pollutants from OSV use, operation of OSVs on system trails and cross-country would be consistent with water quality objectives in the Plumas National Forest LRMP, including RCOs, watershed management standards and guidelines, and management prescriptions.

Assumption 6: Monitoring would occur as Prescribed

Although there would be no indicated adverse damage caused by OSV use to water resources, further monitoring and, if needed, implementing other protective measures would further ensure that aquatic resources are adequately protected. Possible protective measures include restricting access to aquatic communities where substantial impacts are observed through educational materials and signage, or if necessary, through the use of barriers or trail re-routes.

The annual OSV monitoring would include monitoring of streams and riparian systems, wetland, and other sensitive aquatic habitats occurring near the groomed trail system. The Forest Service water quality BMP 4-7 (USDA Forest Service 2000) would be followed for monitoring guidelines.

Assumption 7: Other Hydrologic Impacts

The management strategy as described in the action alternatives would not involve the construction of any structures which could impede or redirect flood flows, nor any ground surface modifications which could change drainage patterns, impervious surfaces, soil permeability, or other hydrological characteristics such as surface water volumes. The management strategy would not expose people or property to a risk of

flooding nor increase the risk of flooding for existing development in floodplains in the project area. The management strategy would not place housing or other structures within a flood hazard area. The management strategy would not involve a change in water use, affect a private or public water supply, or affect the quantity or quality of groundwater recharge, aquifer volume or cause a lowering of the local groundwater table level. The management strategy would not involve an increase in impervious surfaces. The management strategy would not involve discharges of storm water or wastewater.

Assumption 8: Equivalent Roaded Acre Model not Appropriate

The equivalent roaded acre (ERA) model (FSH 1990a: chapter 20) was not used for this analysis to show cumulative watershed effects. As long as adequate snow depths are maintained, because there are virtually no direct or indirect effects, using the ERA model would not show any detectable differences between alternatives for this management strategy and is not appropriate for this scale of analysis, which covers nearly a million acres.

The ERA model is beneficial at demonstrating changes in ERA for management strategies that intend to disturb hundreds to thousands of acres for fuels reduction, travel management, or timber harvest plans; or to show cumulative effects of wildfires. This management strategy would not create a new disturbance on the landscape for any alternative. Changing the overall acreage of areas open for OSVs would not lead to increases or decreases in ground disturbance as long as OSVs are managed appropriately. Finally, the ERA method would not show any detectable differences within the sixth field watersheds in this analysis.

Assumption 9: Global Climate Change

Global climate change is expected to substantially affect California over the next 50 years (<http://www.water.ca.gov/climatechange/docs/062807factsheet.pdf>). Precipitation is likely to become more variable from year to year. Warmer temperatures would reduce the proportion of precipitation that falls as snow and increase the proportion that falls as rain. This shift would result in higher peak flows, more frequent flooding, increased erosion, reduced summer base flows, more frequent droughts, and increased summertime stream temperatures.

These expected changes have several implications for OHV use effects on water resources on national forests:

- As floods become more frequent and of greater magnitude, roads and trails would likely be subjected to greater stresses from higher runoff. Erosion of route surfaces and route/stream crossings would become more common. Ephemeral channels would carry water more frequently than in the past.
- The role of roads and trails in increasing runoff and peak flows (Ziemer 1981, Jones and Grant 1996) would likely increase. Cumulative watershed effects in watersheds near their thresholds of concern may become more common.
- Protection and restoration of meadows and other riparian areas that extend the duration of base flows would be increasingly important as snowpack diminishes. Routes through riparian areas that are currently not causing resource damage could cause damage in the future as runoff becomes more extreme.
- Seasons of use for OSV routes may need to be modified as precipitation and temperature patterns change.

Assumption 10: Non-motorized Uses

For the purposes of this analysis, non-motorized uses have very little to no effect on hydrology and will not be considered further in this analysis.

Topics and Issues Addressed in This Analysis

Scope of Analysis

This hydrologic analysis includes all water resources that could be affected by the public's use of OSVs on trails and areas designated for OSV use and on groomed trails. This includes perennial and seasonal streams, lakes, ponds, vernal pools, meadows, wetlands, and springs.

Seasonal streams include intermittent and ephemeral streams. Ephemeral streams run for a short period of time with rainfall and snowmelt, whereas intermittent streams run for most of the year, except during times when water loss exceeds water availability in the channel. Vernal pools are seasonal ponds that usually develop during snowmelt and dissipate into the summer season.

Data Sources

Data on OSV routes and uses were compiled from geographic information systems data obtained from the Plumas National Forest, or from communication with forest recreation personnel or other specialists in the forest. Available scientific literature combined with an assessment of local conditions was used to assess snowmobile effects in the project area.

Purpose and Need

Part of the management strategy's purpose and need is to provide manageable, designated OSV system of trails and areas consistent with Travel Management Rule at 36 CFR part 212. To protect hydrologic resources, it would be important to ensure OSVs would be operated on sufficient snow depths, and to minimize impacts to natural and cultural resources. As an integral part of the development and analysis of the alternatives, the minimization criteria at 36 CFR §212.55(b) were used to compare and contrast alternatives as to how they would minimize damage to soil, watershed, vegetation, and other forest resources.

Affected Environment

Climate

Weather in the planning area follows a Mediterranean pattern of wet winters and dry summers. East of the Sierra crest, marine influence lessens and there is a greater range in daily and seasonal temperatures, lower precipitation and humidity, and rain from summer thunderstorms are normal. Most precipitation on both sides of the crest falls as winter frontal disturbances are lifted and cooled over the mountains (table 111).

Over 95 percent of the precipitation in the planning area occurs during winter months. Annual precipitation ranges from 30 to 40 inches on the east side of the Sierra crest, to as much as 70 inches in summit areas. Winter temperatures below 0 degrees Fahrenheit and summer temperatures above 100 degrees Fahrenheit have been recorded. Snowpack is common from December through May at elevations above 4,000 feet, although individual winter storms may bring rain to the highest elevations. Thunderstorms occasionally occur during the summer months, and most frequently on the east side of the range.

Hydrology

The OSV project area in the Plumas National Forest would be located in the Northern Sierra Nevada Range with the majority of activities occurring on the west side of the crest. There are many streams, lakes, and reservoirs within the project area. Many water bodies are directly accessed or crossed by OSV trails and many more can be accessed by OSVs going cross-country in areas designated for OSV use.

Table 111 summarizes the affected environment for water resources, which includes watershed areas on National Forest System lands. The Plumas National Forest is subdivided into 102 6th-level watersheds. The watershed average size is about 11,820 acres. The existing condition of watersheds (watershed health) in the forest varies depending upon amount of disturbance found within each watershed and the degree of natural integrity of the system. Disturbance in the form of land management activities, such as timber management, road construction, livestock grazing, mining, recreation, and special-uses have the potential to adversely affect a watershed's condition. Management activity effects are influenced in part by the local terrain, the precipitation regime, and other factors.

Watershed Condition

Streamflow in the planning area corresponds to seasonal precipitation, with low flows during summer and fall, and higher flows during winter and spring. Floods can occur throughout winter and spring, with large peak flows causing major flooding. Storm events that cause these peak floods occur approximately every 1 to 10 years. Warm mid-winter rainstorms on snowpack generate most large floods.

The watersheds of the planning area are composed of a variety of soil types that influence the timing of water movement to streams. Some soils contribute to rapid runoff and abrupt increases in stream flow during storm events. Other soils moderate runoff and streamflow. Shallow soils usually generate quicker winter and spring runoff than deeper soils do. Deep soils not only absorb and store more water than shallow soils, they also release more to summer flows. The deep soils of large alluvial areas, such as meadows, not only store and release water, but moderate high flows and increase late season flows (USDA Forest Service 1999).

A combination of road construction, soil compaction, ground cover reduction, and degradation of stream channels and riparian conditions has generated "accelerated over natural conditions" runoff and sediment yields from many watersheds (USDA Forest Service 1999). The percentage of land disturbed in Plumas National Forest watersheds has increased over the last two decades (USDA Forest Service 1999) as reflected in the reported increase in Equivalent Roaded Acres (ERA). The ERA measure is derived from site disturbance coefficients used to track general changes in hydrologic function of watersheds. The coefficients have been developed by comparing the effect of a land use activity to that of a road in terms of altering surface runoff patterns and timing.

Streams in the planning area range from high gradient (usually headwater channels that are sources and transporters of sediment, water, nutrients, and large wood), to low gradient channels (usually in riparian ecosystems), which can be very sensitive to changes in the amount of water and sediment delivered to them. Degradation of Sierra Nevada streams, and their aquatic and riparian ecosystems, has been linked to dams, reservoirs, water diversions, livestock grazing, invasive species, mining, water pollution, roads, logging, direct changes to stream channels and stream flows, and recreational and residential developments (USDA Forest Service 1999).

The low gradient channels of the east and central areas generally flow through large, wide meadows. On the west side, channels more often flow through narrow valley bottoms. Many meadow streams were once a braided network of shallow channels that overflowed their banks each year and covered the

meadows with water. The meadows remained wet most of the year, slowly releasing water to downstream reaches well into the dry season. Today, many of these meadow channels have been deeply gullied. Rather than holding water close to the surface of the meadow, gullied streams are deep and wide enough to contain most flood flows and subsequently drain much of the water from meadows early in the dry season. Through this process, wetland areas have evolved into dry lands that foster dry land conditions and species (USDA Forest Service 1999).

Table 111. Hydrologic characteristics of the OSV analysis area within the Plumas National Forest

Area	Characteristics
Landscape	Sierra Nevada Mountains, Plateaus and Canyons Elevation ranges between 8,400 feet and approximately 900 feet
Climate	Highly variable across Plumas National Forest due to elevation effect of Sierra Nevada Mountain Range. Most precipitation occurs between November and April. Winter precipitation below 3,500 feet is primarily rain and above 5,000 feet is primarily snow. Mean annual precipitation ranges between less than 25 inches at lower elevations to approximately 70 inches at the crest of the Sierra Nevada at Mt Ingalls.
Aquatic features	1,516 miles of perennial streams 9,086 miles of intermittent streams 52 lakes with total acreage of 2,121 acres, ranging between 4,071 acres to a few acres Over 200 meadows with total acreage of 4,286 acres, ranging between greater than 300 acres to less than 1 acres Vernal pools scattered throughout the Plumas National Forest
Beneficial Uses	Varies by watershed: municipal water supplies for domestic use, fire protection, hydropower generation, irrigation, contact and non-contact recreation, cold freshwater habitat, spawning habitat, stock watering, and wildlife habitat
Domestic use	Groundwater wells and surface water are used for domestic uses
Municipal Watersheds	All USFS Watersheds provide municipal water
Clean Water Act 303 (d) Water Bodies and Pollutant ^s	Lake Almanor, mercury; Concow Creek, Total Toxics; Dolly Creek, Metals; Fall River, Total Toxics; Middle Fork Feather River, Total Toxics; N. Fork Feather River, Mercury; S. Fork Feather River, Total Toxics; West Branch Feather River, Total Toxics; Little Grizzly Creek, Metals; New Bullards Bar Res., Mercury; Lake Oroville, PCB's; Sucker Run, Total Toxics; Yuba River, Mercury
Watersheds	102 sixth-field watersheds in the Plumas National Forest within the affected environment. Average size of entire watersheds (includes all ownerships): 11,820 acres Average watershed acreage within affected environment: 10,890 acres

Cal EPA CVWQCB 2014; Source: Cal EPA SWRCB 2006;

Surface Water

Approximately 1,516 miles (1,305.2 kilometers) of perennial rivers and streams flow through the Plumas National Forest. The forest also has 52 larger lakes and many smaller lakes, reservoirs, and ponds, and 4,286 meadow acres, ranging in size from less than an acre to over 300 acres. The hydrology of the project area is dynamic and evolving. There can be large annual variations in water availability and quality, seasonal flow rates, and water temperatures.

Precipitation and snow accumulation also can change over time as a result of climate change. Modern human activities have altered the natural dynamics of water through the construction of dams and diversions, watershed practices that alter water yields, temperature, sedimentation, and the introduction of pollutants and exotic biota. Surface waters in the forest originate as runoff from snowmelt and rainfall. Snowfall is generally the greatest contributor to total runoff, while intense rainfall events can cause the largest floods. The major runoff season in the forest is from April through June. Snowmelt runoff peaks usually occur from late May into June.

Major water bodies within the Plumas National Forest include the forks of the Feather River, Bucks Lake, Lake Almanor and Lake Oroville reservoirs, and headwaters of the Feather River. Water flowing from the forest in creeks and streams is vital for its fisheries, municipal and other water supply and other downstream uses.

Surface water quality

Located in high elevations of the Sierra Nevada Mountains, the project activities occur on snowpack forming the headwaters of many watersheds. These elevations generally produce surface water of excellent quality. Contaminant levels in most waters meet State standards and the fishable and swimmable objectives of the Federal Clean Water Act. Most pollutants where they may occur come from nonpoint sources, such as erosion from roads and parking areas. Sediment at levels above natural rates of erosion is the most common nonpoint source pollutant in forested ecosystems (USDA Forest Service 2001).

Quality of surface water is affected by the integrity of the fluvial system. Some concerns exist for watersheds where watershed impacts have affected water quality and stream channel potential, including riparian conditions and streambank stability. These effects would be in limited locations, and changes in management could improve existing conditions.

Section 305(b) of the Clean Water Act requires states to prepare and submit every two years a water quality summary report to the U.S. Environmental Protection Agency (EPA). In addition, Clean Water Act Section 303(d) requires states to submit to the EPA lists of water bodies that meet 303(d) listing criteria. This list identifies water quality-limited water bodies. Water quality impacts can be from point and/or nonpoint sources of pollution, and may require additional controls to meet state water quality standards. These water quality-limited water bodies are prioritized based on the severity of the pollution and other factors.

Surface water uses

Surface water from the forest is used both consumptively and non-consumptively. Uses in both categories depend on high-quality water. Non-consumptive water uses include recreation, wildlife, fisheries, and the aesthetic quality of this resource. Value in the forest is high for these uses. Much of the recreation use in the forest revolves around water bodies, including sightseeing, camping, fishing, and boating. Many campgrounds in the forest are located near lakes and streams.

Consumptive water uses include hydropower generation, fish hatcheries, downstream agriculture, road construction, fire protection, dust abatement, and special use permits. The Plumas National Forest contains municipal watersheds; however, they are not managed under any formal agreements. Consumptive use of water from lakes and streams for domestic purposes occurs in several areas.

Surface Water Protection Measures

Public water supplies are protected by the Safe Drinking Water Act, which was amended in 1996. The Safe Drinking Water Act does not require source areas to deliver water of potable quality with no need for treatment. In fact, waters in pristine areas usually need treatment due to natural waterborne parasites, such as giardia.

BMPs have been adopted to protect water quality in compliance with the Clean Water Act. BMPs cover a wide variety of land management actions on National Forest System lands, including watershed management, timber, transportation and facilities, pesticide-use, recreation, minerals, fish and wildlife habitat, fire suppression, and fuels management. When BMPs are properly applied, pollutant delivery to streams and lakes is minimal and recovery of waters and aquatic sites should be rapid. The physical, chemical, and biological integrity of waters in all watersheds should be as good as in watersheds that are managed exclusively for domestic and municipal supplies.

Groundwater

Rainfall and snowmelt, as well as producing surface runoff, also recharge groundwater sources in the forest. Groundwater aquifers release water during periods of low precipitation to maintain base flows of streams. Groundwater seeps and springs are in some cases vitally important in providing habitat for over-wintering salmon eggs and fry.

Groundwater is of beneficial use both on and off-forest, in the form of water supply wells. Communities use groundwater for part or all of their municipal water supply, while other residents use individual domestic wells. Consumptive use of groundwater in the forest is low. Such use is limited to special-use permittees and Forest Service campgrounds and administrative sites with domestic wells.

The existing condition of groundwater in the forest is good, although not all wells provide high-quality drinking water. Past management activities in the forest do not appear to have adversely affected groundwater quality. No groundwater contamination from recreation uses (toilets) has been recorded, with all road-accessible toilets being of the pump-vault type. Some potential for such ground water contamination exists at heavily used recreation sites with limited facilities.

Riparian Areas and Wetlands

In this analysis, riparian ecosystems, aquatic ecosystems, wetlands, lakeside zones, and floodplains will be jointly referred to as riparian areas. The terms riparian zones and riparian areas are used interchangeably, but by strict ecological definition, may not be the same in all instances.

Riparian areas are the transition zone between uplands and water in lakes and rivers. Riparian ecosystems are characterized by the presence of trees, shrubs, or herbaceous vegetation that require free or unbound water, or conditions that are wetter than those of surrounding areas. Riparian areas occur in stream corridors, along lakeshores, and around springs, wetlands, and wet meadows. Vegetation in riparian areas can include characteristic woody riparian hardwood types such as aspen, alder, or willow, or it can include larger and more vigorous trees of the same species as found on adjacent uplands.

The forest contains a variety of wetlands. Wetlands are defined in the 1987 Corps of Engineers Wetlands Delineation Manual (USDD Army Corps of Engineers 1989) as: “Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, fens, bogs, and similar areas.”

Riparian ecosystems are generally inclusive of wetlands. Healthy riparian areas, with an abundance of trees and other vegetation, slow flood waters and reduce the likelihood of downstream flooding. Riparian areas improve water quality by filtering runoff and sediment from flood flows and adjacent upland slopes. Healthy riparian areas act like a sponge, absorbing water readily during periods of excess. Water slowed by riparian areas enters the groundwater. Some of it is released later, increasing late summer and fall stream flow.

Fish depend upon healthy riparian areas to provide stable channels, sustained water supply, clean and cool water, food, and streambank cover. Riparian areas produce an abundance of stream cover and shade, which in turn limit the amount of water temperature fluctuation in the stream. This limiting in water temperature is generally advantageous to cold-water fish species.

Many animals visit and live in riparian areas. Benefits provided by riparian areas include food, cover, and nesting habitat for birds. They come for water, food, cover, and temperature moderation. Riparian areas often provide sheltered upstream and downstream transportation corridors for wildlife to other habitats.

Riparian areas are attractive and inviting to forest visitors. People often seek water and riparian environments for recreation activities. Management of riparian areas is considered in the context of the environment in which they are located, while recognizing their special values. Riparian-dependent resources include fisheries, stream channel stability, water quality, and wildlife.

OSVs often use existing roads and trails for snowmobile routes. The most serious impacts of roads and motorized trails in the Plumas National Forest occur where they are in close proximity to streams or wetlands within RCAs. Native surface roads and motorized trails within RCAs have the potential to impact water resources including water quality.

Environmental Consequences

The National Forest Management Act and the Clean Water Act provide direction for evaluating the direct, indirect and cumulative effects of proposed alternatives. National Forest Management Act requires that “soil, slope, or other watershed conditions would not be irreversibly damaged” and that protection is provided for streams, stream banks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment likely to seriously and adversely affect water conditions or fish habitat.

The Clean Water Act declares a policy to “restore and maintain” clean water and directs each state to adopt anti-degradation policies. The State’s anti-degradation policy (as described in the Water Quality Control Board’s basin plans and in waste discharge requirements) and implementation of Best Management Practices (BMPs) would safeguard existing water uses.

Effects Common to all Alternatives

Current and proposed winter recreation activities include non-motorized activities such as backcountry skiing and snowshoeing, and motorized activities such as private snowcats (Type 2 OSVs) and snowmobiling (Type 1 OSVs). Non-motorized effects would not have a measurable impact on hydrology.

Only the effects of motorized OSV activities are considered in the Environmental Consequences section of this report.

For all alternatives including the no-action alternative, OSV use would be allowed in the project area. A comparison of alternatives based on trails and areas designated for OSV use, and minimum snow depth for OSV use on trails and cross-country is shown in table 8. Effects common to all alternatives from OSV use are outlined in the assumptions in the previous section and include effects to water quality from OSV exhaust and lubricants, ground disturbance and snow compaction, and trampling of vegetation from OSV tracks.

All action alternatives provide restrictions on operation of OSVs over open or flowing water. This would prevent direct contact with water and the potential for ground disturbance near streams, channel disturbance, or lake bank disturbance.

Alternative 1 - No Action

The no-action alternative would be similar to the current use in terms of effects to hydrology. It would restrict OSV use to 1,147,825 acres of the Plumas National Forest, and would require no minimum snow cover on OSV trails that mostly overlie existing roads and trails. It would require no minimum snow cover for cross-country OSV use. For this analysis, it is assumed that BMPs regarding minimum snow levels and resource protection would continue to be applied (National Core BMP Rec-7. Over-snow Vehicle Use). BMPs would be applied to ensure that sufficient snow depth exists to protect the ground surface and riparian resources.

Table 112. Hydrologic resource indicators, alternative 1

Resource Indicator	Usefulness of Indicator	Alternative 1 Measure
Designated use area for OSV use	Impacts are widely dispersed and differences in alternatives are minor	1,147,825 acres
Minimum Snow Depth for OSV Use on Designated Trails underlain by roads or trails	Minimum snow depths on trails can be evaluated for effectiveness in protecting the trail surface	Not Specified
Minimum Snow Depth for Cross-country OSV Use	Minimum snow depths for cross-country travel can be evaluated for effectiveness in protecting the ground surface and vegetation	Not Specified
Number of snowmobiles per year using trails across forest	Total amount of use can be compared to use amounts in Yellowstone and other studies to gauge potential water quality effects	22,250
Consistency with Riparian Conservation Objectives 1, 2, 4, 5, and 6	Evaluation of the effects to RCAs, water quality and beneficial uses of water	Complies with RCOs 1,2,4,5,6

Direct and Indirect Effects

With application of resource protection BMPs, the effects of the No-action alternative 1 would have many of the same effects as alternative 2 - modified, except there would be a much higher number of acres open to OSVs. The minimum snow depth for use of OSV trails and cross-country travel would be not specified. Under this alternative, about 290,279 acres more National Forest System land (table 112) would be designated for OSV use compared to alternative 2 - modified. Because direct and indirect effects of this alternative would be negligible, having more acreage open to OSVs would lead to no increase in direct or indirect effects on hydrology.

Incidental direct effects including ground disturbance in low-snow areas may occur under this alternative, and because of the larger area open to OSVs as compared to alternatives 2 - modified, 3, and 5, incidental effects such as ground disturbance would occur over a larger area. One substantial difference in this alternative would be the higher amount of open area for OSV use. Because minimum snow levels under alternative 1 may be less than in alternative 2 - modified, there would be an elevated risk of ground disturbance and subsequent water quality impacts.

On areas with no specified minimum snow cover, snowmobile tracks could break through snowpack and churn soil, litter, or trail surfaces in to the snow, and create isolated ruts in the trail surface. This may occur because snowpack is not always evenly distributed, and snow can have highly variable density. Modern OSVs with deep lugs on their treads can easily displace 4 inches of snow each pass, depending on snow moisture amounts. Ruts could channel runoff from road or trail surfaces, potentially leading to stream sedimentation. Churned soil may get incorporated in runoff when snow melts.

Currently, there are no current forest-wide studies or monitoring information that can provide information on direct or indirect effects of the un-specified snow depth on trails or cross-country travel for this alternative. Snowmobile user web forums usually suggest about 6 inches as a minimum snow amount needed before snowmobile use (Snowmobile Forum 2008). Snowmobilers hesitate to operate machines on soil because it would damage their machines.

Overall, however, OSV use in alternative 1 would occur over a protective layer of snow, and direct and indirect effects to hydrology as a result would likely be isolated and incidental. Further, even for no minimum snow levels, this alternative has not resulted in more than incidental soil displacement or erosion and therefore would not create water quality impacts to streams or water bodies by introducing sediment in to water runoff.

With sufficient snow depths, OSV use on trails or in cross-country use areas would probably be consistent with the Plumas National Forest LRMP, including RCOs, watershed management standards and guidelines, and management prescriptions. Although adverse effects would not be expected, periodic monitoring would be required consistent with BMP 4-7 as a mitigation in areas with a not specified minimum snow depth to ensure there would not be impacts to the trail or other surfaces that could lead to stream sedimentation.

Much of the OSV use under this alternative would occur on trails where the management strategy calls for unspecified amounts of snow cover before OSV use can occur. This would result in potential for contact with bare soil and disturbance of trail and road surfaces. For OSV use on the groomed OSV trail system the not specified minimum snow level requirement would likely be adequate to protect trail surfaces. The unspecified minimum snow depth standard snow coverage for groomed OSV trails overlaying established roads and trails would likely be adequate to mitigate and eliminate substantial indirect water quality impacts such as stream sedimentation in perennial, intermittent, or ephemeral streams, in wetlands, or in other bodies of water. Monitoring would be required to verify adequacy of protection and Forest Plan compliance.

For the existing unspecified minimum snow levels for cross-country use, OSVs used for cross-country travel may result in more than incidental and isolated direct effects such as surface erosion of groomed trail surfaces, and therefore may create indirect water quality impacts to streams or water bodies by increasing sediment in water runoff. There would continue to be incidental and isolated ground contact in areas where OSVs operating cross-country could potentially contact the ground surface due to variations in snow depths, such as on high wind-exposed ridges and southern-facing slopes. However, off-trail OSV

use would be generally dispersed and would not result in a high concentration of ground disturbance from OSV use on bare soil. With adequate minimum snow levels, it is likely that current unspecified minimum snow depths would result in no more than incidental surface disturbance and soil erosion and therefore would not create water quality impacts to streams or water bodies by introducing sediment in water runoff.

Under alternative 1, cross-country OSV use would have the potential to directly affect woody riparian species by trampling, including bending and breaking of branches by OSVs running over vegetation. This would have the potential to directly affect shade along streams by reducing vegetation cover. Direct effects to vegetation probably would occur under alternative 1, but would likely be dispersed. Monitoring information is not available to determine the extent of impacts.

The direct effect of widespread snow compaction from cross-country OSV use under alternative 1 would create denser snow over a wider area that could lead to an indirect effect of slower snow melt rates, and could, in turn, indirectly affect the hydrologic regime by delaying snowmelt rates in localized areas. It is unknown how much OSV-related snow compaction would affect runoff rates and timing, and some studies suggest up to a 2-week delay in melting for heavily compacted snow such as on groomed OSV trails.

It is not expected that cross-country snowmobile use would heavily compact snow over large areas. Because the areal extent of snow compaction from cross-country OSV use combined with compacted snow on groomed trails would not be extensive on a watershed scale, measureable changes in hydrologic relationships would not be expected.

As described in the assumptions for this alternative, water quality effects from OSV exhaust hydrocarbon emissions stored in snowpack under alternative 1 would be negligible and not exceed water quality standards.

Under alternative 1, operation of OSVs on system trails and cross-country would likely be consistent with water quality objectives in the Plumas National Forest LRMP, including RCOs 1, 2, 4, 5, and 6, watershed management standards and guidelines, and management prescriptions if appropriate BMPs are applied.

The RCOs apply to all routes that pass through RCAs and meadows. Under alternative 1, groomed and ungroomed OSV trails and cross-country travel would be allowed within RCAs. Because there would be a layer of snowpack protecting the ground surface, there is a reduced resource damage potential. Although no restrictions on OSVs in riparian areas, lakes, or meadows are currently in place, no adverse impacts to these areas have been observed or monitored.

Consistency with Riparian Conservation Objectives

RCO 1 and 6: Under alternative 1, beneficial uses of water bodies would likely be protected and enhanced if BMPs are applied. There would be no changes in water storage, seasonal availability, or quality.

RCO 2, 4 and 5: Under alternative 1, the geomorphic and biological characteristics of meadows, streams, and RCAs would likely be protected if BMPs are applied. Because there would likely be no sedimentation, there would probably be no changes to aquatic primary productivity. Growing season water availability would remain unchanged and would not affect ecosystem integrity. Monitoring would be required to verify these impacts.

Required Monitoring

For unspecified minimum snow depths allowed on trails and cross-country areas, operation of OSVs should be monitored periodically. Monitoring would focus on whether OSVs are impacting soils or trail surfaces or vegetation in cross-country areas, and be reported to the forest or district hydrologist and soil scientist. If adverse effects are observed to occur on trails or in cross-country areas, OSV use should be discontinued. Monitoring would help ensure adverse effects are not occurring, and would reduce the risks of adverse effects by providing information on effects of snowmobile use.

Cumulative Effects – Alternative 1

Past, present, and reasonably foreseeable future projects in the project area include vegetation management, livestock grazing, prescribed burns, and recreation. There are many past, on-going, and reasonably foreseeable future projects identified in the Plumas National Forest that may be ground-disturbing and could potentially add sediment or other pollutants to surface waters within the forest. Wildfires are unforeseeable events that could directly impair water quality until vegetation recovers.

The risks of cumulative effects from this alternative would be negligible. As a result of the un-specified minimum snow depth for cross-country use, there would continue to be only incidental ground disturbance. As a result, there would likely be no change to equivalent roaded acres (ERA) calculations for any watersheds under this alternative, and no change in detrimental cumulative watershed effects. There would be negligible effects from exhaust emissions stored in snowpack, and low risk of damage to vegetation or other direct and indirect effects. However, this alternative would not implement the recommended project design criteria and mitigation measures, and would open the highest amount of land area to OSVs. This alternative would be consistent with Plumas National Forest LRMP standards and guidelines. This alternative would not result in irreversible or irretrievable effects to soil, water, or riparian resources.

Alternative 2: Modified Proposed Action

Measurements indicators for alternative 2 - modified are shown in table 113. Indicators focus on use levels and required snow depths needed for OSV use. Effects of the alternative depend in part on the amount of use by OSVs, and also on the effectiveness of required snow depths as a mitigation for anticipated effects of OSV use. For this analysis, it is assumed that BMPs regarding minimum snow levels and resource protection would be applied. BMPs would be applied to ensure that sufficient snow depth exists to protect the ground surface and riparian resources (National Core BMP Rec-7. Over-snow Vehicle Use)

Table 113. Hydrology resource indicators and measures for alternative 2 - modified

Resource Indicator	Usefulness of Indicator	Alternative 2 - modified Measure
Land area open for OSV use	Impacts are widely dispersed and differences in alternatives are minor	858,436 acres
Minimum Snow Depth for Public OSV Use on Snow Trails (Inches)	Minimum snow depths on trails can be evaluated for effectiveness in protecting the trail surface	6
Minimum Snow Depth for Public, Cross-country OSV Use (Inches)	Minimum snow depths for cross-country travel can be evaluated for effectiveness in protecting the ground surface and vegetation	12
Number of snowmobiles per year using trails across forest	Total amount of use can be compared to use amounts in Yellowstone and other studies to gauge potential water quality effects. There are 4 access points.	22,250
Consistency with Riparian Conservation Objectives 1, 2, 4, 5, and 6	Evaluation of the effects to RCAs, water quality and beneficial uses of water	Complies with RCOs 1,2,4,5,6

Direct and Indirect Effects – Alternative 2 - Modified

Under this alternative, OSV use would be designated on 858,436 acres. A 6-inch minimum snow depth for trails and a 12-inch minimum snow depth for cross-country use would likely be enough snow to protect soils and vegetation from resource damage from OSV use under most conditions.

Incidental direct effects including ground disturbance in low-snow areas could potentially occur under this alternative. Snowmobiles and other OSVs have low ground pressure. However, in some instances snowmobile tracks have the capacity to break through thinner snowpack and churn soil, litter or trail surfaces in to the snow, and create isolated ruts in the soil or trail surface. Churned soil may get incorporated in runoff when snow melts. For OSV use on trails under this alternative for a 6 inch minimum snow depth, there is low potential for contact with bare soil and practically no disturbance of trail and road surfaces expected. Most OSV use will be on snow over existing trails or roads.

For OSV use on the OSV trail system, a 6-inch minimum snow depth to protect soils from resource damage standard would likely be adequate to mitigate and eliminate substantial water quality impacts such as stream sedimentation in perennial, intermittent, or ephemeral streams, in wetlands, or in other bodies of water. For proposed minimum snow levels, no more than incidental and isolated direct effects such as soil erosion of groomed trail surfaces are expected, and therefore, no indirect water quality impacts to streams or water bodies by increasing sediment in water runoff.

Currently, there are no studies or monitoring information that can provide information on direct or indirect effects of the 12-inch snow depth for cross-country travel proposed for this alternative. Snowmobile user web forums usually suggest about 6 inches as a minimum snow amount needed before snowmobile use (Snowmobile Forum 2008). Snowmobilers hesitate to operate machines on soil because it would damage their machines.

Cross-country OSV use in open riding areas where there would be minimal snow cover or bare patches of ground could potentially result in direct effects including destruction of vegetation, soil compaction, and erosion in areas of repeated and concentrated use. However, with adequate snow depths, cross-country use of OSVs would have a negligible effect on ground disturbance leading to erosion and sedimentation in streams or other water bodies, and a negligible effect on vegetation, especially along streams and other

water bodies. It is assumed that the 12-inch snow depth proposed under this alternative under most circumstances would be adequate to protect vegetation and the ground surface from cross-country travel.

There has been and would continue to be incidental and isolated ground contact in areas where OSVs operating cross-country would contact the ground surface due to variations in snow depths such as on high wind-exposed ridges, and southern-facing slopes. Off-trail OSV use currently is generally dispersed and does not result in high concentration of ground disturbance from OSV use on bare soil. With adequate minimum snow levels proposed under this alternative, there would be no more than incidental or negligible surface disturbance and soil erosion, and therefore, would not create water quality impacts to streams or water bodies by introducing sediment in water runoff.

Overall OSV use in alternative 2 - modified would occur over a protective layer of snow, and direct and indirect effects to hydrology would likely be isolated and incidental. As a result, for proposed minimum snow levels, this alternative would not result in more than incidental soil displacement or erosion and therefore would not create water quality impacts to streams or water bodies by introducing sediment in to water runoff.

Cross-country OSV use has the potential to directly affect woody riparian species by trampling, including bending and breaking of branches by OSVs running over the branches. This has the potential to directly affect shade along streams by reducing vegetation cover. Direct effects to vegetation probably would occur under this alternative in isolated areas, but the effects would be limited or negligible by requiring 12 inches of snow cover before allowing OSV use.

Vegetation trampling from snowmobiles and potential impacts to riparian resources from OSV use would be considered negligible with adequate snowpack coverage, and no direct or indirect changes to vegetation would be expected from alternative 2 - modified. Riparian woody shrub species along stream courses would continue to be protected under most circumstances by the 12-inch snow cover requirement by limiting the direct physical trampling effect from snowmobiles on vegetation.

The direct effect of widespread snow compaction from cross-country OSV use can create more dense snow that leads to an indirect effect of slower melt rate, and could in turn indirectly affect the hydrologic regime by delaying snowmelt rates. It is unknown how much OSV-related snow compaction would affect runoff rate and timing, but some studies suggest up to a 2-week delay in snow melt rates from compacted snow. However, because snow compaction from off-trail cross-country use is currently not extensive, measureable changes in hydrology on a watershed scale are not expected.

Direct and indirect effects from overall numbers of OSVs can be used to gauge water quality effects. About 22,250 OSVs per year are currently using forest trails and would have access to cross-country use areas. OSV recreationists would be spread over several trailheads, so actual annual user numbers would be lower for a particular area. Studies on OSV impacts on water quality indicate that even at much higher use levels, there would be no adverse effects on water quality from OSV emissions. The number of snowmobiles that entered Yellowstone in 2003 and 2004 during key snowmobile use studies was 47,799 and 22,423, respectively. At Yellowstone, OSVs were confined to a few trails. This resulted in a much higher level of use compared to what is proposed in alternative 2 - modified. Since it was documented that the much higher Yellowstone OSV-use levels studied have not resulted in widespread impaired water quality, it follows that the lower overall OSV use in the project area for this alternative would not adversely affect water quality of snowmelt.

Unauthorized activities such as “water skipping” or trying to snowmobile across open water have been observed in some areas. These efforts are not always successful, resulting in snowmobiles abandoned in

lakes or other open water. This has the potential to increase effects to water quality from lubricants leaking into surface water, which can also affect aquatic biota. Similarly, during spring break-up, snowmobiles could cross open streams and other water bodies where snow cover is not present, which could result in the deposition of pollutants directly in stream courses and water bodies. Use of OSVs on open water or across flowing streams is prohibited under this alternative.

The authorized operation of OSVs occurs over a protective layer of snow, and direct and indirect effects to hydrology would be isolated and incidental. Furthermore, for proposed minimum operating snow depths, this alternative would not result in more than incidental soil erosion, and therefore, would not create water quality impacts to streams or water bodies by introducing sediment in to water runoff. Therefore, with adequate snow depths, OSV use on trails would be consistent with the Plumas National Forest LRMP, including RCOs, watershed management standards and guidelines, and management prescriptions. Adequate snow depths are snow depths that provide sufficient depth to prevent resource damage including damage to underlying vegetation, soil or ground disturbance.

Water quality effects from OSV exhaust stored in snowpack would likely be negligible and not exceed water quality standards. As a result, operation of OSVs on system trails and cross-country would be consistent with water quality objectives in the Plumas National Forest LRMP, including RCOs 1, 2, 4, 5, and 6, watershed management standards and guidelines, and management prescriptions.

The RCOs apply to all routes that pass through RCAs and meadows. Under alternative 2 - modified, groomed and ungroomed OSV trails and cross-country travel would be allowed within RCAs, but because of the layer of snowpack protecting the ground surface, there is currently a very low resource damage potential. Although no restrictions on OSVs in riparian areas, frozen lakes, or meadows are currently in place, no adverse impacts to these areas have been observed or monitored.

Required Monitoring

For the 12-inch minimum snow depths allowed in cross-country areas, and adequate snow cover on developed trails (typically 6 inches), operation of OSVs would be monitored periodically when use would be allowed at every site where these standards would be applied. Monitoring would be consistent with BMP 4-7, focus on whether OSVs are impacting trail surfaces, and be reported to the forest or district hydrologist and soil scientist. If adverse effects are observed to occur on trail surfaces, OSV use would be discontinued. Monitoring would help ensure adverse effects are not occurring, and would reduce the risks of adverse effects by providing information on effects of snowmobile use. Monitoring is recommended to include assessment of snow conditions at every OSV entry point onto the forest to assure adequate snow depth, especially in “shoulder” seasons during lower snowpack conditions.

The Forest Service uses BMPs in compliance with the Clean Water Act to minimize water quality impacts. BMPs are periodically monitored and rated for a variety of activities. Minimization criteria would also be applied to this alternative that minimize the effects to natural resources

Consistency with Riparian Conservation Objectives

RCO 1 and 6: Under alternative 2 - modified, beneficial uses of water bodies would be protected and enhanced. There would likely be no changes in water storage, seasonal availability, or quality.

RCO 2, 4 and 5: Under alternative 2 - modified, the geomorphic and biological characteristics of meadows, streams and RCAs would likely be protected. Because there would be no sedimentation, there would likely be no changes to aquatic primary productivity. Growing season water availability would remain unchanged and would not affect ecosystem integrity.

Cumulative Effects- Alternative 2 - Modified

Past, present, and reasonably foreseeable future projects in the project area include vegetation management, livestock grazing, prescribed burns, and recreation. There are many past, on-going, and reasonably foreseeable future projects identified in the Plumas National Forest that may be ground-disturbing and could potentially add sediment or other pollutants to surface waters within the forest. The Forest Service uses BMPs in compliance with the Clean Water Act to minimize water quality impacts. The Forest Service monitors roads and trails used by OSVs and implements BMPs to control erosion and other effects.

The risks of cumulative effects from this alternative are very low, because, as a result of the adequate snow depth on the trail and 12-inch minimum snow depth for cross country uses, there would continue to be only incidental ground disturbance, low risk of damage to vegetation or other direct and indirect effects. As a result, there would be no change to cumulative watershed effects or equivalent roaded acres (ERA) calculations for any watersheds under this alternative.

There would be negligible effects from exhaust emissions stored in snowpack. This alternative would implement the recommended project design criteria, BMPs and mitigation measures. This alternative would provide adequate snow cover to protect soils and water resources, and to protect vegetation in riparian areas. This alternative would be consistent with Plumas National Forest LRMP standards and guidelines, and would not result in irreversible or irretrievable effects to soil, water, or riparian resources.

Alternative 3

Alternative 3 would be similar to alternative 2 - modified in terms of effects to hydrology. It would restrict OSV use to 603,509 acres of National Forest System land, and would require 18 inches of snow cover over trails before OSV use. It would require an 18-inch minimum snow cover for cross-country OSV use. For this analysis, it is assumed that BMPs regarding minimum snow levels and resource protection would be applied. BMPs would be applied to ensure that sufficient snow depth exists to protect the ground surface and riparian resources (National Core BMP Rec-7. Over-snow Vehicle Use)

Table 114. Hydrology resource indicators, alternative 3

Resource Indicator	Usefulness of Indicator	Alternative 3 Measure
Designated use area for OSV use	Impacts are widely dispersed and differences in alternatives are minor	600,542 acres
Minimum Snow Depth for OSV Use on Designated Trails	Minimum snow depths on trails can be evaluated for effectiveness for protecting the trail surface	18 inches
Minimum Snow Depth for Cross-country OSV Use	Minimum snow depths for cross-country travel can be evaluated for effectiveness for protecting the ground surface and vegetation	18 inches
Number of snowmobiles per year using trails across forest	Total amount of use can be compared to use amounts in Yellowstone and other studies to gauge potential water quality effects	22,250
Consistency with Riparian Conservation Objectives 1, 2, 4, 5, and 6	Evaluation of the effects to RCAs, water quality and beneficial uses of water	Complies with RCOs 1,2,4,5,6

Direct and Indirect Effects – Alternative 3

The direct and indirect effects of alternative 3 would be similar to alternative 2 - modified. There would be fewer acres open to OSVs, however, and a higher degree of protection of ground surfaces from a higher minimum snowpack requirement. Under this alternative, about 262,000 fewer acres of National Forest System land would be designated for OSV use.

Because direct and indirect effects would be negligible, this alternative would result in minimal direct or indirect effects on hydrology. As in alternative 2 - modified, incidental direct effects including ground disturbance or vegetation trampling in low snow areas could potentially occur under this alternative. This alternative requires a minimum 18 inches of snow depth for cross-country OSV use and for use of OSV trails. It requires a minimum of 12 inches of snow before trails can be groomed.

Although adverse direct, indirect, or cumulative effects would be not expected, periodic monitoring should be required consistent with BMP 4-7 as a mitigation in areas with an 18-inch minimum snow depth to ensure there would not be impacts to the trail surface that could lead to stream sedimentation. Further, during low-snow conditions, monitoring should be required of trail conditions to ensure minimum snow depths before OSV use would be allowed. Monitoring should include assessment of snow conditions at every OSV entry point onto the forest to assure adequate snow depth, especially in “shoulder” seasons during lower snowpack conditions.

The RCOs apply to all routes that pass through RCAs and meadows. Under alternative 3, groomed and ungroomed OSV trails and cross-country travel would be allowed within RCAs, but because of the layer of snowpack protecting the ground surface, there is negligible resource damage potential. For this alternative OSV use is prohibited across open or flowing water, and no adverse impacts to these areas would be expected.

Consistency with Riparian Conservation Objectives

RCO 1 and 6: Under alternative 3, beneficial uses of water bodies would be protected and enhanced. There would be no changes in water storage, seasonal availability, or quality.

RCO 2, 4 and 5: Under alternative 3, the geomorphic and biological characteristics of meadows, streams, and RCAs would be protected. Because there would be no sedimentation, there would likely be no changes to aquatic primary productivity. Growing season water availability would remain unchanged and would not affect ecosystem integrity.

Required Monitoring

For the 18-inch minimum snow depths allowed on trails and cross-country areas, operation of OSVs would be monitored periodically when use would be allowed at every site where the 18-inch standard would be applied. Monitoring would be consistent with BMP 4-7, focus on whether OSVs are impacting trail surfaces, and be reported to the forest or district hydrologist and soil scientist. If adverse effects are observed to occur on trail surfaces or in cross-country riding areas, OSV use would be discontinued. Monitoring would help ensure adverse effects are not occurring, and would reduce the risks of adverse effects by providing information on effects of snowmobile use.

Cumulative Effects – Alternative 3

Past, present, and reasonably foreseeable future projects in the project area include vegetation management, livestock grazing, prescribed burns, and recreation. There are many past, on-going, and reasonably foreseeable future projects identified in the Plumas National Forest that may be ground-

disturbing and could potentially add sediment or other pollutants to surface waters within the forest. Wildfires are unforeseeable events that could directly impair water quality until vegetation recovers.

The risks of cumulative effects from this alternative would be negligible. As a result of the 18-inch minimum snow depth for cross-country use, there would continue to be only incidental ground disturbance. As a result, there would be no change to equivalent roaded acres (ERA) calculations for any watersheds under this alternative, and no change in detrimental cumulative watershed effects.

There would be negligible effects from exhaust emissions stored in snowpack, and low risk of damage to vegetation or other direct and indirect effects. This alternative would implement the recommended project design criteria and mitigation measures, and would open the lowest amount of land area to OSVs. This alternative would provide adequate snow cover to protect soils and water resources, and to protect vegetation in riparian areas. This alternative would be consistent with Plumas National Forest LRMP standards and guidelines. This alternative would not result in irreversible or irretrievable effects to soil, water, or riparian resources.

Alternative 4

Alternative 4 would be similar in part to alternative 1 and to alternative 2 - modified in terms of effects to hydrology. It would differ in that a larger area would be designated for OSV use (1,160,795 acres versus 1,147,825 acres in alternative 1 and 858,436 acres in alternative 2 - modified). Similar to current conditions, it would require no minimum amount of snow depth to avoid resource damage on trails, but require 12-inch snow cover minimum for cross-country OSV use similar to alternative 2 - modified. For this analysis, it is assumed that BMPs regarding minimum snow levels and resource protection would be applied. BMPs would be applied to ensure that sufficient snow depth exists to protect the ground surface and riparian resources (National Core BMP Rec-7. Over-snow Vehicle Use)

Table 115. Hydrology resource indicators, alternative 4

Resource Indicator	Usefulness of Indicator	Alternative 4 Measure
Designated use area for OSV use	Impacts are widely dispersed and differences in alternatives are minor	1,160,793 acres
Minimum Snow Depth for OSV Use on Designated Trails	Minimum snow depths on trails can be evaluated for effectiveness for protecting the trail surface	No Minimum
Minimum Snow Depth for Cross-country OSV Use	Minimum snow depths for cross-country travel can be evaluated for effectiveness for protecting the ground surface and vegetation	12 inches
Number of snowmobiles per year using trails across the forest	Total amount of use can be compared to use amounts in Yellowstone and other studies to gauge potential water quality effects	22,250
Consistency with Riparian Conservation Objectives 1, 2, 4, 5, and 6	Evaluation of the effects to RCAs, water quality and beneficial uses of water	Complies with RCOs 1,2,4,5,6

Direct and Indirect Effects – Alternative 4

The direct and indirect effects of alternative 4 would be similar as alternative 2 - modified. For alternative 4, trail use would have an unspecified minimum snow depth, and there would be increased acreage designated for OSV use. A much higher number of acres would be open to OSVs for cross-country travel. Under this alternative, about 296,000 acres more National Forest System land would be designated for

OSV use compared to alternative 2 - modified. Because direct and indirect effects of this alternative would be negligible, having more acreage open to OSVs would not lead to substantially more direct or indirect effects on hydrology. As in alternative 2 - modified, incidental direct effects including isolated and incidental ground disturbance in low snow areas could potentially occur under this alternative. As in alternative 2 - modified, this alternative would require a 12-inch minimum snow depth for cross-country OSV use. Like alternative 1, it would require no minimum snow depth for the use of trails by OSVs. BMPs would be applied to ensure that sufficient snow depth exists to protect the ground surface and riparian resources (National Core BMP Rec-7. Over-snow Vehicle Use). The National BMP for OSV uses states “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; use and enforce closure orders to mitigate effects when adverse effects to soil, water quality, or riparian resources are occurring.”

As described in alternative 2 - modified, incidental direct effects including ground disturbance in low-snow areas may occur under this alternative. Because of the larger area open to OSVs, incidental effects such as ground disturbance would occur over a larger area. One substantial difference in this alternative would be the increase in open area for OSV use.

On trails with no specified minimum snow cover, snowmobile tracks could break through snowpack and churn soil, litter, or trail surfaces in to the snow, and create isolated ruts in the trail surface. This may occur because snowpack is not always evenly distributed, and snow can have highly variable density. Modern OSVs with deep lugs on their treads can easily displace 4 inches of snow each pass, depending on snow moisture amounts. Ruts could channel runoff from road or trail surfaces, potentially leading to stream sedimentation. Churned soil may get incorporated in runoff when snow melts.

With sufficient snow depths to avoid adverse effects (National Core BMP Rec-7. Over-snow Vehicle Use), OSV use on trails would probably be consistent with the Plumas National Forest LRMP, including RCOs, watershed management standards and guidelines, and management prescriptions. Although adverse effects would not be expected, periodic monitoring would be required consistent with BMP 4-7 as a mitigation in areas with a not specified minimum snow depth to ensure there would not be impacts to the trail surface that could lead to stream sedimentation.

Much of the OSV use under this alternative would occur on trails where the management strategy calls for unspecified amounts of snow cover before OSV use can occur. This would result in potential for contact with bare soil and disturbance of trail and road surfaces. If BMPs are applied the unspecified minimum snow depth standard snow coverage for groomed OSV trails overlaying established roads and trails would likely be sufficient to mitigate and eliminate substantial indirect water quality impacts such as stream sedimentation in perennial, intermittent, or ephemeral streams, in wetlands, or in other bodies of water.

Although adverse direct, indirect, or cumulative effects would be not expected for cross-country travel, periodic monitoring should be required consistent with BMP 4-7 as a mitigation in areas with a 12-inch minimum snow depth to ensure there would not be impacts to ground surfaces that could lead to stream sedimentation. Further, during low-snow conditions, monitoring should be required of snow conditions before OSV use would be allowed. Monitoring should include assessment of snow conditions at every OSV entry point onto the forest to assure adequate snow depth, especially in “shoulder” seasons during lower snowpack conditions.

The RCOs apply to all routes that pass through RCAs and meadows. Under alternative 4, groomed and ungroomed OSV trails and cross-country travel would be allowed within RCAs, but because of the

required layer of snowpack protecting the ground surface, there would be very low resource damage potential. Although no restrictions on OSVs in riparian areas, lakes, or meadows are currently in place, no adverse impacts to these areas have been observed or monitored.

Required Monitoring

For the unspecified minimum snow depths allowed on trails and 12 inch minimum for cross-country areas, operation of OSVs would be monitored periodically when use would be allowed at every site where the minimum standard would be applied. Monitoring would be consistent with BMP 4-7, focus on whether OSVs are impacting trail surfaces or cross-country riding areas, and be reported to the forest or district hydrologist and soil scientist. If adverse effects are observed to occur on trail surfaces, OSV use would be discontinued. Monitoring would help ensure adverse effects are not occurring, and would reduce the risks of adverse effects by providing information on effects of snowmobile use.

Consistency with Riparian Conservation Objectives

RCO 1 and 6: Under alternative 4, beneficial uses of water bodies would be protected and enhanced. There would be no changes in water storage, seasonal availability, or quality.

RCO 2, 4 and 5: Under alternative 4, the geomorphic and biological characteristics of meadows, streams and RCAs would be protected. Because there would be no sedimentation, there would likely be no changes to aquatic primary productivity. Growing season water availability would remain unchanged and would not affect ecosystem integrity.

Alternative 5

Overall, alternative 5 would be similar to alternative 2 - modified in terms of effects to hydrology. It would differ in that it would decrease areas designated for OSV use to 651,877 acres of National Forest System land. It would require at least 12 inches of snow on designated OSV trails, and would require a 24-inch snow cover minimum for cross-country OSV use, and 12 inches of snow cover before grooming of trails could occur. For this analysis, it is assumed that BMPs regarding minimum snow levels and resource protection would continue to be applied. BMPs would be applied to ensure that sufficient snow depth exists to protect the ground surface and riparian resources (National Core BMP Rec-7. Over-snow Vehicle Use)

Table 116. Hydrology resource indicators, alternative 5

Resource Indicator	Usefulness of Indicator	Alternative 5 Measure
Designated use area for OSV use	Impacts are widely dispersed and differences in alternatives are minor	651,877 acres
Minimum Snow Depth for OSV Use on Designated Trails	Minimum snow depths on trails can be evaluated for effectiveness for protecting the trail surface	12 inches
Minimum Snow Depth for Cross-country OSV Use	Minimum snow depths for cross-country travel can be evaluated for effectiveness for protecting the ground surface and vegetation	24 inches
Number of snowmobiles per year using trails across the forest	Total amount of use can be compared to use amounts in Yellowstone and other studies to gauge potential water quality effects	22,250
Consistency with Riparian Conservation Objectives 1, 2, 4, 5, and 6	Evaluation of the effects to RCAs, water quality and beneficial uses of water	Complies with RCOs 1,2,4,5,6

Direct and Indirect Effects – Alternative 5

The direct and indirect effects of alternative 5 would be similar as for alternative 2 - modified, however the approach for alternative 5 is more conservative in that less acres are open. Under this alternative, about 212,949 acres less National Forest System land would be designated for OSV use compared to alternative 2 - modified. Because direct and indirect effects of this alternative would be negligible, having less acreage open to OSVs under this alternative would decrease further any risk of direct or indirect effects on hydrology. As in alternative 2 - modified, incidental direct effects may occur such as isolated ground disturbance in low snow areas under alternative 5. Unlike alternative 2 - modified, this alternative would require a minimum 24 inches of snow depth for cross-country OSV use. Similar to alternative 2 - modified, it would require a 12-inch minimum snowpack for OSV use on all trails. Mitigations for this alternative that could affect watershed condition were addressed in the Minimization Criteria Screening Exercise (Appendices D and E) of the FEIS.

As in alternative 2 - modified, although adverse direct, indirect, or cumulative effects would be not expected, periodic monitoring would be required consistent with BMP 4-7 as a mitigation in areas with a 12- and 24-inch minimum snow depth to ensure there would not be impacts to the trail surface that could lead to stream sedimentation.

The RCOs apply to all routes that pass through RCAs and meadows. Under alternative 5, groomed and ungroomed OSV trails and cross-country travel would be allowed within RCAs, but because of the layer of snowpack protecting the ground surface, there is a very low resource damage potential. Although no restrictions on OSVs in riparian areas, lakes, or meadows are currently in place, no adverse impacts to these areas have been observed or monitored.

Consistency with Riparian Conservation Objectives

RCO 1 and 6: Under alternative 5, beneficial uses of water bodies would be protected and enhanced. There would be no changes in water storage, seasonal availability, or quality.

RCO 2, 4 and 5: Under alternative 5, the geomorphic and biological characteristics of meadows, streams and RCAs would be protected. Because there would be no sedimentation, there would likely be no changes to aquatic primary productivity. Growing season water availability would remain unchanged and would not affect ecosystem integrity.

Required Monitoring

For the 12-inch minimum snow depths allowed on trails, operation of OSVs would be monitored periodically when use would be allowed at every site where the 12-inch standard would be applied. Monitoring would be consistent with BMP 4-7, focus on whether OSVs are impacting trail surfaces, and be reported to the forest or district hydrologist and soil scientist. If adverse effects are observed to occur on trail surfaces, OSV use would be discontinued. Monitoring would help ensure adverse effects are not occurring, and would reduce the risks of adverse effects by providing information on effects of snowmobile use.

Cumulative Effects – Alternative 5

Past, present, and reasonably foreseeable future projects in the project area include vegetation management, livestock grazing, prescribed burns, and recreation. There are many past, on-going, and reasonably foreseeable future projects identified in the Plumas National Forest that could be ground-disturbing and could potentially add sediment or other pollutants to surface waters within the forest. Wildfires are unforeseeable events that could directly impair water quality until vegetation recovers.

The risks of cumulative effects from this alternative would be negligible. As a result of the 24-inch minimum snow depth for cross-country use, there would continue to be only incidental ground disturbance. As a result, there would be no change to equivalent roaded acres (ERA) calculations for watersheds under this alternative, and no change in detrimental cumulative watershed effects.

There would be negligible effects from exhaust emissions stored in snowpack, and low risk of damage to vegetation or other direct and indirect effects. This alternative would implement the recommended project design criteria and mitigation measures, and would open the highest amount of land area to OSVs. This alternative would provide adequate snow cover to protect soils and water resources, and to protect vegetation in riparian areas. This alternative would be consistent with Plumas National Forest LRMP standards and guidelines. This alternative would not result in irreversible or irretrievable effects to soil, water, or riparian resources.

Conclusions

All alternatives would protect water resources, including the no-action alternative.

Action Alternatives 3 and 5 would best protect water resources:

For the 12- to 18-inch minimum snow amounts on the OSV trail system and 18- to 24-inch minimum for cross-country uses, the minimum snow coverage standards would likely be adequate to mitigate and eliminate substantial water quality impacts such as stream sedimentation in perennial, intermittent, or ephemeral streams, in wetlands, or in other bodies of water. Alternative 5 has fewer acres designated for OSV use than the other alternatives, except for alternative 3. The primary emphasis is that these alternatives call for a consistent 12 inches or higher minimum snow depth for trails and cross-country uses, which would help ensure adequate snow cover for OSV use and prevent adverse resource impacts. Mitigations for these alternatives that could affect watershed condition were addressed in the Minimization Criteria Screening Exercise (Appendices D and E) of the FEIS.

This alternative and the other alternatives would have a negligible impact on water quality as a result of hydrocarbon emissions from OSVs. This alternative and the other alternatives would be consistent with the Clean Water Act and Porter-Cologne Water Quality Control Act as water quality would not be impaired and beneficial uses would be protected.

There would be no watersheds with an increased risk of cumulative watershed effects as result of these alternatives, and they would be consistent with all of the applicable RCOs in the 2004 Sierra Nevada Forest Plan Amendment.

Beneficial uses would be protected because 12-inch or higher snow depths would be maintained on trails and at least an 18-inch minimum for cross-country OSV uses, reducing the risks of ground disturbance.

Action Alternatives 2 - modified and 4 would do the second best job at protecting water resources:

For OSV use on the OSV trail system, the ungroomed 6-inch minimum snow depth standard and unspecified minimum snow coverage for trails in alternatives 2 - modified and 4, if carefully enforced, would be adequate to mitigate and eliminate substantial water quality impacts such as stream sedimentation in perennial, intermittent, or ephemeral streams, in wetlands, or in other bodies of water. All action alternatives require snowpack adequate to avoid resource damage. Snow cover assessments would be particularly more important to do early and late in the OSV season. Both alternatives require 12 inches of minimum snowpack before cross-country use. Consistent and timely monitoring would be

needed for all alternatives as a mitigation to ensure that damage to trails or cross-country areas would not occur.

These alternatives would have a negligible impact on water quality as a result of hydrocarbon emissions from OSVs. Beneficial uses of water bodies would be protected under these alternatives. As a result, alternatives 2 - modified, 3, 4, and 5 would be consistent with the Clean Water Act and Porter-Cologne Water Quality Control Act as water quality and beneficial uses would be protected. There would be no watersheds with a risk of cumulative watershed effects as result of these alternatives, and these alternatives would be consistent with applicable RCOs in the 2004 Sierra Nevada Forest Plan Amendment.

Riparian Conservation Objectives (RCO) Analysis

The Sierra Nevada Forest Plan Amendment (SNFPA FSEIS ROD) requires that RCO analysis be conducted during environmental analysis for new proposed management activities within Critical Aquatic Refuges CARs and Riparian Conservation Areas (RCA) (Standard and Guideline #92). Consistency with the RCOs is an indicator to ensure that goals of the Aquatic Management Strategy (AMS) would be met (USDA FS PSW Region 2004: 32).

For this management strategy, allowing use of over-snow vehicles when the ground would be covered with a protective layer of snow would have a negligible effect on RCAs because direct and indirect effects would be negligible, and OSV use would result in negligible effects to RCAs. Hydrocarbon pollution derived from OSVs and grooming equipment would have a negligible effect on water quality under this management strategy.

The above determinations are based on Standard and Guideline #92, which states “Evaluate new proposed management activities within CARs and RCAs during environmental analysis to determine consistency with the RCOs at the project level and the AMS goals for the landscape.” Consequently, consistency with the RCOs is an indicator to ensure that goals of the AMS would be met (USDA FS PSW Regulation 2004: 32).

Indicator: consistency with Riparian Conservation Objectives 1, 2, 4 and 5 (Alternatives 2, 3, 4, and 5)

The RCOs apply to all routes that pass through RCAs and meadows. Over-snow vehicles would traverse meadows and streams in areas designated for cross-country OSV use with no restriction. Snow cover would protect these resources, and OSV trails in some areas would be located in RCAs.

RCO 1: Under alternatives 2 - modified, 3, 4, and 5 beneficial uses of water bodies would be protected. OSV use would not impact beneficial uses of water bodies, especially municipal watersheds. Beneficial uses within the major hydrologic areas, units, or creeks in the Plumas National Forest, designated by the State Regional Water Quality Control Board, have been identified. OSV use would not impact Clean Water Act 303(d) water bodies.

RCO 2: Under alternatives 2 - modified, 3, 4, and 5 the geomorphic and biological characteristics of meadows, perennial streams and RCAs would be protected. Under this RCO, the goal is to maintain or restore: (1) the geomorphic and biological characteristics of special aquatic features, including lakes, meadows, bogs, fens, wetlands, vernal pools, springs; (2) streams, including in-stream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species. For these alternatives, criteria for establishing consistency are that OSV use would not cause accelerated erosion, such as head-cutting or the formation of gullies in meadows or

spring ecosystems. Current OSV use does not lower water tables of meadows, and does not alter the movement of surface water in meadows. OSV use does not de-water spring ecosystems, does not capture streams and divert them down roads, and does not disturb shorelines of natural and man-made lakes and ponds.

RCO 4: Under alternatives 2 - modified, 3, 4, and 5, management activities within RCAs would enhance or maintain physical and biological characteristics associated with aquatic and riparian-dependent species. For these alternatives, criteria for establishing consistency are that OSV use does not degrade the water quality of hydrologically connected systems, and that OSV use does not modify channel morphology of streams.

RCO 5: Under alternatives 2 - modified, 3, 4, and 5, efforts would be made to preserve, restore, or enhance special aquatic features, such as meadows, lakes, ponds, bogs, fens, and wetlands, to provide the ecological conditions and processes needed to recover or enhance the viability of species that rely on these areas.

Consistency with Plumas National Forest LRMP and Other Relevant Laws, Regulations, Policies and Plans

All alternatives would comply with the Plumas National Forest Land and Resource Management Plan (LRMP), which provides standards and guidelines for water-related concerns. The 2004 Sierra Nevada Forest Plan Amendment modified the LRMP guidance.

All alternatives would be consistent with the Clean Water Act and Porter-Cologne Water Quality Control Act as water quality and beneficial uses would be protected. The alternatives would be consistent with all applicable RCOs in the Sierra Nevada Forest Plan Amendment once mitigation measures have been implemented. Beneficial uses of water bodies and water quality would be protected for all alternatives. Physical and biological properties of RCAs would be protected for all alternatives.

All alternatives would comply with the 2004 Sierra Nevada Forest Plan Amendment. The RCOs apply to all routes that pass through RCAs and meadows. Under all alternatives, groomed and ungroomed OSV trails and cross-country travel would be allowed within RCAs, but because of the layer of snowpack protecting the ground surface, there would be very low resource damage potential. Although no restrictions on OSVs in riparian areas, lakes, or meadows are currently in place, no adverse impacts to these areas have been observed or monitored.

Consistency with Riparian Conservation Objectives

RCO 1 and 6: Under all alternatives, beneficial uses of water bodies would be protected and enhanced. There would be no changes in water storage, seasonal availability, or quality.

RCO 2, 4 and 5: Under all alternatives, the geomorphic and biological characteristics of meadows, streams and RCAs would be protected. Because there would be no sedimentation, there would likely be no changes to aquatic primary productivity. Growing season water availability would remain unchanged and would not affect ecosystem integrity.

This project would comply with the Clean Water Act as enforced through the Porter-Cologne Water-Quality Act for the State of California.

Project Design Features

Mitigations and project design features for this alternative that could affect watershed condition were addressed in the Minimization Criteria Screening Exercise (Appendices D and E) of the FEIS.

Short-term Uses and Long-term Productivity

There would be no impacts from short-term uses and long-term productivity on hydrologic resources resulting from any alternative.

Unavoidable Adverse Effects

There would be no unavoidable adverse effects resulting from any alternative.

Irreversible and Irretrievable Commitments of Resources

There would be no irreversible or irretrievable commitment of resources resulting from any alternative.

Cultural Resources

This analysis will consider and disclose potential effects to cultural resources that could result from the proposed actions including designating trails and cross-country areas for Over Snow Vehicle (OSV) use under subpart C of the Forest Service's Travel Management regulations (36 CFR part 212).

Methodology

Existing data for cultural resources in the Plumas National Forest is available from cultural resource site atlases, historic archives including literature and early maps, site record files and past archaeological survey reports, as well as GIS spatial layers. In particular, information obtained from previous archaeological inventories of off-highway vehicle routes have proven useful to identify cultural resources in the area of potential effect (APE) that may have direct, indirect, or cumulative effects as a result of past and present OSV use. Consultation with Indian tribes, tribal organizations and knowledgeable individuals has also provided critical information on places and/or landscapes of importance to Native Americans.

Analysis Assumptions

The Plumas National Forest has had an active heritage (cultural) resource management program since the mid-1970s. Thousands of acres have been surveyed for cultural resources over the last 40 or more years. An array of cultural resource properties have been identified and recorded in that time and reports pertaining to these inventory efforts and records specific to the sites discovered are retained by the Forest. At no point, based on all of the information readily available, has any documented adverse effect to archaeological sites, features, or objects or to historic buildings and/or structures, been documented that have been the result of lawful and reasonable use of OSVs. There is, however, a greater potential for adverse effect to places important to the living Native American community (i.e., sacred places, traditional cultural properties, etc.) that we as Federal cultural resource managers might not be aware of. Identification of any impacts or conflicts would presumably become more readily apparent through tribal consultation efforts rather than any form of archaeological field inventory.

The assumptions used in this effects analysis are as follows:

- Snowpack can create a protective barrier between OSVs and cultural resources for cross-country use when snow depth levels are at or greater than 12 inches (Regional Heritage PA, appendix E, Stipulation 2.1(b)).

- Groomed trails overlaying paved, gravel or other roads with other base material serve as a cap for cultural resources that are bisected by such a road providing protection from adverse effects (Regional Heritage PA, appendix E, Stipulation 2.1(c)).
- Groomed trails overlaying maintained non-surfaced designated system roads with 6 or more inches of snow depth would not result in adverse effect so long as travel was confined to pre-existing developed routes (Regional Heritage PA, appendix D, Stipulation 2.2(d)).
- OSV trails that do not overlay any kind of system road or trail maintained by the forest and would potentially be used with less than 12 inches of snow depth should be examined for potential adverse effect to cultural resources prior to authorizing such activities.

Spatial and Temporal Context for Effects Analysis

Analysis of the duration of impacts to cultural resources is required under NEPA but is not required and is not usually considered in assessing effects under Section 106 of the National Historic Preservation Act. This is because, unlike most other types of resources, cultural resources are non-renewable resources – such resources are either adversely effected by an undertaking or they are not. Damage or destruction to cultural resource properties is nearly always permanent and irreversible although there can be occasional exceptions.

The primary means of presenting an effects analysis for historic properties is within the context of meeting NRHP eligibility criteria and retaining sufficient integrity to convey significance. The ability of historic properties to convey significance will often depend on their defined associations and context in relationship to the larger cultural/historical landscape as much as their own inherent characteristics. Activities or actions that occur beyond the physical boundaries of a historic property can still potentially result in adverse effects to it.

Affected Environment

The Plumas National Forest has recorded 5,584 cultural resource sites as of 2018. These include an array of prehistoric and historic archaeological sites, historic buildings and structures, and traditional cultural properties. A brief summary is provided below:

Pre-Contact/Prehistoric Period

Research indicates that humans have been present within the confines of the Forest for at least 8,000 years, very possibly earlier, with intensification – an apparent acceleration of use and population levels beginning about 4,000 to 5,000 years ago (before present – BP). The ancient peoples of Northeastern California were mobile and used different eco-zones at various periods during the year. Higher elevation locations were conducive to use beginning in late spring and extending through the fall. Winters would be spent in the lower elevation valleys. In the late prehistoric period, increased sedentary pattern with permanent villages in American and Indian Valleys as well as along the lower elevations on the west side of the Forest.

Cultural resource sites associated with the pre-contact (pre-1850) past are common in the Forest. Sites include major habitation areas with semi-subterranean house-pits and, occasionally, ceremonial roundhouses as well; temporary encampments that can range from ephemeral use sites to strategic locations that were used seasonally year after year; resource collection areas that might be focused on fishing, hunting, processing plant based resources or lithic procurement (i.e., quarries); or sites of a religious or spiritual association such as rock art locations. All of these classes occur in the Plumas National Forest. These are most often recognized by the presence of features such as the aforementioned

evidence of houses, bedrock mortars or grinding slicks. Most are recorded as occurrences of lithic artifacts including projectile points (for arrows, darts and/or spears), shaped flaked-stone tools (knives, scrapers and choppers) and the waste material from the manufacture, modification and maintenance of said tools. Ground-stone is also relatively common which consist of pounding or milling tools like hand-stones or pestles and occasionally portable stone mortars as well.

Ethnography

Four Tribes had territory within all or part of the Plumas National Forest at the outset of the California Gold Rush. The influx of Euro-Americans resulted in massive and traumatic changes in their respective lifeways. Three of these are Maiduan peoples speaking a different but closely related language and sharing many, although not all, cultural traits. The Nisenan held territory at the southern end of the Forest in the Yuba River area. The Konkow Maidu were present in the western part of the Forest and had territory well up into the Feather River Canyon. The Mountain Maidu held much of the rest of Plumas County and a significant portion of southern Lassen County as well. The fourth tribe, the Washoe, are separate from the other three and spoke a very different language. The Washoe held a large territory within the Great Basin but also had some of their westernmost traditional lands at the southeastern end of the Forest, particularly in eastern and southern margins of Sierra Valley. The Washoe made forays deeper into the northwest and encountered the Mountain Maidu on a frequent basis. A fifth tribe, the Paiute—another Great Basin tribe—also made forays into the northeastern end of the Forest but did not hold territory here in late pre-contact times.

In each case these tribes consisted of a numerous autonomous groups who would generally be associated with a particular home base and would interact cooperatively with one another on a frequent basis. They took advantage of a wide array of resources by maintaining a high degree of seasonal mobility. Fishing, seed and acorn gathering, hunting of both small and larger game as well as waterfowl, were all skills that were highly developed. Basketry was important as was the use of skins, hides, bone and shell used for utility and adornment. Winter houses varied but were usually a semi-subterranean structure for the Maidu groups or an interlocking pole frame structure constructed of leaning lengths of bark slab tied together for the Washoe. Summer shelters were more ephemeral typically using brush to cover a light frame.

The arrival of Euro-Americans in northeastern California brought a painful and often tragic end to the lifeways of indigenous populations. Unable to pursue seasonal foraging activities, Native Americans were often reduced to extreme poverty and, all too frequently, starvation. Some associated themselves with local Euro-American families acquiring their surnames in the process. There was also considerable inter-marriage as well. As time progressed, many found jobs and merged, at least to some extent, into Euro-American society. The atrocities that were common in California during the mid-19th century, although not absent, were actually less common in the Plumas vicinity but the losses experienced during this era were still very significant. Today, the Maidu and Washoe peoples are re-emerging from a painful past and continue to grow and embrace their respective cultural identities.

Cultural resources associated with tribal history are present within the Plumas National Forest. In addition, significant places important to indigenous people (past, present and future) have been identified through consultation but many places of special significance and/or power are, understandably, not revealed.

Euro-American History

The historic era in the northeastern portion of the Sierra Nevada Mountains begins with the California Gold Rush. There was some initial entry in the southernmost part of the Plumas National Forest in the Yuba River vicinity in 1849, but it really began in earnest with the discoveries of placer gold along the

North and Middle Forks of the Feather River in 1850. Both placer and lode/hard rock gold mining was the primary motivation for the early and rapid settlement of the region. Hydraulic mining became common in some areas of the Forest leaving behind denuded landscapes and choked stream courses. The Plumas Eureka hard rock gold mines were some of the richest in the state during the latter part of the 19th century. Two major copper mines, Engels Mine and Walker Mine, developed in Plumas County in the early 1900s, but by 1940 both were no longer active. Only small-scale or recreational placer gold mining persists today but a great many cultural resources and mining landscapes remain to testify to this extremely active period in history.

Agricultural development also began in the 1850s in the high mountain meadows and valleys. Cattle, dairying and raising hay were major industries but many settlements also maintained orchards and farms. In later years, mostly after 1900, large numbers of sheep were seasonally grazed in the mountains. Most of the lasting settlements in the area developed in agricultural areas including the Plumas County Seat of Quincy while, over time, the gold camps declined. A great many trails linked these settlements with one another and with economic centers in the Central Valley of California. Many were upgraded to wagon roads as time went by. One of the best examples of this was the Beckwourth Emigrant Trail established in 1851. In the 1890s the first common carrier railroad, the Sierra Valleys Railroad, reached into Plumas County followed not long afterward by the Boca and Loyaltown – both extending into the east end of the Forest. The Western Pacific Railroad, however, changed the social and economic status of the entire area when it was completed through the Feather River Canyon and through Eastern Plumas County in late 1909. This major railway was the last trans-continental railroad constructed in the United States.

Lumber production in the area dates back to the Gold Rush and there were many small sawmills that served local markets. With the coming of the Western Pacific Railroad many larger scale lumber and logging operations emerged exporting vast amounts of lumber products world-wide. Railroad logging was common throughout the Forest with the Clover Valley, Feather River, and Swayne Lumber Companies being among the major players in the industry. Logging operations progressed from steam power to gasoline and diesel power between the 1910s and the 1940s. Following World War II, the lumber industry continued to be very active although the logging railroads had largely (but not entirely) disappeared. Key to the progress and management of logging in the area, as well as grazing, fire management, and ultimately recreation, was the establishment of the Plumas National Forest in 1905. All of these historic themes and more are represented by the historic era cultural resources located in the Plumas National Forest.

Environmental Consequences

Alternative 1 – No Action

Direct and Indirect Effects

Under a no-action alternative, no new direct effects from OSV use would be anticipated. This alternative represents the existing baseline condition or trends by which the action alternatives are compared. Under alternative 1, there would be no changes to the existing system of OSV use on roads, snow trails, and areas within the Plumas National Forest except as prohibited by forest order. Cultural resources would continue to naturally deteriorate over time, and would continue to be threatened by natural processes (wildfire, erosion, flooding) and potentially from recreational activities that bring people in contact with cultural sites. Based on extensive site recording and monitoring data currently available, no adverse effects to cultural resources have yet been documented as a result of unregulated OSV use within the Forest. The singular exception might be OSV use near Keddie Ridge which has been identified as a place

of cultural importance to Mountain Maidu tribes and communities (not archaeological resources). The level of current OSV use in this area is poorly documented and it is unknown if such use(s) are currently resulting in extensive adverse effects to this cultural landscape but tribal consultation has indicated significant concern with even the concept such activities in this area.

Alternatives 2 - Modified, 3, and 5

Direct and Indirect Effects

Direct effects to cultural resources are those that physically alter, damage, or destroy all or part of a resource, or may alter characteristics of the surrounding environment (its setting, feeling or association) that contribute to the significance of the property. Indirect effects might occur by the introduction of visual or audible elements out of character with the property. The latter is particularly important to traditional cultural properties or other places of importance to Native Americans.

Under alternatives 2 (preferred alternative), 3 and 5, direct effects to archaeological resources would not likely occur because known sites would be covered by 12 inches or more of snow. Alternative 2 - modified (preferred alternative) and 5 eliminates an area from open OSV use on and below Keddie Peak (north of Greenville, CA, which has been identified as a place of cultural importance to Mountain Maidu tribes and other Native American interests. Alternative 1 and 3, however, retain this area for open OSV use. If one of these latter alternatives were selected, additional consultation with Indian tribes and other Native American interests would be required to assess the potential for adverse effects under Section 106 of the National Historic Preservation Act.

There are four short segments of OSV routes that do not overlie system trails or roads within the LaPorte Management Area – three segments that are part of the Wagon Wheel/Lexington Hill OSV Groomed Trail and one segment that is part of Black Rock Loop; all of which are located in the vicinity of Little Grass Valley Reservoir. A fifth segment is located about a mile west of Gold Lake in the Lakes Basin Management Area. While these short segments do not overlie system roads, all of them do overlie developed roads and/or trails, as such, use of these segments as groomed OSV trails does not have the potential to directly or indirectly affect cultural resources.

Cumulative Effects

Since alternative 2 - modified would not have direct or indirect effects on archaeological resources and would avoid sensitive areas identified by Native Americans, no cumulative effects are anticipated. Alternatives 3 and 5 would likewise not have any direct or indirect effects on archaeological resources but the potential adverse effect of open OSV use in the Keddie Ridge area is not well understood and would require additional consultation with Indian tribes and other Native American interests if one of these two alternatives were selected.

Alternative 4

Direct and Indirect Effects

This alternative allows for designated cross-country OSV areas only when there are 12 or more inches of snow or ice covering the landscape, however, no minimum depth would be designated public OSV trail use and no minimum snow depth for grooming to occur. In addition, some trails would not use or overlie already existing roads or trails. Accordingly, this alternative appears to have an increased potential to directly affect cultural resources but, again, similar to the no-action alternative, past site recording and monitoring data have not identified adverse effects to cultural resources from any unregulated OSV use within the forest.

Ongoing OSV use near Keddie Ridge, a place of cultural importance to Mountain Maidu tribes and communities, could continue. This activity could result in indirect or even direct effects to traditional cultural values in the area. The level of current OSV use in the Keddie Ridge area is not well understood and it is unknown if continued use(s) would result in adverse effects to this cultural landscape, but tribal consultation has indicated significant concern with such activities in this area.

Cumulative Effects

The cumulative effects might include increased site visitation near vulnerable cultural resources. Given the assumption of snow cover being present when OSV use occurs, the opportunity for the public to access such resources would appear to be very limited.

Compliance with LRMP and Other Relevant Laws, Regulations, Policies and Plans

Alternative 1 would not be in compliance with Subpart C of the Travel Management Rule, which requires designation of roads, trails, and areas on National Forest System lands to provide for OSV use.

Alternative 1 would result in no proposed action on the part of the Forest Service and would, therefore, not be an undertaking subject to Section 106 of the National Historic Preservation Act or under the Regional Heritage PA (2018).

Alternatives 2 - modified, 3, and 5 comply with the Region 5 Heritage PA and, by extension, with Section 106 of the National Historic Preservation Act. Snow depth criteria for cross-country use meets or exceeds the requirements within the Regional Heritage PA (appendix E, Stipulation 2.1(b)) and for the use of designated system roads/trails (appendix D, Stipulation 2.3(d)). For the few routes in the LaPorte Management Area that do not overlie system roads or trails, these have already received cultural resource inventory with negative results.

Similar to the other action alternatives, alternative 4 would comply with the Region 5 Heritage PA for cross-country OSV use, as it would still designate a 12-inch minimum snow cover for use. However, the lack of any snow depth requirement over roads and trails and/or the designation of groomed trails that do not overlie developed roads or trails would not comply with the Region 5 Heritage PA and, if roads or trails bisect cultural resource sites, then the potential for adverse effects is heightened.

In summary, by utilizing the measures outlined below for the protection of cultural resources, the Plumas National Forest, in consultation with interested parties and Indian Tribes, will have taken into account the potential effect of the proposed OSV Designation Project to historic properties. In doing so, a finding of no effect to historic properties is applicable under Section 106 of the National Historic Preservation Act and as per the Region 5 Heritage PA. Standard protection measures are as follows:

- Cross-country OSV use must have at least 12 inches depth of snow or ice throughout the duration of undertaking activities over cultural resource sites.
- Groomed trails overlaying paved, gravel or other roads with other base material serve as a cap for cultural resources that are bisected by such roads provides protection even when snow levels are under 12 inches.
- Groomed trails overlaying maintained non-surfaced designated system roads or trails that maintain 6 or more inches of snow depth are not likely to result in ground disturbance and adverse effects to cultural resources any more than use of the road/trail by vehicles, bicycles or pedestrians.
- Groomed trails that do not overlay any kind of road or trail maintained by the forest should be examined for potential adverse effect to historic properties.

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The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and other organization and individuals during the development of this environmental impact statement:

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Distribution of the Environmental Impact Statement

This environmental impact statement has been distributed to, or made electronically available to, individuals and groups who specifically requested a copy of the document or commented during public involvement opportunities. In addition, copies have been sent (or in some cases made electronically available) to Federal agencies, federally recognized tribes, State and local governments, and organizations that have requested to be involved in the development of this analysis. These individuals and organizations will be notified of the availability of the draft environmental impact statement and the 45-day comment period pursuant to 36 CFR 218.24 (a)(3).

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